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FINANCIAL STABILITY AND THE MACROECONOMY

by

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Abstract

This paper surveys the causes and macroeconomic consequences of financial instability. It emphasizes the key role of asymmetric information in causing financial instability and explores several recent instances of financial crises in industrial and emerging market countries. The paper then discusses the appropriate macroeconomic policies to reduce the risk of financial instability and to promote recovery from financial crises, if they have occurred. It argues that Central Banks should be just as concerned with financial stability as with price stability. It emphasizes that financial stability is by no means incompatible with the goal of price stability. In fact, price stability can promote financial stability since it leads to longer duration debt contracts and a sounder currency.

Keywords: Financial stability; Monetary policy

JEL: E44, E58

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1. Introduction

Although central bankers focus on price stability - indeed, they are often accused of having a fixation on price stability - they are and also should be concerned about other aspects of the macroeconomy, especially the state of the business cycle. An important fact about the business cycle is that the worst economic contractions are typically associated with severe bouts of financial instability. This paper explains how financial instability can be so devastating to the macroeconomy. A clear implication of this analysis is that financial stability should also be a central concern for central bankers and other macroeconomic policymakers.

The paper starts by first outlining an asymmetric information framework for understanding financial instability, and then shows how financial instability occurs and harms the macroeconomy. This analysis is then used to describe how financial instability has operated in recent instances in both industrialized and emerging market countries to produce severe economic contractions. The paper then goes on to look at what microeconomic policies need to be implemented to promote financial stability and to recover from financial instability. It then goes on to discuss what macroeconomic policies are needed to promote recovery of the economy after a severe bout of financial instability has occurred. The paper ends with some concluding remarks.

2. Asymmetric Information and the Definition of Financial Instability

Financial markets perform the essential function in an economy of channeling funds to those individuals or firms that have productive investment opportunities. If the financial system does not perform this role well, then the economy cannot operate efficiently and economic growth will be severely hampered. A crucial impediment to the efficient functioning of the financial system is asymmetric information, a situation in which one party to a financial contract has much less accurate information than the other party. For example, borrowers who take out loans usually have much better information about the potential returns and risk associated with the investment projects they plan to undertake than lenders do. Asymmetric information leads to two basic problems in the financial system: adverse selection and moral hazard.

Adverse selection is an asymmetric information problem that occurs before the transaction occurs when potential bad credit risks are the ones who most actively seek out a loan. Thus, the parties who are the most likely to produce an undesirable (*adverse*) outcome are most likely to be *selected*. For example, those who want to take on big risks are likely to be the most eager to take out a loan because they know that they are unlikely to pay it back. Since adverse selection makes it more likely that loans

might be made to bad credit risks, lenders may decide not to make any loans even though there are good credit risks in the marketplace. This outcome is a feature of the classic "lemons problem" analysis first described by Akerlof (1970). Clearly, minimizing the adverse selection problem requires that lenders must screen out good from bad credit risks.

Moral hazard occurs after the transaction takes place because the lender is subjected to the *hazard* that the borrower has incentives to engage in activities that are undesirable (*immoral*) from the lender's point of view: i.e., activities that make it less likely that the loan will be paid back. Moral hazard occurs because a borrower has incentives to invest in projects with high risk in which the borrower does well if the project succeeds but the lender bears most of the loss if the project fails. Also the borrower has incentives to misallocate funds for her own personal use, to shirk and just not work very hard, or to undertake investment in unprofitable projects that increase her power or stature. The conflict of interest between the borrower and lender stemming from moral hazard (the agency problem) implies that many lenders will decide that they would rather not make loans, so that lending and investment will be at sub-optimal levels.¹ In order to minimize the moral hazard problem, lenders must impose restrictions (restrictive covenants) on borrowers so that borrowers do not engage in behavior that makes it less likely that they can pay back the loan; then lenders must monitor the borrowers' activities and enforce the restrictive covenants if the borrower violates them.

In the last twenty years, there has been a growing literature that explains the institutional structure of financial markets by recognizing that this structure has evolved to reduce the asymmetric information problems of adverse selection and moral hazard described above.² However, even if the financial system is working well at a given point in time to minimize these asymmetric information problems, this may not continue in the future. Focusing on information problems leads to the following definition of financial instability.

Financial instability occurs when shocks to the financial system interfere with information flows so that the financial system can no longer do its job of channeling funds to those with productive investment opportunities.

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1. Asymmetric information is not the only source of the moral hazard problem. Moral hazard can also occur because high enforcement costs might make it too costly for the lender to prevent moral hazard even when the lender is fully informed about the borrower's activities.
 2. See Gertler (1988) and Bernanke, Gertler and Gilchrist (1998).

Indeed, if the financial instability is severe enough, it can lead to almost a complete breakdown in the functioning of financial markets, a situation that is then classified as a financial crisis.

3. Financial Instability and the Macroeconomy

Even though we now have a definition of financial instability, in order to see what policymakers can do about it, we need to understand why it occurs and how it affects the economy. The definition of financial instability above suggests that when shocks to the financial system make adverse selection and moral hazard problems worse, lending to those with productive investment opportunities dries up. Then, without access to these funds, individuals and firms cut their spending, resulting in a contraction of economic activity that can sometimes be quite severe. Four categories of factors lead to increases in asymmetric information problems and financial instability: deterioration of financial sector balance sheets, deterioration of balance sheets due to asset price changes, increases in interest rates, and increases in uncertainty.

3.1. Deterioration in Financial Sector Balance Sheets

One important feature of financial systems is the prominent role played by banking institutions and other financial intermediaries that make private loans. These financial intermediaries play such an important role because they are so well suited to reducing adverse selection and moral hazard problems in financial markets.

An important reason why asymmetric information problems are hard to eliminate in financial markets is the free-rider problem. The free-rider problem occurs because people who do not spend resources on collecting information can still take advantage of (free ride off) the information that other people have collected. For example, if some investors acquire information that tells them which securities are undervalued and then buy these securities, other investors who have not paid for this information may be able to buy right along with the well-informed investors. If enough free-riding investors can do this, the increased demand for the undervalued securities will cause their low price to be bid up to reflect the securities' full net present value given this information. As a result of all these free riders, investors who have collected information will earn less on the securities they purchase and will thus have less incentive to collect this information.

Similarly, the free-rider problem reduces the incentive for monitoring and enforcement of restrictive covenants to reduce moral hazard. Once investors recognize that other investors in securities can monitor and enforce restrictive covenants, they

will want to free ride on the other investors' monitoring and enforcement. As a result, not enough resources will be devoted to monitoring and enforcement.

Financial intermediaries, of which banks are the most important, are not as subject to the free-rider problem and profit from the information they produce because they make private loans that are not traded. Because the loans of financial intermediaries are private, other investors cannot buy them. As a result, investors are less able to free ride off financial intermediaries and bid up the prices of the loans which would prevent the intermediary from profiting from its information production activities. Similarly, it is hard to free ride off these financial intermediaries monitoring activities when they make private loans. Financial institutions making private loans thus receive the benefits of monitoring and so are better equipped to prevent moral hazard on the part of borrowers.

Banks have particular advantages over other financial intermediaries in solving asymmetric information problems. For example, banks' advantages in information collection activities are enhanced by their ability to engage in long-term customer relationships and line of credit arrangements. In addition their ability to scrutinize the checking account balances of their borrowers provides banks with an additional advantage in monitoring the borrowers' behavior. Banks also have advantages in reducing moral hazard because, as demonstrated by Diamond (1984), they can engage in lower cost monitoring than individuals, and because, as pointed out by Stiglitz and Weiss (1983), they have advantages in preventing risk taking by borrowers since they can use the threat of cutting off lending in the future to improve a borrower's behavior. Banks' natural advantages in collecting information and reducing moral hazard explain why banks have such an important role in financial markets throughout the world. Furthermore, the greater difficulty of acquiring information on private firms in emerging market countries makes banks even more important in the financial systems of these countries.³

The discussion above indicates that financial intermediaries, and particularly banks, have a very important role in financial markets since they are well suited to engage in information-producing activities that facilitate productive investment for the economy. Thus, a decline in the ability of these institutions to engage in financial intermediation and make loans will lead directly to a decline in investment and aggregate economic activity.

The state of banks' balance sheets has an important effect on bank lending. If banks suffer a deterioration in their balance sheets, and so have a substantial contrac-

3. Rojas-Suarez and Weisbrod (1994) document that banks play a more important role in the financial systems in emerging market countries than they do in industrialized countries.

tion in their capital, they have two choices: either 1) they can cut back on their lending in order to shrink their asset base and thereby restore their capital ratios, or 2) they can try to raise new capital. However, when banks experience deterioration in their balance sheets, it is very hard for them to raise new capital at a reasonable cost. Thus, the typical response of banks with weakened balance sheets is a contraction in their lending, which slows economic activity.

If the deterioration in bank balance sheets is severe enough, however, it can have even more drastic effects on bank lending if it leads to bank panics, in which there are multiple, simultaneous failures of banking institutions. Indeed, there is some possibility that, in the absence of a government safety net, contagion can spread from one bank failure to another, causing even healthy banks to fail. The source of the contagion is again asymmetric information. In a panic, depositors, fearing the safety of their deposits and not knowing the quality of the banks' loan portfolios, withdraw their deposits from the banking system, causing a contraction in loans and a multiple contraction in deposits, which then causes other banks to fail.

The disappearance of a large number of banks in a short period of time means that there is a loss of information production in financial markets and a direct loss of financial intermediation that can be done by the banking sector. The outcome is an even sharper decline in lending to facilitate productive investments, with a resulting sharp contraction in economic activity.

3.2. Deterioration in Balance Sheets Due to Asset Price Changes

The deterioration of balance sheets of both nonfinancial and financial firms due to changes in asset prices is the major source of financial instability. We describe below how the deterioration of balance sheets due to collapses in asset prices worsens both adverse selection and moral hazard problems in financial markets, thus promoting financial instability.

An important way that financial markets can solve asymmetric information problems is with the use of collateral. Collateral reduces the consequences of adverse selection or moral hazard because it reduces the lender's losses in the case of default. If a borrower defaults on a loan, the lender can take title and sell the collateral to make up for the losses on the loan. Thus, if the collateral is of good enough quality, the fact that there is asymmetric information between borrower and lender is no longer as important since the loss incurred by the lender if the loan defaults is substantially reduced.

Net worth performs a similar role to collateral. If a firm has high net worth, even if it defaults on its debt payments as a result of poor investments, the lender can take

title to the firm's net worth, sell it off, and use the proceeds to recoup some of the losses from the loan. In addition, the more net worth a firm has in the first place, the less likely it is to default because the firm has a cushion of assets that it can use to pay off its loans. High net worth also directly decreases the incentives for borrowers to commit moral hazard because borrowers now have more at stake, and thus more to lose, if they default on their loans. Hence, when firms seeking credit have high net worth, the consequences of adverse selection and moral hazard are less important and lenders will be more willing to make loans.

Declines in asset prices, both in the land and the stock market have an important role to play in promoting financial instability through the net worth effects on adverse selection and moral hazard problems described above. As emphasized by Greenwald and Stiglitz (1988), Bernanke and Gertler (1989), and Calomiris and Hubbard (1990), a sharp decline in the stock market, as in a stock market crash, can increase adverse selection and moral hazard problems in financial markets because it leads to a large decline in the market value of firms' net worth. (Note that this decline in asset values could occur either because of expectations of lower future income streams from these assets or because of a rise in market interest rates that lowers the present discounted value of future income streams.) The decline in net worth as a result of a stock market decline makes lenders less willing to lend because, as we have seen, the net worth of firms has a similar role to collateral, and when the value of collateral declines, it provides less protection to lenders so that losses from loans are likely to be more severe. In addition, the decline in corporate net worth as a result of a stock market decline increases moral hazard incentives for borrowing firms to make risky investments because these firms now have less to lose if their investments go sour. A decline in the value of land, which serves as collateral and is also an important asset in many balance sheets, has similar effects because it lowers firm net worth and directly decreases the value of collateral. Because borrowers have increased incentives to engage in moral hazard and because lenders are now less protected against the consequences of adverse selection, the declines in land and stock markets leads to decreased lending and a decline economic activity.

In economies in which inflation has been moderate, which characterizes most industrialized countries, many debt contracts are typically of fairly long duration. In this institutional environment, an unanticipated decline in inflation leads to a decrease in the net worth of firms. Debt contracts with long duration have interest payments fixed in nominal terms for a substantial period of time, with the fixed interest rate allowing for expected inflation. When inflation turns out to be less than anticipated, which can occur either because of an unanticipated disinflation as occurred in the

United States in the early 1980s or by an outright deflation as has occurred in Japan recently, the value of firms' liabilities in real terms rises so that there is an increased burden of the debt, but there is no corresponding rise in the real value of firms' assets. The result is that net worth in real terms declines. A sharp unanticipated disinflation or deflation therefore causes a substantial decline in real net worth and an increase in adverse selection and moral hazard problems facing lenders. The resulting increase in adverse selection and moral hazard problems (of the same type that were discussed in assessing the effect of net worth declines earlier) will thus also work to cause a decline in investment and economic activity.

In contrast to the industrialized countries, many emerging market countries have debt contracts are of very short duration. For example, in many emerging market countries, almost all bank lending is with variable rate contracts that are usually adjusted on a monthly basis. With this institutional framework, a decline in unanticipated inflation does not have the unfavorable direct effect on firms' balance sheets that it has in industrialized countries. The short duration of the debt contracts means that there is almost no change in the burden of the debt when inflation falls because the terms of the debt contract are continually repriced to reflect expectations of inflation. Thus, one mechanism that has played a role in industrialized countries to promote financial instability has no role in many emerging market countries.

On the other hand, there is another factor affecting balance sheets that can be extremely important in precipitating financial instability in emerging market countries that is not operational in most industrialized countries: unanticipated exchange rate depreciation or devaluation. Because of uncertainty about the future value of the domestic currency, many nonfinancial firms, banks and governments in emerging market countries find it much easier to issue debt if the debt is denominated in foreign currencies. A substantial amount of debt denominated in foreign currency was a prominent feature of the institutional structure in Chilean financial markets before its financial crisis in 1982, in Mexico in 1994 and in East Asia in 1997. With this institutional structure, unanticipated depreciation or devaluation of the domestic currency is another factor that can lead to financial instability in emerging market countries and it operates in a similar fashion to an unanticipated decline in inflation in industrialized countries. With debt contracts denominated in foreign currency, when there is an unanticipated depreciation or devaluation of the domestic currency, the debt burden of domestic firms increases. Since assets are typically denominated in domestic currency, there is a resulting deterioration in firms' balance sheets and decline in net worth, which then increases adverse selection and moral hazard problems along the lines described

above. The increase in asymmetric information problems leads to a decline in investment and economic activity.

Changes in asset prices can also have serious negative consequences on bank balance sheets, which we have seen also worsen asymmetric information problems in financial markets, thereby contributing to financial instability. We have already seen how increases in interest rates, stock market crashes, an unanticipated decline in inflation (for industrialized countries), or an unanticipated depreciation or devaluation (for emerging market countries with debt denominated in foreign currencies), can cause a deterioration in nonfinancial firms' balance sheets that reduces the likelihood of their repaying their loans. Thus, these factors can help precipitate sharp increases in loan losses that increase the probability of bank insolvency. In addition, declines in land prices, which reduce the value of collateral backing of banks' real estate loans, lead to larger losses when these loan default. Also in some countries, such as Japan, where banks hold a substantial amount of stock in corporations, a stock market decline leads to a direct negative effect on bank balance sheets.

A depreciation or devaluation of the currency in emerging market countries also leads to a deterioration in bank balance sheets because in these countries banks often raise funds with liabilities that are denominated in foreign currencies. Thus a depreciation or devaluation of the domestic currency leads to increased indebtedness, while the value of the banks' assets do not rise.⁴ The deterioration in banks' equity capital because of the changes in asset prices mentioned above can lead to substantial declines in bank lending, thereby increasing asymmetric information problems in the financial markets which lead to a decline in economic activity.

3.3. Increases in Interest Rates

As demonstrated by Stiglitz and Weiss (1981), asymmetric information and the resulting adverse selection problem can lead to credit rationing in which some borrowers are denied loans even when they are willing to pay a higher interest rate. This occurs because individuals and firms with the riskiest investment projects are exactly those who are willing to pay the highest interest rates since if the high-risk investment suc-

4. An important point is that even if banks have a matched portfolio of foreign-currency denominated assets and liabilities and so appear to avoid foreign-exchange market risk, a devaluation can nonetheless cause substantial harm to bank balance sheets. The reason is that when a devaluation occurs, the offsetting foreign-currency denominated assets are unlikely to be paid off in full because of the worsening business conditions and the negative effect that these increases in the value in domestic currency terms of these foreign-currency denominated loans have on the balance sheet of the borrowing firms. Another way of saying this is that when there is a devaluation, the mismatch between foreign-currency denominated assets and liabilities on borrowers balance sheets can lead to defaults on their loans, thereby converting a market risk for borrowers to a credit risk for the banks that have made the foreign-currency denominated loans.

ceeds, they will be the main beneficiaries. Thus, a higher interest rate leads to even greater adverse selection; that is, the higher interest rate increases the likelihood that the lender is lending to a bad credit risk. If the lender cannot discriminate among the borrowers with the riskier investment projects, it may want to cut down the number of loans it makes which causes the supply of loans to decrease with the higher interest rate, rather than increase. Thus, even if there is an excess demand for loans, a higher interest rate will not be able to equilibrate the market because additional increases in the interest rate will only decrease the supply of loans and make the excess demand for loans increase even further.

The theory behind credit rationing can be used to show that increases in interest rates can be one factor that helps precipitate financial instability. If market interest rates are driven up sufficiently, there is a higher probability that lenders will lend to bad credit risks, those with the riskiest investment projects, because good credit risks are less likely to want to borrow while bad credit risks are still willing to borrow. Because of the resulting increase in adverse selection, lenders will want to make fewer loans; possibly leading to a steep decline in lending that will lead to a substantial decline in investment and aggregate economic activity.

Increases in interest rates also play a role in promoting financial instability through both firms' and households' balance sheets. As pointed out in Bernanke and Gertler's (1995) excellent survey of the credit view of monetary transmission, a rise in interest rates and therefore in households' and firms' interest payments, decreases firms' cash flow, which causes a deterioration in their balance sheets. As a result, adverse selection and moral hazard problems become more severe for potential lenders to these firms and households, leading to a decline in lending and economic activity. There is thus an additional reason why sharp increases in interest rates can be an important factor leading to financial instability.

Increases in interest rates can also have a negative effect on bank balance sheets. Because banks often are engaged in the traditional banking business of "borrowing short and lending long," they typically have a maturity mismatch with longer duration assets than liabilities. Thus, a rise in interest rates directly causes a decline in net worth because the interest-rate rise lowers the value of assets with their longer duration more than it raises the value of liabilities with their shorter duration. Therefore, even if the credit quality of bank loans were to remain unaffected, a rise in interest rates causes a decline in net worth that then leads to a decline in bank lending.

3.4. Increases in Uncertainty

A dramatic increase in uncertainty in financial markets makes it harder for lenders to screen out good from bad credit risks. The lessened ability of lenders to solve adverse selection and moral hazard problems renders them less willing to lend, leading to a decline in lending, investment, and aggregate activity. Although this increase in uncertainty can stem from a failure of a prominent financial or nonfinancial institution or a recession, in recent episodes of financial instability in emerging market countries, uncertainty about government policies seems to have played a more prominent role.

4. Recent Episodes of Financial Instability

Now that we understand how financial instability occurs and can damage the macroeconomy, we can use our asymmetric information analysis to explain recent dramatic episodes of financial instability in Japan, Mexico and the East Asian crisis countries of Thailand, Indonesia, Malaysia, South Korea and the Philippines.⁵

There are two major institutional differences in the financial markets of industrialized countries versus emerging market countries that imply differences in how financial instability is propagated through the economy in these two types of countries. As mentioned earlier, in industrialized countries like Japan, where inflation typically has been low and not very variable, many debt contracts are of long duration. Furthermore, because these industrialized countries typically retain a strong currency, most debt contracts are denominated in the domestic currency. In contrast, many emerging market countries like Mexico and the East Asian countries, Thailand, Indonesia, Malaysia, South Korea, and the Philippines, have had often had high and variable inflation rates in the past and so long-term debt or debt denominated in domestic currency is too risky. The result has been a debt structure of very short duration, which is often denominated in foreign currency.

These two different types of institutional structures lead to somewhat different explanations of how financial instability developed and then led to an economic contraction in industrialized countries, like Japan, and emerging market countries, like Mexico or the East Asian crisis countries.⁶

5. The asymmetric information analysis we present here also applies to earlier episodes of financial crisis such as those that occurred in the United States (e.g., see Mishkin, 1991) and Chile (see Diaz-Alejandro, 1985).

6. For recent discussions of how financial instability developed in Japan, see Posen (1999) and Mishkin (1999a), in Mexico see Mishkin (1996a), and in East Asia see Goldstein (1998), Radelet and Sachs (1998), Corsetti, Pesenti and Roubini (1998), World Bank (1998) and Mishkin (1999a).

4.1. Japan

Japan began to experience financial instability and economic stagnation after the collapse of the stock and land markets with the bursting of the "bubble economy". One factor promoting financial instability was the decline in net worth of nonfinancial firms because of lower stock and bond prices increased adverse selection and moral hazard problems in financial markets because the effective collateral in the firms had decreased. In addition, the decline in net worth meant that the incentives for borrowers to take on risk at the expense of the lender had increased. The result of the decline in net worth was thus an increase in asymmetric information problems, which led to a contraction in lending and output in the Japanese economy. One of the results of the decline has been economic stagnation for nearly ten years.

As we have seen, banks have a very important role in financial markets since they are well suited to engage in information-producing activities that facilitate productive investment for the economy. Thus, a decline in the ability of banks to engage in financial intermediation and make loans caused by a deterioration in bank balance sheets as happened in Japan led directly to a decline in investment and aggregate economic activity.

Negative shocks to banks' balance sheets in Japan took two three basic forms. First, because Japanese banks hold a substantial amount of equities, declines in the stock market have had a direct negative impact on Japanese bank balance sheets. Second, we have already seen how stock market and land market crashes can cause a deterioration in nonfinancial firms' balance sheets that reduces the likelihood of their repaying their loans. Thus, these factors can help precipitate sharp increases in loan losses that increase the probability of bank insolvency. Third, weak bank balance sheets can also occur because the supervisory/regulatory structure has not worked well enough to restrain excessive risk-taking on the part of banks.

With the liberalization of Japanese financial markets in the 1980s, Japanese banks suddenly found themselves in a more competitive environment. In an attempt to maintain adequate profit levels, a natural response was to take on riskier loans with high profit margins.⁷ The incentives to do this were enhanced by the presence of a government safety net, which protected depositors and even large creditors if these risky loans turned sour and led to bank insolvencies. Knowing that the government would come to the rescue meant that depositors and other creditors had little incentive to monitor the banks and prevent them from taking on too much risk. The result was a well-known moral hazard problem in which the Japanese banks had increased incen-

7. A similar phenomenon has occurred in the United States and in other countries. See Edwards and Mishkin (1995).

tives to increase their risk exposure and this is exactly what they did, especially in their lending to the real estate sector. In order to prevent this from occurring, Japanese banking supervisors had to monitor banks closely and prevent them from engaging in excessive risk-taking. However, this did not happen.

An important reason why the regulatory/supervisory process did not work well is explained by recognizing that the relationship between the voters-taxpayers, on the one hand, and the regulators and politicians, on the other, creates a particular type of moral hazard problem, the principal-agent problem. The principal-agent problem occurs when agents have different incentives from the person they work for (the principal) and so act in their own interest rather than in the interest of their employer. Regulators and politicians are ultimately agents for voters-taxpayers (principals) because in the final analysis taxpayers bear the cost of any losses when the safety net is invoked. The principal-agent problem occurs because the agent (a politician or regulator) may not have the same incentives to minimize costs to the economy as the principal (the taxpayer).

To act in the taxpayer's interest, regulators/supervisors have several tasks. In order to restrict excessive risk-taking they must set restrictions on holding assets that are too risky, impose sufficiently high capital requirements, and close down insolvent institutions. However, because of the principal-agent problem, regulators have incentives to do the opposite and engage in regulatory forbearance, in which they forego the right to enforce regulations or close down insolvent institutions. One important incentive for regulators that explains this phenomenon is their desire to escape blame for poor performance of their agency. By loosening capital requirements and pursuing regulatory forbearance, regulators can hide the problem of an insolvent bank and hope that the situation will improve. Kane (1989) characterizes such behavior on the part of regulators as "bureaucratic gambling". Another important incentive for regulators is that they may want to protect their careers by acceding to pressures from politicians. The failures of the Ministry of Finance to properly regulate and supervise Japanese banks in recent years is an excellent example of the principal-agent problem at work, and the result has been huge loan losses in the banking sector, which now exceed \$500 billion.⁸

As we have seen above, a deterioration in banks' balance sheets leads to a decline in lending and in economic activity. Research in the United States, suggests, for example, that this mechanism was operational during the early 1990s in the United States

8. This principal-agent problem was also extremely important in producing the savings and loan debacle in the United States (e.g., see Kane, 1989).

when the capital crunch led to the headwinds which hindered growth in the U.S. economy at that time.⁹ We are seeing a similar phenomenon in recent years in Japan.

Another source of financial instability in Japan has been deflation, which led to a decrease in the net worth of firms because debt contracts are denominated in domestic currency and are typically of fairly long duration. Deflation led to a rise in the value of firms' liabilities in real terms so that there was an increased burden of the debt, with the result that it caused a further decline in real net worth and an increase in adverse selection and moral hazard problems facing lenders. The resulting increase in adverse selection and moral hazard problems described earlier thus also worked to cause a decline in investment and economic activity. The deflation that has occurred in recent years in Japan, although not nearly as severe as that which occurred during the Great Depression in the United States in the 1930s, has thus helped prolong the malaise in the economy.

4.2. Mexico and the East Asia Crisis Countries

Consistent with the Japanese experience, stock market declines and increases in uncertainty were factors precipitating the full-blown crises in Mexico, Thailand and South Korea. (The stock market declines in Malaysia, Indonesia and the Philippines occurred simultaneously with the onset of the crisis.) The Mexican economy was hit by political shocks in 1994 that created uncertainty, specifically the assassination of Luis Donaldo Colosio, the ruling party's presidential candidate, and an uprising in the southern state of Chiapas. By the middle of December 1994, stock prices on the Bolsa (stock exchange) had fallen nearly 20% from their September 1994 peak. In January 1997, a major Korean chaebol (conglomerate), Hanbo Steel, collapsed; it was the first bankruptcy of a chaebol in a decade. Shortly thereafter, Sammi Steel and Kia Motors also declared bankruptcy. In Thailand, Samprosong Land, a major real estate developer, defaulted on its foreign debt in early February 1997, and financial institutions that had lent heavily in the real estate market began to encounter serious difficulties, requiring over \$8 billion of loans from the Thai central bank to prop them up. Finally, in June, the failure of a major Thai finance company, Finance One, imposed substantial losses on both domestic and foreign creditors. These events increased general uncertainty in the financial markets of Thailand and South Korea, and both experienced substantial declines in their securities markets. From peak values in early 1996, Korean stock prices fell by 25% and Thai stock prices fell by 50%.

9. For example, see Bernanke and Lown (1991), Berger and Udell (1994), Hancock, Laing and Wilcox (1995) and Peek and Rosengren (1995) and the symposium published in the Federal Reserve Bank of New York Quarterly Review in the spring of 1993, Federal Reserve Bank of New York (1993).

As we have seen, an increase in uncertainty and a decrease in net worth as a result of a stock market decline increase asymmetric information problems. It becomes harder to screen out good from bad borrowers, and the decline in net worth decreases the value of firms' collateral and increases their incentives to make risky investments because there is less equity to lose if the investments are unsuccessful. The increase in uncertainty and stock market declines that occurred before the crisis, along with the deterioration in banks' balance sheets, worsened adverse selection and moral hazard problems and made the economies ripe for a serious financial crisis.

Another precipitating factor to the Mexican (but not East Asian) financial crisis was a rise in interest rates abroad. Beginning in February 1994, the Federal Reserve began to raise the federal funds rate to head off inflationary pressures. Although the policy was quite successful in keeping inflation in check in the United States, it put upward pressure on Mexican interest rates, thereby increasing asymmetric information problems in the Mexican financial system. Furthermore, the Mexican central bank, the Banco de Mexico, raised interest rates to protect the value of the peso in the foreign exchange market. The rise in interest rates directly added to increased adverse selection in Mexican financial markets because, as discussed earlier, it made it more likely that the parties willing to take on the most risk would seek loans.

Probably the most important factor behind the financial crises in Mexico and East Asia was the financial liberalization in these countries that resulted in the lending boom, which was fed by capital inflows. Once restrictions were lifted on both interest-rate ceilings and the type of lending allowed, lending increased dramatically. The problem with the resulting lending boom was not that lending expanded, but that it expanded so rapidly that excessive risk-taking was the result, with large losses on loans in the future.

There are two reasons why excessive risk-taking occurred after the financial liberalization in Mexico and the East Asian crisis countries. The first is that managers of banking and other similar financial institutions often lacked the expertise to manage risk appropriately when new lending opportunities opened up after financial liberalization. In addition, with rapid growth of lending, banking institutions could not add the necessary managerial capital (well-trained loan officers, risk-assessment systems, etc.) fast enough to enable these institutions to screen and monitor these new loans appropriately.

The second reason why excessive risk-taking occurred was the inadequacy of the regulatory/supervisory system as in Japan. Mexico and the crisis countries in East Asia were notorious for weak financial regulation and supervision. (In contrast, the noncrisis countries in East Asia, Singapore, Hong Kong and Taiwan had very strong pru-

dential supervision.) When financial liberalization yielded new opportunities to take on risk, these weak regulatory/supervisory systems could not limit the moral hazard created by the government safety net and excessive risk-taking is the result. This problem was made even more severe by the rapid credit growth in a lending boom, which stretched the resources of the bank supervisors. Bank supervisory agencies were also unable to add to their supervisory capital (well-trained examiners and information systems) fast enough to enable them to keep up with their increased responsibilities both because they had to monitor new activities of the banks, but also because these activities were expanding at a rapid pace.

Capital inflows made this problem even worse. Once financial liberalization is adopted, foreign capital flew into banks in these emerging market countries because it earned high yields but was likely to be protected by the government safety net, whether it was going to be provided by the government of the emerging market country or by international agencies such as the IMF. The result was that capital inflows fueled a lending boom, which led to excessive risk-taking on the part of banks. The capital inflow problem was further stimulated by exchange-rate pegs, which, by providing a more stable value of the currency, might have given foreign investors a sense of lower risk.¹⁰ In Mexico and East Asia capital inflows averaged from 5 to over 10% of GDP in the three years leading up to the crisis. Folkerts-Landau, et. al (1995), for example, found that emerging market countries in the Asian-Pacific region with large net private capital inflows also experienced large increases in their banking sectors.

There are two ways in which the lending boom arising after financial liberalization led to the financial crises in Mexico and East Asia. First, the excessive risk-taking led to substantial loan losses before the crisis: as mentioned in Mishkin (1997) and Goldstein (1998), Indonesia, South Korea and Thailand all had nonperforming loans that exceeded 10% of total lending, while the Philippines, Malaysia and Mexico had nonperforming loans between 5 and 10% of total lending. Indeed, these figures are likely to be substantially understated because accounting principles for nonperforming loans in emerging market countries are far more lax than in the United States. Once the resulting deterioration in the balance sheets of banking firms became apparent, they were forced to restrict their lending in order to improve their capital ratios.

Second, the deterioration in bank balance sheets promoted a currency crisis because it became very difficult for the central bank to defend its currency against a speculative attack. As was mentioned earlier, any rise in interest rates to keep the

10. The encouragement of capital inflows that lead to excessive risk-taking resulting from exchange-rate pegs suggests one reason why using exchange-rate pegs for stabilization purposes in emerging market countries may be highly problematic. See Mishkin (1998).

domestic currency from depreciating has the additional effect of weakening the banking system further because the rise in interest rates hurts banks' balance sheets. This negative effect of a rise in interest rates on banks' balance sheets occurs because of their maturity mismatch and their exposure to increased credit risk when the economy deteriorates. Thus, when a speculative attack on the currency occurs in an emerging market country, if the central bank raises interest rates sufficiently to defend the currency, the banking system may collapse. Once investors recognize that a country's weak banking system makes it less likely that the central bank will take the steps to successfully defend the domestic currency, they have even greater incentives to attack the currency because expected profits from selling the currency have now risen. Thus, with a weakened banking sector, a successful speculative attack is likely to materialize.¹¹

The weakened state of the banking sector along with the high degree of illiquidity in Mexico and East Asian countries before the crisis, then set the stage for the currency crisis. With these vulnerabilities, speculative attacks on the currency could have been triggered by any of many factors, a large current account being just one of them. In the Mexican case, the attacks came in the wake of political instability, such as the assassination of political candidates and an uprising in Chiapas. Even though the Mexican central bank intervened in the foreign exchange market and raised interest rates sharply, it was unable to stem the attack and was forced to devalue the peso on December 20, 1994. In the case of Thailand, the attacks followed unsuccessful attempts of the government to shore up the financial system, culminating in the failure of Finance One, a large finance company, in June 1997. Eventually, the inability of the central bank to defend the currency because the required measures would do too much harm to the weakened financial sector meant that the attacks could not be resisted. The outcome was a successful speculative attack that forced the Thai central bank to allow the baht to float downward. Soon thereafter, speculative attacks developed against the other countries in the region, leading to the collapse of the Philippine peso, the Indonesian rupiah, the Malaysian ringgit, and the South Korean won.

The currency crises in Mexico and East Asia helped trigger the next stage of financial instability, a full-fledged financial crisis. The institutional structure of debt markets in Mexico and East Asia now interacted with the currency devaluations to increase asymmetric information problems in credit markets, and so led to the finan-

11. As pointed out in Burnside, Eichenbaum and Rebelo (1998), an additional reason why the problems in the banking sector can trigger a currency crisis is that the cost of bailing out the insolvent banking sector could produce substantial fiscal deficits in the future. Even though their story involves fiscal deficits, from a policy perspective, it leads to the same conclusion that it was not poor macroeconomic policies that lead to the crises, but rather poor micro policies in the financial sector.

cial crises. Because so many firms in these countries had debt denominated in foreign currencies like the dollar and the yen, depreciation of their currencies resulted in increases in their indebtedness in domestic currency terms, even though the value of their assets remained unchanged. When the peso lost half its value by March 1995 and the Thai, Philippine, Malaysian, and South Korean currencies lost between a third and half of their value by the beginning of 1998, firms' balance sheets took a big negative hit, which caused a dramatic increase in adverse selection and moral hazard problems. This negative shock was most severe for Indonesia, which saw the value of its currency fall by an astronomical 80%, resulting in insolvency for any firm with substantial amounts of debt denominated in foreign currencies.

The collapse of currencies also led to a rise in actual and expected inflation in two of the countries; Mexico and Indonesia, where inflation rates climbed to over 50%. (Thailand, Malaysia and South Korea have avoided a large rise in inflation, which partially explains their better performance relative to Indonesia.) The rise in expected inflation after the currency crises in Mexico and Indonesia led to a sharp rise in interest rates which, given the short-duration of debt, led to huge increases in interest payments by firms. As noted before, a feature of debt markets in emerging-market countries, like those in Mexico and Indonesia, is that debt contracts have very short durations, typically less than one month. Thus the rise in short-term interest rates in these countries meant that the effect on cash flow and hence on balance sheets was substantial. As our asymmetric information analysis suggests this deterioration in households' and firms' balance sheets increased adverse selection and moral hazard problems in the credit markets, making lenders even less willing to lend.

These asymmetric information problems were severe not only for domestic lenders but for foreign lenders as well because they had difficulty obtaining information regarding these economies. Foreign lenders were thus eager to pull their funds out of Mexico and the East Asian crisis countries, and that is what they did. Foreign portfolio investment inflows to Mexico, which had been on the order of \$20 billion a year in 1993, reversed course, and the outflows exceeded \$10 billion a year by the fourth quarter of 1994. Similarly in East Asia, capital flows for Thailand, Malaysia, the Philippines, Indonesia, and South Korea reversed from an inflow of close to \$100 billion in 1996 to an outflow of more than \$10 billion in 1997. Consistent with the theory of financial crises outlined in this chapter, the sharp decline in lending helped lead to a collapse of economic activity, with real GDP growth falling sharply.

Further deterioration in the economy occurred because the collapse in economic activity and the deterioration in the cash flow and balance sheets of both firms and households led to a worsening banking crisis. The problems of firms and households

meant that many of them were no longer able to pay off their debts, resulting in substantial losses for the banks. Even more problematic for the banks was that they had many short-term liabilities denominated in foreign currencies, and the sharp increase in the value of these liabilities after the devaluation led to a further deterioration in the banks' balance sheets. Under these circumstances, the banking system would have collapsed in the absence of a government safety net - as it did in the United States during the Great Depression, but with the assistance of the International Monetary Fund, these countries were in some cases able to protect depositors and avoid a bank panic. However, given the loss of bank capital and the need for the government to intervene to prop up the banks, the banks' ability to lend was nevertheless sharply curtailed. In the case of Indonesia, a bank panic did occur, forcing banks to go out of business, making the decline in lending and the financial crisis even worse. As we have seen, the reduction in bank lending makes adverse selection and moral hazard problems worse in financial markets because banks are less capable of playing their traditional financial intermediation role. The banking crisis, along with other factors that increased adverse selection and moral hazard problems in the credit markets of Mexico and East Asia, explains the collapse of lending and hence economic activity in the aftermath of the crisis.

5. Microeconomic Policies to Prevent Financial Instability

The asymmetric information analysis of the relationship between financial instability and the macroeconomy is not only of academic interest but also has many important lessons for policymakers, particularly those in central banks. Here we focus on domestic microeconomic policies that help prevent financial instability, and in the next two sections examine domestic policies that help promote recovery from bouts of financial instability. There are additional implications of the analysis here for international financial architecture, specifically, what should be the choice of exchange rate regime, whether capital liberalization or controls are appropriate and what should be the role of the International Monetary Fund in crisis management, but because of space limitations these are better left to discussion elsewhere (e.g., see Mishkin, 1999a and forthcoming, and Eichengreen, 1999).

There are two basic categories of microeconomic policies to prevent financial instability that we examine here: regulation and supervision of the financial system and how financial liberalization should be managed. Only a brief description of the policies in these categories is discussed here. A more detailed discussion can be found in Mishkin (forthcoming).

5.1. Regulation and Supervision of the Financial System

As we have seen, financial institutions, particularly banks, play a particularly important role in the financial systems of both industrialized and particularly emerging market and transition countries' financial systems, and thus problems in the financial sector are a particularly important source of financial instability. Indeed, we have seen that deterioration in financial firms' balance sheets is an important precursor of financial crises, especially in emerging market countries. There, problems in the financial and particularly in the banking sector can make a foreign exchange crisis more likely, which in turn leads to a full blown financial crisis. Our asymmetric information framework suggests that there is an important need for a government safety net for the banking system in order to prevent bank panics. However, a safety net nonetheless increases the moral hazard incentives for excessive risk-taking on the part of the banks. All governments therefore need to pay particular attention to creating and sustaining a strong bank regulatory/supervisory system to reduce excessive risk-taking in their financial systems.

Encouraging a strong bank regulatory/supervisory system takes ten basic forms:

1. Adequate Resources and Statutory Authority for Bank Regulators/Supervisors

Bank regulatory/supervisory agencies need to be provided with adequate resources and the statutory authority (the ability to issue cease and desist orders and to close down insolvent banks) to do their job effectively. Without these resources, the bank supervisory agency will not be able to monitor banks sufficiently in order to keep them from engaging in inappropriately risky activities, to have the appropriate management expertise and controls to manage risk, or to have sufficient capital so that moral hazard incentives to take on excessive risk are kept in check. Indeed, this inability to monitor banking institutions sufficiently not surprisingly has occurred in many emerging market and transition countries (Mexico and East Asia being recent examples), but it has also been a very serious problem in industrialized countries. The resistance to providing the savings and loan supervisory agencies with adequate resources to hire sufficient bank examiners by the U.S. Congress was a key factor in making the S&L crisis in the United States in the 1980s much worse. The inadequacy of bank supervision in Japan and the problems it has caused are well-known, with the lack of resources for bank supervision exemplified by the fact that the number of bank examiners in Japan is on the order of 400 in contrast to around 7,000 in the United States.

2. Prompt Corrective Action

Prompt corrective action by bank supervisors will stop undesirable bank activities and, even more importantly, not only close down institutions that do not have sufficient net worth, but also make sure that stockholders and managers of insolvent institutions are appropriately punished. Prompt corrective action is particularly important in part because it immediately prevents banks from "betting the bank" in order to restore the value of the institution, and in part because it creates incentives for banks not to take on too much risk in the first place, knowing that if they do so, they are more likely to be punished.

3. Focus on Risk Management

The traditional approach to bank supervision has focused on the quality of the bank's balance sheet at a point in time and whether the bank complies with capital requirements. Although the traditional focus is important for reducing excessive risk-taking by banks, it may no longer be adequate. First is the point that capital may be extremely hard to measure. Furthermore, in today's world, financial innovation has produced new markets and instruments, which make it easy for banks and their employees to make huge bets quickly. In this new financial environment, a bank that is quite healthy at a particular point in time can be driven into insolvency extremely rapidly from trading losses, as has been forcefully demonstrated by the failure of Barings in 1995 which, although initially well capitalized, was brought down by a rogue trader in a matter of months. Thus an examination which focuses only on a bank's position at a point in time may not be effective in indicating whether a bank will in fact be taking on excessive risk in the near future. As a result, bank examiners now need to place far greater emphasis on evaluating the soundness of bank's management processes with regard to controlling risk. Bank examiners need to make sure that best practice in risk management spreads throughout the banking industry by forcing banks with poor risk management procedures to get them up to speed.

4. Entry of Foreign Banks

Many countries have restrictions on the entry of foreign banks. Rather than seeing foreign banks as a threat, their entry should be seen as an opportunity to strengthen the banking system. In all but a few large countries, domestic banks are unable to diversify because their lending is concentrated in the home country. In contrast, foreign banks have more diversified portfolios and also usually have access to sources of funds from all over the world through their parent company. This diversification means that these foreign banks are exposed to less risk and are less affected by negative shocks to the

home country's economy and encouraging entry of foreign banks is thus likely to lead to a banking and financial system that is substantially less fragile and far less prone to crisis. In addition, encouraging entry of foreign banks can encourage adoption of best practice in the banking industry because when bank examiners in a country see better practices in risk management, they can ensure their spread.

5. Independence of the Bank Regulatory/Supervisory Agency

Because prompt corrective action is so important, the bank regulatory/supervisory agency needs sufficient independence from the political process so that it is not encouraged to sweep problems under the rug and engage in regulatory forbearance. One way to ensure against regulatory forbearance is to give the bank supervisory role to a politically independent central bank. This has desirable elements as pointed out in Mishkin (1992), but some central banks might not want to have the supervisory task thrust upon them because they worry that it might increase the likelihood that the central bank would be politicized, thereby impinging on the independence of the central bank. Alternatively, bank supervisory activities could be housed in a bank regulatory authority that is independent of the government.

6. Accountability of Bank Supervisors

It is also important to make bank supervisors accountable if they engage in regulatory forbearance in order to improve incentives for them to do their job properly. For example, as pointed out in Mishkin (1997), an important but very often overlooked part of FDICIA which has helped make this legislation effective is that there is a mandatory report that the supervisory agencies must produce if the bank failure imposes costs on the Federal Deposit Insurance Corporation (FDIC). The resulting report is made available to any member of Congress and to the general public upon request, and the General Accounting Office must do an annual review of these reports. Opening up the actions of bank supervisors to public scrutiny makes regulatory forbearance less attractive to them, thereby reducing the principal-agent problem. In addition, subjecting the actions of bank supervisors to public scrutiny reduces the incentives of politicians to lean on supervisors to relax their supervision of banks.

7. Limiting Too-Big-To-Fail

Because the failure of a very large bank makes it more likely that a major, systemic financial disruption will occur, bank supervisors are naturally reluctant to allow a big bank to fail and cause losses to depositors. The result is that most countries either explicitly or implicitly have a too-big-to-fail policy in which all depositors at a big

bank, both insured and uninsured are fully protected if the bank fails. The problem with the too-big-to-fail policy is that it reduces market discipline on big banks and thus increases their moral hazard incentives to take on excessive risk.¹² Dealing with the quandary of not wanting to allow a large bank failure to destabilize the financial system, while keeping the moral hazard problem created by a too-big-to-fail policy under control is indeed a difficult one, and requires careful thought and attention by bank regulators and supervisors. Elsewhere I have outlined a proposal for how to cope with this quandary (Mishkin, 1999b), and it is well beyond the scope of this paper to go into this topic in detail.

8. Accounting and Disclosure Requirements

Accounting and disclosure requirements for financial institutions, which are often particularly lacking in emerging market countries, but in a number of industrialized countries as well, need to be beefed up considerably. Without the appropriate information, both markets and bank and other financial institution supervisors will not be able to adequately monitor the banks to deter excessive risk-taking.¹³ In addition, adequate accounting and disclosure requirements are necessary if the market is to have enough information to monitor financial institutions so that they can prevent excessive risk taking. Proper accounting standards and disclosure requirements are therefore crucial to both market-based and supervisory discipline that can help prevent financial instability.

9. Restrictions on Connected Lending

A particular problem in the banking sector, particularly in emerging market and transition countries, is connected lending, lending to banks' owners or managers or their business associates. Banks clearly have less incentives to monitor loans to their owners or managers, thus increasing the moral hazard incentives for the borrowers to take on excessive risk, thereby exposing the bank to potential loan losses. In addition, connected lending in which large loans are made to one party can result in a lack of diversification for the bank, thus increasing the risk exposure of the bank. Regulations against connected lending are clearly necessary to reduce banks risk exposure in order to prevent financial instability.

12. Evidence that this occurred in the United States is found in Boyd and Gertler (1993).

13. The importance of disclosure is illustrated in a recent paper by Garber and Lall (1996), which suggests that off balance-sheet and off-shore derivatives contracts played an important role in the Mexican crisis.

10. Legal and Judicial Systems

The legal and judicial systems are very important for promoting the efficient functioning of the financial system and the inadequacies of legal systems in many countries are a serious problem for financial markets. If property rights are unclear or hard to enforce, the process of financial intermediation can be severely hampered. Collateral can be an effective mechanism to reduce adverse selection and moral hazard problems in credit markets because it reduces the system prevents the use of certain assets as collateral or makes attaching collateral a costly and time-consuming process, thereby reducing the effectiveness of collateral to solve asymmetric information problems.¹⁴ Similarly, bankruptcy procedures in developing countries are frequently very cumbersome (or even nonexistent), resulting in lengthy delays in resolving conflicting claims. Resolution of bankruptcies in which the books of insolvent firms are opened up and assets are redistributed can be viewed as a process to decrease asymmetric information in the marketplace. Furthermore, slow resolution of bankruptcies can delay recovery from a financial crisis because only when bankruptcies have been resolved is there enough information in the financial system to restore it to a healthy operation.

5.2. Financial Liberalization

Deregulation and liberalization of the financial system have swept through almost all countries in recent years. Although deregulation and liberalization are highly desirable objectives, the asymmetric information framework in this paper indicates that if this process is not managed properly, it can be disastrous. If the proper bank regulatory/supervisory structure, accounting and disclosure requirements, restrictions on connected lending, and well-functioning legal and judicial systems are not in place when liberalization comes, the appropriate constraints on risk-taking behavior will be far too weak. The result will be that bad loans are likely, with potentially disastrous consequences for bank balance sheets at some point in the future.

In addition, before liberalization occurs, banks may not have the expertise to make loans wisely, and so opening them up to new lending opportunities may also lead to poor quality of the loan portfolio. We have also seen that financial deregulation and liberalization often lead to a lending boom, because of both increased opportunities for bank lending and financial deepening in which more funds flow into the banking system. Although financial deepening is a positive development for the economy in the

14. For example, see Rojas-Suarez and Weisbrod (1994).

long run, in the short run the lending boom may outstrip the available information resources in the financial system, helping to promote a financial collapse in the future.

The dangers in financial deregulation and liberalization do not mean that countries should not pursue a liberalization strategy. To the contrary, financial liberalization is critical to the efficient functioning of financial markets so that they can channel funds to those with the most productive investment opportunities. Getting funds to those with the most productive investment opportunities is especially critical to emerging market countries because these investments can have especially high returns, thereby stimulating rapid economic growth. However, proper sequencing of financial deregulation and liberalization is critical to its success. It is important that policymakers put in place the proper institutional structure before liberalizing their financial systems, especially if there are no restrictions on financial institutions seeking funds abroad or issuing foreign-denominated debt. Before financial markets are fully liberalized, it is crucial that the precepts outlined above be implemented: provision of sufficient resources and statutory authority to bank supervisors, adoption of prompt corrective action provisions, an appropriate focus on risk management, independence of bank regulators/supervisors from short-run political pressure, increased accountability of bank supervisors, limitations on too-big-to-fail, adoption of adequate accounting standards and disclosure requirements, sufficient restrictions on connected lending, improvements in the legal and judicial systems, and encouragement of entry of foreign banks.

Because the above measures are not easy to install quickly and because of the stresses that rapid expansion of the financial sector puts on both managerial and supervisory resources, policymakers probably need to restrict the growth of credit when financial liberalization is put into place. This can take the form of putting upper limits on loan-to-value ratios, or for consumer credit, setting maximum repayment periods and minimum downpayment percentages. Banks could also be restricted in how fast certain types of their loan portfolios are allowed to grow. As the appropriate infrastructure is put into place, these restrictions could and should be reduced. The bottom line is that, although eventually a full financial liberalization should be the goal, financial liberalization needs to proceed at a measured pace, with some restrictions imposed along the way.

6. Microeconomic Policies to Promote Recovery from Financial Instability

We have already seen that weak balance sheets in financial firms such as banks cause them to restrict their lending activities, which leads to worse asymmetric information problems in financial markets, and is thus a severe drag on the economy. A key element in restoring both the financial system and the economy back to health is a recapitalization of the financial sector. Financial institutions cannot raise new capital when the economy is undergoing a bout of financial instability because private capital does not gravitate to institutions in financial distress. Thus to restore the financial system back to health, the government must step in quickly to provide funds to recapitalize these institutions.

However, just supplying capital to financial institutions is not sufficient to restore confidence and restart the financial system, it must be done in the right way. Confidence will only be restored if markets believe that financial institutions will not continue taking excessive risk. Thus the moral hazard created by the safety net and the recapitalization of the financial sector must be limited by the measures that we have discussed in the previous section to improve the regulation and supervision of the financial system. Indeed, starting a process to implement these measures is an important strategy to help promote recovery from financial instability. In addition, funds must not be supplied to weak or insolvent banking institutions to keep them afloat. To do so will just be throwing away good taxpayer money after bad. In the long-run, injecting public funds into weak banks does not deliver a restoration of the balance sheets of the banking system because these weak banks continue to be weak and have strong moral hazard incentives to take on big risks at the taxpayers' expense because they have little to lose if their bets go wrong. The way to recapitalize the banking system is to close down all insolvent and weak institutions and sell off their assets to healthy institutions with public funds used to make the assets whole. If this is not possible, the assets of these closed banks must be sold off as promptly as possible, so that the assets can be quickly put to productive uses by the private sector. Only when the banking system is fully recapitalized and unhealthy banks put out of their misery, can sustained recovery begin.

7. Macroeconomic Policies to Promote Recovery from Financial Instability

Our discussion of financial instability and the macroeconomy indicates that there is a crucial difference in the structure of debt markets that results in a different propagation of financial instability in emerging market versus industrialized countries: In industrialized countries debt contracts are generally denominated in domestic currency and are often long term, while in emerging market countries the opposite is the case - debt is often denominated in foreign currency and is always short-term. The implication of our asymmetric information analysis is thus that very different macroeconomic policies are needed to promote recovery from financial instability in emerging market versus industrialized countries. Indeed what are appropriate policies for industrialized countries are exactly the wrong medicine for emerging market countries.

7.1. Industrialized Countries

We have already seen that destruction of balance sheets is the key factor that produces financial instability. Thus the asymmetric information analysis of financial instability presented here indicates that macroeconomic policies to promote recovery must focus on restoring balance sheets to health. With the institutional structure of debt markets in industrialized countries, expansionary monetary policy that injects liquidity (reserves) into the financial system is the most direct way to restore balance sheets. Injecting reserves, either through open market operations or by lending to the banking sector, causes the money supply to increase, which in turns leads to a higher price level. Given that debt contracts are denominated in domestic currency and many debt contracts are of fairly long duration, the higher price level produces the opposite of the unanticipated disinflation mechanism described earlier. The reflation of the economy causes the debt burden of households and firms to fall, thereby increasing their net worth. As outlined earlier, higher net worth then leads to reduced adverse selection and moral hazard problems in financial markets, undoing the increase in adverse selection and moral hazard problems induced by the financial crisis. In addition, injecting liquidity into the economy raises asset prices such as land and stock market values, which also cause an improvement in net worth and a reduction in adverse selection and moral hazard problems. Also, expansionary monetary policy promotes economic recovery through other mechanisms involving the stock market and the foreign exchange market.¹⁵

A common fallacy is that monetary policy is ineffective if interest rates are close to zero, as has been recently true in Japan, and thus expansionary monetary policy

might not be able to promote recovery. A deeper understanding of the transmission mechanisms of monetary policy (e.g., see Mishkin, 1996a) and careful study of the Great Depression era in the United States when interest rates were also near zero (Friedman and Schwartz, 1963, and Romer, 1992) indicates that this view is just plain wrong.¹⁶ Expansionary monetary policy to increase liquidity in the economy can be achieved with open market purchases, which do not have to be solely in short-term domestic government securities. Unsterilized purchases of foreign exchange can also do the trick. Even with interest rates at zero, expansionary monetary policy lifts the prices of assets, such as land and equities, which lead to increases in aggregate demand, while it also leads to currency depreciation which also increases aggregate demand because it stimulates net exports. In addition, the resulting increase in asset values directly improves balance sheets of financial and nonfinancial firms. Expansionary monetary policy also helps stimulate the economy by raising the general price level, which, has direct beneficial effects on balance sheets because it leads to a reduction in the real indebtedness of firms as explained above.

Expansionary fiscal policy is another way to promote recovery from financial instability by stimulating aggregate demand. Stimulating aggregate demand in this way can help restore balance sheets because it makes it easier for firms to sell their goods, which not only improves their balance sheets, but makes it more likely that they can pay back their loans, thereby leading to an improvement in the balance sheets of financial institutions as well. Expansionary fiscal policy has three disadvantages relative to expansionary monetary policy as a method to recover from financial instability. First, expansionary fiscal policy has the undesirable side effect of increasing future government indebtedness. This can be highly problematic in situations such as the one the Japanese are facing in which the aging of the Japanese population means that future pension obligations will be huge, suggesting severe stress on Japanese government finances in the future. Second, expansionary fiscal policy can take a substantial amount of time to implement. Third, because monetary policy probably has more direct effects on the price level, especially through its impact on inflation expectations,

15. See Mishkin (1996). Note that not all industrialized countries are alike in their ability to use expansionary monetary policy to recover from a financial crisis. If a country has a commitment to peg its exchange rate to a foreign currency, then expansionary monetary policy may not be an available tool to promote recovery because pursuing such a policy might force a devaluation of its currency. This problem is of course particularly acute for a small country in a pegged exchange rate regime. Even if a country has a flexible exchange rate, expansionary monetary policy to promote recovery might cause a depreciation of the domestic currency which is considered to be intolerable by the authorities, particularly in smaller countries. Clearly, a large reserve currency country like the United States has the most flexibility to use expansionary monetary policy to reflate the economy as a tool to recover from or reduce the probability of a financial crisis.

16. Also see Krugman (1999).

it is likely to be able to raise the price level more rapidly, which has the direct positive effects on balance sheets that we have described above.

A second method for a central bank to promote recovery from a financial crisis is to pursue the so-called lender-of-last-resort role in which the central bank stands ready to lend freely during a financial crisis. The lender of last resort can prevent financial instability from growing into a full-scale financial crisis by providing funds to illiquid, but solvent financial institutions, which would otherwise go out of business without the support of the central bank. The lender-of-last-resort operation is thus able to stop contagion from spreading from one financial institution to others. The lender of last resort can also provide liquidity to financial institutions so that they do not have to pull back lending during a crisis.

An important historical feature of successful lender of last resort operations is that the faster the lending is done, the lower is the amount that actually has to be lent. This fact provides support for the second principle that the faster liquidity is provided in an international lender of last resort operation, the better. An excellent example occurred in the aftermath of the stock market crash on October 19, 1987. At the end of that day, in order to service their customers' accounts, securities firms needed to borrow several billion dollars to maintain orderly trading. However, given the unprecedented developments, banks were very nervous about extending further loans to these firms. Upon learning this, the Federal Reserve engaged in an immediate lender of last resort operation, with Chairman Greenspan making an announcement before the market opened on October 20 of the Federal Reserve's "readiness to serve as a source of liquidity to support the economic and financial system." In addition to this announcement, the Fed made it clear that it would provide liquidity to banks making loans to the securities industry. Indeed, what is striking about this episode is that the extremely quick intervention of the Fed resulted not only in a negligible impact on the economy of the stock market crash, but also meant that the amount of liquidity that the Fed needed to supply to the economy was not very large (see Mishkin (1991)).

Although a central bank's role as a lender of last resort has the benefit of preventing financial crises, it does have a cost. The lender-of-last-resort role leads to expectations that financial institutions will be subject to safety net, with the result that creditors to these institutions may not feel as strong an incentive to monitor these institutions to prevent them from taking on too much risk. There is thus a tradeoff between the moral hazard cost of the lender-of-last-resort role and the benefits of a lender-of-last-resort role in preventing financial crises.

The asymmetric information view of financial crises thus does see a danger in too liberal a use of the lender-of-last-resort activities on the part of central banks. The

lender-of-last-resort role must be used sparingly in order to keep moral hazard from getting out of hand argues against such intervention unless it is absolutely necessary. The lender-of-last-resort role should, therefore, occur very infrequently, and parts of the financial system that are likely to be the beneficiaries of a lender of last resort need to be regulated and supervised along the lines described above to minimize the moral hazard problem that the existence of a lender of last resort creates.

7.2. Emerging Market Countries

Institutional features of the financial systems in emerging market countries imply that it may be far more difficult for the central bank to promote recovery from a financial crisis. As mentioned before, many emerging market countries have much of their debt denominated in foreign currency. Furthermore, their past record of high and variable inflation has resulted in debt contracts of very short duration, and expansionary monetary is likely to cause expected inflation to rise dramatically.

As a result of these institutional features, a central bank in an emerging market country can no longer use expansionary monetary policy to promote recovery from a financial crisis. Indeed, this is probably the worst thing it can do. Suppose that the policy prescription for an industrialized country to pursue expansionary monetary policy and reflate the economy were followed in an emerging market country with the above institutional structure. In this case the expansionary monetary policy is likely to cause the domestic currency to depreciate sharply and may also lead to a dramatic surge in expected inflation. As we have seen before, the depreciation of the domestic currency leads to a deterioration in firms' and banks' balance sheets because much of their debt is denominated in foreign currency, thus raising the burden of indebtedness and lowering banks' and firms' net worth. In addition, the possible upward jump on expected inflation is likely to cause interest rates to rise because lenders need to be protected from the loss of purchasing power when they lend. As we have also seen, the resulting rise in interest rates causes interest payments to soar and the cash flow of households and firms to decline. Again the result is a deterioration in households' and firms' balance sheets, and potentially greater loan losses to banking institutions. Also because debt contracts are of very short duration, the rise in the price level from expansionary monetary policy does not affect the value of households' and firms' debts appreciably, so there is little benefit to their balance sheets from this mechanism as occurs in industrialized countries.

The net result of an expansionary monetary policy in the emerging market country with the above institutional structure is that it hurts the balance sheets of households, firms, and banks. Thus, expansionary monetary policy has the opposite result to

that found in industrialized countries after a financial crisis: it causes a deterioration in balance sheets and therefore amplifies adverse selection and moral hazard problems in financial markets caused by a financial crisis, rather than ameliorates them as in the industrialized country case.

For similar reasons, lender-of-last-resort activities by a central bank in an emerging market country, may not be as successful as in an industrialized country. When the Federal Reserve pursued a lender-of-last-resort role during the 1987 stock market crash, there was almost no sentiment in the markets that this would lead to substantially higher inflation. However, this is much less likely to be the case for an emerging market country. Given the past record on inflation, central bank lending to the financial system in the wake of a financial crisis which expands domestic credit might arouse fears of inflation spiraling out of control. We have already seen that if inflation expectations rise, leading to higher interest rates and exchange rate depreciation, cash flow and balance sheets will deteriorate making recovery from the financial crisis less likely. The lender-of-last-resort role of a central bank must be used far more cautiously in an emerging market country with the institutional structure outlined here because central bank lending is now a two-edged sword.

The above arguments suggest that recovery from a financial crisis in many emerging market countries is a much more complicated exercise than it is for industrialized countries. Expansionary monetary policy is not an option for stimulating recovery from a financial crisis in most emerging market countries, in contrast to industrialized countries. Monetary policy must be restricted to promoting low inflation and restoring confidence in the domestic currency and therefore cannot be used to meet an additional objective of stimulating recovery from a financial crisis. Indeed, a speedy recovery from a financial crisis in an emerging market country is likely to require foreign assistance because liquidity provided from foreign sources does not lead to any of the undesirable consequences that result from the provision of liquidity by domestic authorities.

Thus since a lender of last resort for emerging market countries is needed at times and it cannot be provided domestically but must be provided by foreigners, there is a strong rationale for having an international lender of last resort. However, because an international lender of last resort creates similar moral hazard problems to those created by a domestic lender of last resort, to operate effectively it must encourage regulation and supervision of the financial system in emerging market countries that can constrain excessive risk taking and must also operate infrequently. This is easier said than done, and a raging debate is now taking place on whether existing international

organizations like the International Monetary Fund are capable of performing this role adequately.¹⁷

8. Conclusions

This survey of financial instability and the macroeconomy demonstrates the devastating effects that financial instability and crises can have on the aggregate economy. Therefore, policymakers and particularly monetary policymakers should not be single minded in always focusing on price stability but also need to focus on financial stability in designing their policies. However, a focus on financial stability is by no means incompatible with the price stability goal. Price stability can help promote financial stability because it leads to longer duration debt contracts and a sounder currency. Under these conditions it is far more likely that debt will be denominated in domestic currency and be longer term. As we have seen, the move toward this type of debt structure leaves a country much less vulnerable to financial instability and makes it easier for policymakers to extricate a country from a financial crisis if it occurs.

The analysis here also demonstrates the dangers of unexpected disinflation and deflation to industrialized countries. Thus it provides emphasis to the message that the pursuit of price stability should involve a concerted effort on the part of central banks to avoid deflation. Another way of saying this is that concerns about financial instability should keep central bankers from falling into the "You never can be too rich or too thin" fallacy. Being too thin can certainly be damaging to your health - however, maybe this is not true for being too rich - and similarly inflation can be too low. Indeed, one of the attractive features of inflation targeting as a strategy for monetary policy is that, if done properly, it can help prevent financial instability by making sure that deflation will not occur.¹⁸

17. See Calomiris (1998), Feldstein (1998), Eichengreen (1999), and Mishkin (1999a).

18. See Mishkin (1999c) and Bernanke, Laubach, Mishkin and Posen (1999).

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Financial stability was the realm of prudential regulation and supervision (often managed by agencies separate from the central bank). This framework found an intellectual foundation in New Keynesian models, which implied that “under broad conditions” price stability would keep output around its natural level. 10. Not surprisingly, given the limited empirical evidence and the lack of an accepted theoretical framework, the question of leaning against the wind is hotly contested. It emphasizes that financial stability is by no means incompatible with the goal of price stability. In fact, price stability can promote financial stability since it leads to longer duration debt contracts and a sounder currency. To annotate the abstract at the left please login. (?) creation-date. Financial stability analyses are complicated by the lack of a clear and consensus definition of “financial stability”, and the paper concludes that operational definitions of this term must be expected to vary across alternative models. Furthermore, since assessment of financial stability in general is based on a wide range of risk factors, one can not expect one single model to satisfactorily capture all the risk factors. Keywords: banks, financial crisis, financial history, leverage, macroeconomic history, macroprudential policy, monetary policy, recessions. JEL Classification: E02, E31, E32, E42, E44, E51, E58, F32, F42, G01, Suggested Citation: Suggested Citation. Taylor, Alan M., Credit, Financial Stability, and the Macroeconomy (March 2015). CEPR Discussion Paper No. DP10511, Available at SSRN: <https://ssrn.com/abstract=2588414>.