Financial Stability and Public Policy: An Overview

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The paper reviews the sources of market failure in financial institutions and markets and what can be done to alleviate them. It examines game-theoretic explanations for financial instability, in particular the role of asymmetric information in generating destabilizing behavior. In the area of remedies, the paper analyses the potential contribution of official safety nets and what can be done to minimize the associated moral hazard. It discusses the role of public policy in this context.

I. Introduction

A considerable amount of discussion has been generated in recent times on the issue of financial stability. It is now well recognized that the safeguarding financial stability is of central importance to the effective functioning of a market economy. It provides the basis for rational decision-making about the allocation of real resources through time, and in the absence of imperfections in the real sector, improves the climate for savings and investment. To exemplify, in Mexico what began as a currency crisis, eventually turned into a serious recession and created huge strains on the banking system, further exacerbating the recession and via the *tequila effect*, subsequently had systemic ramifications in several emerging economies. The absence of stability creates damaging uncertainties that can lead to resource misallocation and reduce the willingness of agents to enter into inter-temporal contracts. Maintaining stability is therefore a key objective of financial intermediaries.

As a starting point, a distinction needs to be made between monetary stability and financial stability. Monetary stability can broadly be defined as the stability of the general price level; financial stability, on the other hand, refers to the smooth functioning of institutions, markets and infrastructure. Although there can be important common elements between the forces making for instability in the price level and fragility in the financial system, the two phenomena are not

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the same. The principal focus of the survey will be *financial* stability, that is, the stable functioning of the intermediaries and markets that constitute the building blocks of the financial system.

One can distinguish between two main sorts of financial instabilities: instabilities in institutions and instabilities in markets (Crockett, 1997). Institutional instability exists when 'failure of one or a few institutions spreads and causes more widespread economic damage'. Market instability, on the other hand, is defined 'in terms of the wider impact that volatility in asset prices and flows can have on the economy'. These apart, another potential source of instability, which has gained prominence in recent times, has been instabilities associated with disruptions to market infrastructure.[2]

Earlier, the occurrence of periodic episodes of financial turmoil was attributed to external shocks or various forms of aberrant behaviour (Kindleberger, 1978). However, recent interest in financial stability, both from the theoretical standpoint as well as from the policy angle, has been driven by two major considerations. Firstly, advancements in finance have provided a coherent macroeconomic foundation about the observed phenomena of financial instability. From the policy perspective, the growth and integration of world financial markets and the systemic repercussions that idiosyncratic failures might engender, have increased the importance of policy actions to safeguard financial stability.

Having outlined the various types of instabilities, the rest of the essay will proceed as follows. The first part will review the various reasons that have been advanced why institutions should be particularly prone to instability. The second part examines the issue of instabilities in markets. The third section examines instabilities in market infrastructure. The subsequent section considers the possible responses. How can official actions make markets work better, or

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[1] A particular category of payments system risk occurs in foreign exchange settlement. This is often referred to as *Herstatt risk*, after Bankhaus Herstatt, a medium-sized Frankfurt bank failed in 1974, causing widespread losses to counter-parties. Such a risk arises because settlement of the two legs of a foreign exchange transaction typically take place at different times, and in different markets., so that the gap between the issuance of initial payments instructions and final settlement of the transaction is longer than in domestic payment systems.

otherwise, reduce the potential for instability? Answers to these questions lie at the core of the quest for a safe, efficient, reliable and resilient financial system. The final Section contains the concluding remarks.

II. Sources of Instability

For a considerable period of time, the two standard explanations propounded to explain episodes of financial distress were characterized as cyclical and monetarist. The cyclical school of thought (Kindleberger, 1978) focused on the various forces making for cyclical excess. The process was usually initiated when some favorable event leads to a bidding up of asset prices. Such a phenomenon was more likely to occur if a substantial period elapsed since the last crash and the underlying pecuniary motive gathered momentum. In such a situation, a rise in price leads to further buying in anticipation of a continuation in the current price trend (bandwagon effect). Eventually, when prices reach overvalued levels or some external event occurs that shatters the confidence in the system, prices collapse, inducing a downward spiral, so that financial intermediaries, whose portfolios are financed by borrowing, are badly affected.

The monetarist view (Friedman and Schwartz, 1963), on the other hand, contends that financial instability is not likely to arise or become serious in the absence of a disruption in money supply. In this view, it is monetary policy mistakes that either initiate financial instability or engenders disruptions. Schwartz (1986), in particular, has labeled as 'pseudo-financial' crises those disturbances that are not accompanied by a significant decline in the quantity of money.

Neither of these explanations appear to be entirely satisfactory. The Minsky hypothesis of cyclical excesses leaves an uncomfortable burden to be borne by irrational behaviour, unsupported by any underlying rigorous microeconomic foundation. The monetarist view, although more self-contained theoretically, is rather limited in its approach since it does not explicitly internalize the possibility of disturbances arising from non-monetary factors.

Recent advances in game theory and the economics of decision-making under uncertainty have offered more satisfactory explanations as to why agents act in ways that produce instability in financial institutions. These insights have also provided strong microeconomic underpinnings to the earlier works. In what follows, attention will first be paid to the sources of instability in financial intermediaries and next, to what gives rise to volatility in asset prices.

II A. Fragility in Financial Institutions

Role of Financial Intermediation

Advances in the theory of asymmetric information have provided significant insights regarding the vulnerability of financial intermediaries to a sudden loss of confidence. Asymmetric information gives rise to the problems of *adverse selection, moral hazard* and *ex-post verification* (Van Damme, 1993). In the market for loans, the asymmetric information process ensures that borrowers are relatively well-informed about the risk-return characteristics of the projects vis-à-vis the lenders. Adverse selection therefore serves to ensure that a disproportionate number of 'bad' (risky) projects are presented for financing, leading to the phenomenon of credit rationing by lenders.

When such problems become acute, there might not be any price at which buyers and sellers are willing to trade, given the uncertainty about the quality of the goods being traded. Such a situation necessitates an institutional mechanism to overcome this informational asymmetry. In the financial sector, such a mechanism is a financial intermediary. The idea is that financial intermediaries can exploit economies of scale and scope in monitoring borrowers on behalf of investors and thereby reduce the cost of finance.

Left to itself, this begs the question as to who monitors the monitor? How do investors establish the quality of banks? The insight provided by Diamond (1984) was to argue that banks could overcome this infinite regress problem by holding a portfolio of loans. Portfolio diversification eliminates the risk of investing in a single project and enables banks to offer depositors standard debt contracts,

which offer a fixed return. Judged thus, depositors can arbiter banks merely in terms of whether they offer the going rate of return.

'Runs' on Financial Intermediaries

The vulnerability of banks results from the interaction of liabilities that are relatively more liquid than assets. Asymmetrically informed depositors may become nervous about the solvency of their banks or they may become nervous about other depositors' nervousness and about the possibility that those other depositors may withdraw their deposits from the bank, thereby impairing the liquidity of the first group of depositors. Such fears and anticipations can lead to depositor runs, which could cause premature closure of even solvent banks and cold be contagious among banks. In essence, depositors face a 'Prisoners Dilemma' problem, with each deposit withdrawal imposing negative externalities on other depositors. Mention may be made in this context of the fact that, prior to the 'thirties, the US banking system suffered periodic banking panics and crisis, involving depositor runs, culminating in the banks runs of the early 1930s that led to the closure of over 9,000 banks between 1930 and 1933 (White, 1999).

Asset Quality Problems

If the dynamics of financial runs have become better understood as a result of advances in economic theory, what are the factors initiating episodes of financial instability? Fears of loss of liquidity sustain and intensify runs, but what causes the erosion of confidence in the first place? Typically, banks get into trouble because of deteriorating asset quality. They lend to activities that generate significant profits during boom times, but turn out to be vulnerable when underlying economic conditions become unfavourable. Recent writings have revealed the systematic influence of other phenomena, related to debt deflation, disaster myopia, herd behaviour, perverse incentive structure, principal-agent problem and negative externalities.

The *debt deflation* theory (Fisher, 1933) contends that a shock to a highly indebted economy, implying significant default on interest and repayment

obligations, can generate distress sale of assets, declining asset prices, consequent falls in general wages and prices, rising real debt burdens, calling-back of loans, contagious bank failures and a collapse of overall economic activity. In effect, excessive debt and deflation reinforce each other and drive the economy into a downward spiral.

Disaster myopia[3] (Guttentag and Herring, 1984) occurs when lenders' assessment of the potential distribution of economic outcomes (subjective probabilities) differs from reality (objective probabilities). Disaster myopia can occur for a variety of reasons. For example, disastrous outcomes might occur so frequently that it is might prove impossible to assign with a reasonable degree of certainty any meaningful probability to the future occurrence of the event. Alternately, changes in policy regimes could push economic conditions well beyond the boundaries that were factored into account when the decisions were first made. In such circumstances, financial intermediaries may not find it worthwhile devoting scarce management time to analyzing such eventualities. In their view, such disasters are expected to engender countervailing action by the authorities designed to stave of its consequences.

A third aspect of lending action that gives rise to difficulties is what is referred to as *herd behaviour* (Banerjee, 1992). Herd behaviour can be a manifestation of irrationality, but it can also reflect rational maximization under uncertainty. The fact that others are lending may be considered as invaluable information concerning the creditworthiness of a potential borrower. And importantly, managerial performance is generally judged relative to some market benchmark. The disincentives for being wrong in company are generally much less than for being wrong in isolation.

A fourth type of problem arises from the fact that management compensation structures can generate perverse incentives, which in turn, is an aspect of the *principal-agent* problem. Such problems arise because those who make financial decisions are compensated in ways not fully congruent with the

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[2] Disaster myopia may be defined as a tendency to disregard uncertain, low probability, high-risk hazards (Davis, 1999).

success of their investment decisions. So, if an economic agent receives a handsome bonus if an investment is successful, but suffers no more than temporary loss of employment, if his decision adversely affects the employer, it would be rational for such an agent to favour high risk-return strategies vis-à-vis strategies with reasonable risk-return profiles.

The final aspect of asset quality problems arises from negative externalities. *Negative externalities* arise when some of the costs of an agent's decisions accrue to outsiders. Such externalities are often a pertinent feature, particularly of the banking industry because of the relatively small cushion of own funds relative to total balance sheet size. The smaller the net worth of the bank, the less is the probability that its owners have to lose from adverse outcomes and the more inclined they are to pursue high-risk strategies or 'gamble for resurrection' (Dewartipont and Tirole, 1994).

Contagion

Another reason why the financial industry is often thought to be particularly prone to systemic instability is because of the possible vulnerability to *failure contagion* across institutions. Contagion effect are often a significant feature of the financial sector than otherwise for two main reasons. Firstly, there is a network of interlocking claims and liabilities through the inter-bank market and the payments and settlements system. These have become more pronounced and increasingly dominant in recent years, with the growing integration of national and international capital markets (Goodhart, 1998a). Secondly, informational asymmetries make it more difficult for creditors to correctly judge the strength of a financial institution on the basis of publicly available information. As a result, creditors may therefore be inclined to presume difficulties at one institution as indicative of potential vulnerability at other institutions with similar business structures. More importantly however, bank failure contagion is liable to (a) occur faster; (b) spread more broadly ("domino" effect), (c) result in a larger number of failures, and (d) result in significant losses to creditors.

Resolution Costs

Last, but not the least, the costs that fall on the public budget provides the most persuasive evidence of the need to take public policy actions to strengthen financial systems. The most prominent example of this pertains to the US S&L debacle of the 1980s, the resolution costs of which are estimated anywhere between 2 and 4 percent of GDP. These numbers however pale in comparison to the costs incurred in a number of other countries.

Table 1: Costs of Resolving Banking Sector Crises in Selected Economies

Country (Period of crisis)	Estimate of cost/losses (per cent of GDP)
Latin America Economies	
Argentina (1980-82)	13-55
Mexico (1994-95)	12-15
African Economies	
Cote d' Ivorie (1988-91)	25
Senegal (1988-91)	17
Asian Economies	
Sri Lanka (1989-93)	9
Malaysia (1985-88)	5
Transition Economies	
Bulgaria (1990s)	14
Hungary (1995)	10
Industrial Economies	
Spain (1977-85)	17
Japan (1990s)	10
United States (1984-91)	5-7

Source: Goldstein (1996) and World Economic Outlook (1998).

In France, the losses incurred by a single bank, *Credit Lyonnais*, are placed at around USD 30 billion, or over 2 percent of GNP. Honohan (1997) estimates the fiscal costs of resolving crisis in developing countries alone as being as much as USD 250 billion. Recent studies have placed the resolution costs of such crises anywhere between 5 to 55 per cent of GDP (Table 1). The resolution costs of these crises often falls on the banking system, and it the system is state-owned, on the government. As Sundarrajan and Balino (1991) has observed, in such situations, the use of public money to support distressed institutions often endanger efforts to rein in budget deficits. And even if budget

deficits are viewed as (domestic) transfers rather than as real economic costs, it can compel the authorities towards less benign ways of deficit financing (e.g., an inflation tax); the rescue process itself can wean the incentives for creditors to monitor the behaviour of banks in the future.

II B. Fragility in Markets

Instability in markets, i.e., excessive volatility of asset prices, can be a matter of just as much concern. The two markets in which instability has been most disconcerting and therefore subject to serious economic analysis have been the foreign exchange and the equity markets. These apart, instability in other markets, such as in real estate market has an important factor for the transmission of distress in the financial system, as evidenced from the recent experiences in South-East Asia (Bank for International Settlements, 1997 and 1998).

Foreign Exchange Market

Foreign exchange market instability can be divided into two main types. The first takes place in a managed exchange regime when a discrete change in the currency's external value takes place[4]. This is usually described as a currency crisis. The second occurs in a floating exchange rate situation, when the amplitude of fluctuations in the market exchange rate exceeds that which can be explained on the basis of underlying fundamentals. This is usually coined as volatility.

A currency crisis occurs when market participants lose confidence in the sustainability of the currency's current exchange rate and seek to reduce their exposure denominated in that currency. The most common explanation offered for such a crisis is that the authorities of the country concerned have sought to peg their exchange rate at a level that is incompatible with the underlying macro policies. While the exchange rate may be maintained for a certain period through

[3] Eichengreen, Rose and Wyplosz (1998) have quantified such a discrete change as a nominal depreciation of the currency of at least 25 per cent.

the use of reserves or otherwise, eventually the weight of market opinion implores that a change in the exchange rate is unavoidable. This position has however, not gone unchallenged. Several authors (Eichengreen, Rose and Wyplosz, 1993) have suggested that the exchange rate market may be subject to multiple equilibria. In such a setup of pegged exchange rates, so long as the exchange rate peg is considered 'credible', the evolution of domestic factor costs is consistent with external equilibrium. However, once a change in the exchange rate occurs, a new set of expectations governing price formation evolves and the exchange rate ceases to be in equilibrium.

When exchange rates are floating, volatility is often harder to explain. As Eichengreen (1999) has observed, "swings in relative real values among the US dollar, the Deutsche mark and the Japanese yen have approached 50 per cent or more in the past decade and a half. Such swings complicate macroeconomic policies, generate the potential for resource misallocation, and gives rise to protectionist measures. While it can be argued that exchange markets are responding to policy divergences (actual and expected), the link is often not at all clear".

Equity Markets

Instability in equity markets comprise another potential source of financial instability. Stock market instabilities cannot be easily explained by rational speculative behaviour. Three standard explanations have been advanced as to why stock markets should be particularly prone to instability: (a) speculative excesses, (b) instability in macroeconomic policies, and (c) internal market dynamics. Any episode of market instability might contain elements of all the three explanations in varying degrees.

Speculative excesses come closest to the Minsky-Kindleberger explanation. As memories of the most recent crash wean out of public memory and economic recovery causes equity prices to rise, naïve investors jump on the bandwagon, intensifying an upward movement. There might be particular sectors that are favoured, because of their perceived growth potential. Whatever the

contributory causes, a process develops that leads to a bidding-up of asset prices. Eventually, reality sets in and prices crash.

Another potential source of stock market volatility lies in *macroeconomic instability*. Since equity prices represent the present discounted value of a future stream of earnings, they will change whenever an event occurs that changes either the expected future income stream or the rate at which it is discounted by the market. When a major change in economic prospects occur, the prospective future shifts in income streams have an effect on the current prices.

Stock market declines have the potential to affect real economic activity through several channels. Firstly, the fall in private sector wealth will have a direct effect on willingness to spend out of current income, akin to the ratchet effect. Estimates produced at the time of US stock market crash of 1987 suggested that the negative effects on industrial country output from wealth effects would be less than one-half of one percent of GDP (IMF, 1988).

A second channel through which stock market declines affect real economic activity is *via* their effect on financial intermediaries. If declining equity prices reduce the net worth of financial institutions and their customers, they may exacerbate asymmetric information problems and lead to a reduction in the level of financial intermediation (Mishkin, 1994). This, in turn, would make it harder to mobilise funds for productive investment and lead to a cumulative contraction in the level of output.

Fixed Interest and Real Asset Markets

Apart from the exchange market and the stock market, the markets for *fixed income securities* (bonds) and real estate are also important, although they have attracted less attention in the literature. The most prominent instance of bond market instability occurred in 1994, when long-term bond yields rose sharply in most major markets, raising fears that certain financial institutions might find themselves in difficulty.

A second potential source of macroeconomic instability lies in instability in the prices of *real asset*. The effect is more pronounced when the asset

concerned is a large component of the private sector's real wealth, when changes in its price affect the profitability of different production technologies and when such price movements create generalized inflationary or deflationary pressures. The crisis in South-East Asia has been a testimony to the consequences of speculative excesses and its impact on real estate markets.

A third significant source of instability lies in fluctuations in *commodity prices*. The most striking example of this is to be found in two rounds of oil price increases in the early and late 'seventies, and the subsequent decline in real energy prices in the past decade. Energy is an important component of the production process and significant changes in its cost has an effect both on the aggregate cost of production (and therefore on measured inflation) and on the relative cost of factor inputs (and therefore, on the choice of production technologies).

II C. Fragility in Market Infrastructure

Payment and Settlement System

The growth in volume of both domestic and international transactions has meant the transfer of an enormous funds across the globe. Such transfers are usually effected through the payments and settlements system. Consequently, the payments network has become one of the most likely channels of transmission of a generalized shock throughout the financial system. Needless to mention, most developed countries have switched over to a Real Time Gross Settlement (RTGS) system in the face of such vulnerabilities and several others have initiated a process of movement towards RTGS.

At the same time, the phenomenal growth in off-balance sheet (OBS) activities of banks, through the use of derivative instruments, has meant that credit exposures in settlement systems have increased at a pace much faster than real economic activity. In fact, the Report of the U.S. Government Accounting Office (GAO) concluded that derivatives pose a major threat to financial stability and recommended several measures to strengthen government regulation and supervision of all participants. The fear of a major bank failure

because of OTC derivative activities appears to stem from two sources. First, the sheer size of banks' OTC derivative activities suggests that they may be exposed to substantial market and credit risks. In particular, there is concern that as OTC derivative dealers, banks may be exposed to sizeable counter-party credit risk. Such concerns have been heightened in recent times, consequent upon the near-bankruptcy of *Metallgesellschaft* and Barings. Secondly, many fear that regulation, as well as managerial sophistication, has lagged developments in the derivatives area, and, as a consequence, banks may be taking risks much more above the limits of prudence. In the view of several writers (Corrigan, 1996), these exposures, which often amount to a multiple of a bank's capital, have become the single biggest threat to the maintenance of stability in the financial system.

III. Achieving Financial Stability

The article has thus far concentrated on some of the reasons as to why institutions, markets and the associated infrastructure may be subject to instability. It is therefore important to devise policies that can safeguard stability in the financial system. In what follows, we first consider approaches aimed at improving the stability of financial institutions and next, consider ways in which excessive volatility in financial markets can be reduced. The final part of the section focuses on mitigating disruptions in market infrastructure.

A. Improving the Functioning of Financial Institutions

Safety Nets

It has long been recognized that the particular nature of the banking industry makes it imperative that there should exist a lender-of-the-last resort (LLR) to provide the assurance of stability under all circumstances. Because banks are in the business of enhancing the creditworthiness and the liquidity of private financial obligations, they are vulnerable if, for whatever reason, their depositors seek early repayment of their claims at the same time. This is the argument adduced for the LLR function of the central bank, as a sort of

catastrophic insurance coverage that should be used only in situations of extreme distress.

Another type of safety net is implicit or explicit deposit insurance. If depositors are insured by an entity of unquestioned creditworthiness, then the incentive for sudden withdrawals in the case of any eventuality would stand curtailed. In India, a system of deposit insurance was established in the early 'sixties and the insurance cover presently stands at Rs. 1 lakh per depositor. Although the coverage of deposit insurance varies across countries, one might surmise that even in countries that do not have such mechanisms, in case of an eventuality, the authorities would take the necessary steps to ensure that the losses suffered by retail depositors are minimized.

Several variants of this approach, among others, a co-insurance fund (such as putting a certain percentage of each depositors account at risk) and a system of risk-based deposit insurance have been advanced in the literature. Although such schemes have the advantage of increasing the monitoring incentive of depositors, they nonetheless suffer from implementation problems.

The general problem of safety net mechanisms is that they exacerbate the problem of moral hazard. Not only is it inherently difficult for the lender to control the behaviour of an economic agent, incentives might be created that reduce the desire of lenders to even attempt such control. If banks believe that they will be rescued in cases of illiquidity, they will have fewer incentives to prudently manage their portfolios, consequently, their interest in the institution in which they place their funds will be that much lower.

Reducing Moral Hazard

Awareness of the problem of moral hazard has led to a search to mitigate its consequences. Several ways of dealing with the problem have been discussed in the literature. These include, among others, prudential regulation, narrow banking, increased disclosure and transparency and reducing settlement risk. We take these up in turn.

A time-tested approach to dealing with moral hazard is through regulation. The basic justification for bank regulation is that, in its absence, banks might accidentally or otherwise indulge in excessive risk-taking, so that even market discipline might prove insufficient to prevent this. Several complementary reasons have been cited as to why banks might be subject to regulation. These include (a) to protect the bank's customers from loss (consumer protection argument), (b) to reduce the incidence of contagion (the systemic risk argument), (c) to avoid losses to the deposit insurance fund or the LLR (the fiscal argument), and finally, (d) to improve the allocation of resources in the financial system (the efficiency argument).

Two different approaches to bank regulation can be distinguished (Goodhart, 1995). The first focuses on controlling the activities that the regulated institutions can engage in, the second one focus on ensuring that they are adequately capitalized against the risks they run.

Commercial Banks in the Securities Business

The issue of whether commercial banks should be permitted in the securities business and act as universal banks has been debated and discussed widely in developed countries like the United States. Following the First World War, commercial banks became increasingly involved in the securities underwriting business. The principal argument in favour of abolishing the separation of commercial and investment banking is that artificial limitations constrain the *laissez faire* configuration of banking. In other words, that separation impairs the cross-sectional reusability of information between commercial and investment banking and constrains them from reaping the economies of scale and scope that they might otherwise enjoy. In a wider sense, universal banks which have equity stakes in non-financial entities are said to be able to internalize situations of financial distress better than commercial banks and securities markets.

Universal banking is presently being debated in India in view of the overlapping of activities between banks and financial institutions. Presently, there

are no restrictions on banks' investments in preference shares/non-convertible debentures/bonds of private corporate bodies. Banks are also allowed to invest in corporate stocks. However, such investments are restricted to 5 per cent of the incremental deposits of the previous year. Banks are also allowed to underwrite subject to the limit of 15 per cent of the issue size. In case there are devolvements and the aforesaid 5 per cent limit is exceeded, banks are required to offload the excess holdings. Banks are also allowed to own 100 per cent investment banks and undertake mutual funds activity through separate entities. Guidelines have recently also been issued for entry of banks and non-banking financial companies into insurance business.

One of the major motivations for the separation of commercial and investment banking both in the 1930s and in present times concerns the potential for conflicts of interests. Critics have argued that banks might abuse the trust of their customers and take advantage of them by selling low quality securities without fully revealing the associated risks. Such behaviour could broadly undermine confidence in the market and banks themselves.

The debt crisis in the early 1980s came close to destabilising the banking system in a number of major developed countries, with potentially far-reaching consequences. It added weight to the argument for giving a new focus to the supervision of financial institutions that would strike a better balance between ensuring stability and containing moral hazard. Under the so-called Basle Capital Convergence Accord for example, banks were required to hold a certain minimum level of capital in relation to the credit risks of their portfolio.

Regulatory Standards

Risk-based capital requirements have not been without their critics, however. Objections have been raised, not so much to the principle of relating capital-holding to risk, but to the way risks are measured and the somewhat arbitrary process for setting minimum capital levels. The absence of any formal mechanism to take into account the risk-reducing properties of a diversified portfolio of credit risks has also been questioned. Secondly, the focus in the

original Accord on credit risk, to the exclusion of other kinds of risks, was a subject of criticism. Thirdly, the rule of 'one-size-fits-all' aspect of the capital adequacy ratio was also the subject of intense debate and recent crises have only drilled home the point that baseline capital adequacy norms are not enough of a hedge against failures. In response to such criticism, the Basle Committee on Banking Supervision has proposed a Consultative Paper on the new capital adequacy framework, based on the three pillars of *minimum capital requirements*, *supervisory review process* and *effective use of market discipline*. Under the first pillar, the Committee has proposed to build on the extant 'minimum regulatory capital requirements' by announcing explicit risk weighing structure for different activities. The second pillar envisages a more pro-active role for the regulator by requiring that they ensure that a bank's capital position is consistent with its overall risk profile and strategy, which, in turn, is sought to be achieved through supervisory review of bank-specific internal capital assessment processes. The third pillar of market discipline seeks to ensure greater levels of disclosure and enhance the role of market participants in encouraging greater capital holdings by banks (Drage and Mann, 1999).

Given the growing disenchantment with capital adequacy standards, newer approaches to risk measurement are being discussed. These methods include a subtly differentiated prudential weighing scheme, Value-at-Risk (VaR) models and pre-commitment approach (PCA) have been advocated. The issue of *differentiated prudential weighing scheme* is currently being discussed by regulators across the globe. Under the *Pre-commitment Approach*, a bank itself decides how much capital it will hold within a given period to cover risks arising from its trading block. Sanctions will apply if the accumulated losses exceed the amount. The *Value-at-Risk* approach has emerged as a major tool for measuring market risk and is being used internally by banks for risk management and as a regulatory tool for ensuring the soundness of the financial system. However, the basic problem with such models lie in (a) obtaining adequate/high-frequency data

and, (a) devising a satisfactory way of handling the variability of credit exposures.[5]

Narrow Banking

Another approach to maintenance of stability that has found support has been narrow banking. Advocated by Friedman[6] in 1959, it found support in the writings of several writers (Litan, 1987). Simply put, it states that a category of institutions ('narrow' banks) would be authorized to accept deposits that can be withdrawn on demand. These banks would be required to continue their investments to certain categories of safe assets. However, for one reason or the other, the proposal has not found much favour in policy circles.

Disclosure and Transparency

An approach to improving the functioning of financial entities which has gained currency has been reliance on enhanced disclosure standards to enforce prudent behaviour. In this, the authorities would make clear that they took no responsibility for bailing out distressed financial institutions, in order to stimulate more active regulation by the market. Greater transparency, coupled by strict disclosure standards, would enable depositors to discriminate between risky and less risky banks, and strengthen managerial incentives by making banks management more personally accountable when losses occur[7]. In a recent article, Cordella and Yeyeti (1997) have suggested that increased market

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[4] Under PCA, banks choose a level of capital to back their trading books for a given period of time. If the cumulative losses of the trading book exceed the chosen cover at any time during the period, the banks are penalized, possibly by fines. The chosen capital is thus a 'pre-commitment' level, beyond which penalties are imposed. This might lead to the problem of over-capitalisation under PCA. Under VaR on the other hand, the regulator must try to ensure that the internal model used to calculate risk is accurate. Otherwise, banks might misrepresent their risk exposure. This might lead to the problem of monitoring under VaR.

[5] Friedman's 100 per cent reserve requirement.

[6] King (1999) has suggested a 'middle way', based on the principle that if emergency services are be slow to arrive, then borrowing countries should have adequate resources on hand to withstand any incipient crisis. The five basic tenets of the middle way comprise of (a) self-insurance against a liquidity crisis; (b) avoid currency and maturity mismatches; (c) encourage equity flows, as opposed to debt flows, backed by a credible legal and institutional infrastructure; (d) encourage incentive

discipline through improved transparency is likely to lead to a more stable banking system. The intuition is that in the absence of disclosures, depositors and other creditors assume that banks will choose riskier positions and that the debt (deposits) will be priced accordingly. The solution then is for a bank to take riskier options. In contrast, with full disclosure, i.e., with its risk known, the bank can take less risky options. As a result, by enhancing market discipline, more effective disclosures lead to a more stable banking system.[8]

In India, the transparency aspect has been emphasized by expanding the coverage, timeliness and analytical content of the information provided in various publications by the supervisory authorities. The authorities have also mandated disclosure of some of the essential strength indicators and performance-related parameters as part of the 'Notes on Accounts' in the annually published accounts of banks.

Statistical Indicators of Instability

In an influential study, Goldstein (1997) has documented the best and worst performing indicators of banking and currency crises in developed, developing and emerging market economies. The conclusions are summarised in Table 2.

As Goldstein (1997) cogently argues, the better leading indicators seem to anticipate correctly somewhere between 80 and 100 per cent of the banking and currency crises over the period 1970-1995, and that '…the leading indicators that show the best forecasting accuracy also tend on average to send the earliest and most persistent signals of banking and currency crises'. However, ' …banking crises appear to be somewhat harder to forecast accurately than currency crises'.

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compatible debt contracts between creditors and debtors in case of difficulties; and, (e) avoid fixed exchange rates, when they are no longer consistent with internal and external equilibrium.

[7] Mention needs to be made in this context of New Zealand's approach to regulation through greater emphasis on market discipline through public disclosures by banks, increasing the accountability of bank directors and management and reducing the extent of prudential regulation (Brash, 1997).

Table 2: Currency and Banking Crises: Best *vs* Worst Performing Indicators

	Currency Crises Indicators	*Banking Crises Indicators*
BEST	Real Exchange Rate	Real Exchange Rate
	Banking Crisis	Equity Prices
	Exports	M2 Multiplier
	Equity Prices	Real Output
	M2/International Reserves	Real rate of interest on deposits
	Real Output	Exports
WORST	Terms-of-trade	International Reserves
	Domestic/foreign interest rate differential	Terms-of-trade
	Imports	Excess real M1 balances
	Lending interest rate/ Deposit interest rate	Lending interest rate/Deposit interest rate
	Bank Deposits	Imports

Source: Goldstein (1997)

Needless to say, this is one area that has witnessed an explosion of research. Recent work in this area, including Frankel and Rose (1996) and Honohan (1997) have emphasized the important role of foreign borrowings, particularly short-term liabilities denominated in foreign currency, to measure the degree of exposure to currency and inflation risks. The recent literature also focuses on the level of non-performing loans (NPLs)-studies such as Gonzalez-Hermosillo (1999) shows empirical evidence that the CAMELS-type assessment is statistically significant only if NPLs and capital adequacy are simultaneously considered[9]. Other indicators to capture financial vulnerability include a measure of segmentation (proxied by inter-bank interest rate differential), the deposits to M2 ratrio and aggregate stock indices. In surveying literature on these indicators, Demirgic-Kunt and Detragiache (1999) point to criticisms on the use of CAMELS based criteria to measure bank strength[10]. Subsequently, Gonzalez-Hermosillo (1997), using both micro and macro factors in explaining banking fragility

[8] Non-performing loans may be of particular relevance, as they give an indication of risks to capital adequacy from future write-offs (Davis, 1999).

[9] Kaminsky and Reinhart (1996) show that currency crises are often preceded or accompanied by banking crises.

concludes that the introduction of macro variables significantly improves the explanatory power of models based on micro-prudential indicators only.

The IMF, in a recent study on financial sector surveillance, has identified a set of macro-prudential indicators. These are categorised under two broad categories (a) aggregated micro-prudential indicators and (b) indicators of macroeconomic developments. However, the number of indicators included under these two heads is extremely large, numbering more than fifty and as the paper aptly recognises, it compromises on the principle of parsimony. It is therefore suggested that there is the need to develop a smaller and manageable set of indicators, primarily for purposes of periodic monitoring and data dissemination[11,12].

Empirical research in this area is in a state of flux and with hindsight, one might hazard a guess that much rigorous analysis is called for before one can predict with a reasonable degree of certainty the early warning indicators of such crises.

B. Improving the Functioning of Financial Markets

Excessive volatility in asset prices can also have adverse macroeconomic consequences. Therefore, policy makers have a responsibility in ensuring that undesirable price volatility is not generated by their own macroeconomic policies or by the microstructure of financial markets.

Dealing with Asset Price Instability

It is possible to distinguish two sorts of price instabilities. One is the result of unnecessary variability in the underlying determinants of asset prices. Such

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[10] Davis (1999) has outlined the types of financial data required for macro-prudential surveillance. As Davis observes, the essential point is to seek to detect emerging patterns of financial stability in advance and guage their gravity when they occur by observing the *overall pattern of economic and financial developments in a judgemental manner, informed by the events of the past that have entailed systemic risks, and with a broad conceptual framework derived from theory to identify appropriate danger signals* (italics in original).

[11] Patra and Roy (1999) have attempted to delineate the optimum thresholds of financial stability in India for the period 1970/71-1997/98. The variables used in their setup include (a) Real GDP

variability might often reflect 'out-of-equilibrium' behaviour, consequent upon certain policy dilemmas or certain policy inconsistencies elsewhere in the system. Price instability in such cases often act a signaling device, necessitating the need for remedial policy actions to bring them in line with other sets of domestic policies. A second sort of instability arises from imperfections in the price discovery mechanism (such as asset bubbles or over-shooting).

Asset price instability linked to macro-economic policies developments is probably the more important, but there is less to be said about it. Clearly, the answer lies in the pursuit of policies that are mutually consistent and sustainable over time. This has become all the more important with the growing of global capital markets and the development of new financial instruments.

Although markets have become more powerful in ensuring that financial prices ultimately reflect fundamental economic determinants, they do not always do so in a smooth way. Lags in perceptions may mean that disequilibrium can exist for a while, perhaps because market opinion is divided about whether or not the situation is indeed sustainable, before corrective forces asset themselves. Then, of course, the risk is that the needed price adjustment will be more sudden and disruptive than it would have been had corrective action been taken earlier.

Enhancing Stability in Foreign Exchange Market

In the foreign exchange market, two kinds of measures have been advocated to promote stability. First is the choice of an exchange rate regime. The other is through policies to make the chosen exchange rate regime function as smoothly as possible.

The question of what is the best exchange rate regime necessary to reduce unwanted stability has attracted much attention over the years. The practical dilemma facing the monetary authorities has been formalized in terms of the 'inconsistent quartet': the fact that the four objectives of stable exchange rates, an independent monetary policy, free trade and full capital mobility cannot all be simultaneously pursued.

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growth, (b) inflation rate, (c) international reserves, (d) money multiplier and (e) export growth (in

Dealing with Currency Crises

Greater integration of global capital markets has had the consequence of giving rise to currency crises. There are three broad approaches that have been discussed in the literature that can be pursued when crises occur. Firstly, to organize a financial rescue; secondly, to allow events to take their own course, accepting the possibility of an excessive depreciation and/or default on external debt and thirdly, to arrange a rescheduling and re-negotiation of existing claims. Each of these approaches have their respective merits and drawbacks.

A financial rescue can limit the adverse effects on real living standards and help to limit the contagion effects elsewhere. If the financial support is based on appropriate conditions, it can also contribute to the adoption of corrective macroeconomic policies. On the flip side of the coin, the expectation that the international community will provide emergency assistance in the event of extreme debt-servicing difficulties risks worsening moral hazard. The experiences of South-East Asia have shown that emergency assistance on a significant scale might often be difficult to garner, with severe difficulties for the future debt-servicing capability of the economy.

Allowing market forces to chart their own route avoids the problem of moral hazard and in the end probably makes economic agents-borrowing governments and external lenders-more cautious. The downside is that a *laissez faire* approach would involve larger costs in those crises that did nevertheless occur. The costs in terms of lost output and inflationary pressure would be higher than in circumstances where international assistance was available in support of a well-designed adjustment programme.

The demerits of both the financial rescue as well as the *laissez faire* approach have led to a search for alternative ways of dealing with sovereign liquidity crises. An approach that has been advocated in the literature has been the re-schedulement/re-negotiation of loans. Such an approach has obvious attractions, but has its pitfalls too. For one, legal frameworks differ so much

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dollars).

across countries that it would be well nigh impossible to agree on a common approach at the sovereign level. For another, the ultimate sanction as in domestic bankruptcy proceedings, the take-over and liquidation of the debtor entity is not available at the sovereign level.

Equity and Bond Markets

When movements in equity and bond prices are large enough, they might often pose a serious threat to financial stability. To avoid this, supervisors of financial institutions seek to ensure that firms hold sufficient capital and liquidity to meet unforeseen market conditions. If individual institutions are well-capitalized, the authorities can feel more confident about providing temporary liquidity assistance in times of exceptional market stress. Another way to ensure stability of markets is by addressing some of the underlying factors that make for excessive price volatility. Non-financial firms in countries with high and variable inflation tend to be vulnerable to economic shocks, because their debt tends to be of short duration and denominated in foreign currency. A low and steady rate of inflation allows countries to write long-term debt contracts. Highly variable inflation also reduces the credibility of policy makers, making it difficult to promote recovery from crisis. At the macro-economic level, this means avoiding abrupt changes in policy that cause economic agents to re-assess the value of debt and equity instruments. Such abrupt changes might be deemed as necessary when a unsustainable situation has been allowed to persist for long and an initial corrective move on the part of the authorities is perceived as heralding a turning point.

Real Estate

Price instability in the real estate market is a legitimate source of concern and has prompted consideration in some countries as to how it can be reduced. So long as real estate prices move pro-cyclically, they are liable to exacerbate the cycle by increasing borrowing and spending in the inflationary phase and adding to financial fragility, thus reducing spending, in the contractionary phase.

One approach is for financial supervision to encourage banks to limit the extent to which real estate collateral can be used for loans.

C. Improving the Financial Market Infrastructure

Reducing Settlement Risk

If difficulties at one institution were to threaten systemic stability, one of the most likely channels of transmission would be through the payments and settlement system. The growth of financial transactions generally means that financial intermediaries find themselves with increasingly large, though very short-term credit exposures in the payments system. At the same time, given the complexity and unpredictability of inter-bank payments flows, it becomes extremely difficult for financial institutions to form a view of the indirect exposures that they face through the settlement position of their counter-parties vis-a-vis others.

Recently, Litan (1997) has forcefully argued for moving towards Real Time Gross Settlement (RTGS) as a means to improve the safety of clearing and settlement systems. Introduction of RTGS is expected to lower the risk of one party having insufficient funds at settlement time. In fact, several authors have unanimously agreed that moving towards shorter settlement times in all markets would make an important contribution to financial stability. Realizing the significance that an efficient market infrastructure can have on financial stability, efforts are underway in countries like India in moving towards a Real Time Gross Settlement (RTGS) system with a view to minimizing transactions costs and improving market efficiency.

Improving Legal Framework

Another aspect of market infrastructure which has received scant attention in the literature is the legal framework. In developing and transition economies, there is often a basic need for workable laws on contract, collateral and bankruptcy proceedings, as well as the need to streamline court proceedings for rapid and effective remedy. But the issue also extends to developed legal and

judicial systems, because the continual state of innovation and evolution of new financial products can outrun existing legislation and raise finer points of law.

Corporate Governance

The strand of market infrastructure which is often been ignored in policy discussions is the issue of corporate governance. Corporate governance in its wide connotation covers a variety of aspects, such as protection of shareholders' rights, enhancing shareholders value, Board issues including its composition and role, disclosure requirements, integrity of accounting practices and internal control systems (Reddy, 1999). Pertinent from the point of view of the present exercise is corporate governance in the financial sector. The issue has widely been discussed and debated in India in recent times, in view of the dominant share of the State in the banking sector. In the face of tighter prudential standards, it is essential that these institutions have sufficient capital and continue to grow. They should be in a position to put in place and assure the market that their system of corporate governance is such that they can be trusted with shareholders money.

IV. Concluding Remarks

There is overwhelming evidence that financial stability provides a conducive environment for efficient resource allocation and rapid economic growth (King and Levine, 1993). Instability has often lead to lower levels of savings and investment, engendered fiscal costs and setbacks to growth. It is therefore but imperative that securing stability should be an important concern of public policy authorities.

The integration of international capital markets and the globalisation of major financial institutions has made the objective of maintaining financial stability increasingly important, but overtly complex. The network of financial relationships that link financial firms and markets together has meant that the potential for difficulties arising in a single firm, market or payment system to spread elsewhere have become manifold.

In response to an initiative at the Lyon Summit in June 1996, representative of G-10 countries and of emerging economies have jointly sought to develop a strategy for fostering financial stability. The key components of the strategy, as identified by the representatives consisted of (a) an international consensus on the key elements of a sound financial system; (b) formulation of norms and practices at par with international best practice; (c) use of market discipline for adoption of sound supervisory systems and better corporate governance.

Subsequently, the Bank for International Settlements (BIS) have been making pro-active efforts to strengthen the architecture of the international financial system. Accordingly, three key areas for policy action *viz*., enhancing transparency and accountability, strengthening domestic financial systems and managing financial crises, have been identified as priority areas for policy action. The *Working Group on Transparency and Accountability* has stressed the need to improve the coverage, frequency and timeliness of macro data; the *Working Group on Strengthening Financial Systems* identified several key areas including corporate governance, risk management and safety net arrangements to fortify the global financial architecture; the *Working Group on International Financial Crises* emphasized the necessity for better risk management by the public and private sectors and recommended a framework for orderly debt workouts between creditors and debtors and guiding principles for resolution of future crises. In this context, White (1999) has observed that Central Banks are devoting considerable amount of resources to the issue of financial stability than a decade or so earlier[i].

The International Monetary Fund (IMF) has also been making serious efforts in promoting information disclosure in international markets through various channels. Firstly, the IMF has been preparing comprehensive analytical and descriptive reports on economic developments in its member countries for its executive board and for all member governments. Second, the IMF has been producing regular statistical publications. Thirdly, since the 1995 Mexican crisis, the IMF has posted market-relevant data on the Internet through its Special Data

Dissemination Standard (SDDS) and its associated Dissemination Standards Bulletin Board. At the 1995 Halifax Summit, in recognition of the recommendations of the G-7 Governments, the IMF developed a mechanism for faster access to IMF credit and larger amounts of money to countries in crisis situations. Consequently, the emergency financing mechanism was established wherein funds could be disbursed to crisis-riddled economies in a shorter period of time.

In an increasingly deregulated world, wherein most emerging market economies have been encompassing deregulation in varying degrees, one aspect of stability which has largely bypassed the attention of observers has been the issue of timing and sequencing of reforms. It has been noted by several observers (Khatkhate, 1998, Harwood and Smith, 1998) that financial sector reform has a certain sequencing pattern built into it, which varies according to characteristics specific to each country. The sequencing of reforms that takes into account the institutional imperatives has a better chance to succeed and avoid disruptions to the financial system. Experience is indicative of the fact that even with all the sequencing and timing problems resolved, financial sector reforms needs to be preceded by the real sector reforms, good corporate governance, a firm control of the fiscal deficit as well as consistent macro-economic policies. As Khatkhate (1998) has aptly summarized it '…the structural and macro-economic policies should be delicately balanced and interwoven, with space for adjustment…'.

Recent theoretical work has greatly increased understanding of the forces making for instability in the financial system. We no longer need to rely on phychological explanations as to why bank runs occur or why financial prices move by more than what is justified on the basis of underlying economic fundamentals. This understanding of the microeconomics of financial market behaviour is an important part of the policymakers tool-kit in the search for a system that is stable enough to facilitate inter-temporal resource allocation decisions, yet flexible enough to allow prices and institutional structures to adapt

through time, and to provide a proper range of incentives for good decisions and penalties for bad decisions.

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