

Regulatory Structure for Financial Stability and Development

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Abstract

To understand the appropriate regulatory response to the crisis, we start from the basic market failures that justify regulation in financial markets. Neglecting these first principles contributed to the market and regulatory failures. Regulation that induces better outcomes through creating correct incentives for market participants is the key to reform. A combination of micro and macro prudential regulation can moderate procyclicality, information failure and market power. Better national and global coordination of regulators is also required. Global prudential standards can push financial firms to choose safe over risky strategies, by removing the moral hazard from bailouts, and assuring that a competitor is not adopting risky strategies either. Universal application of basic standards prevents regulatory arbitrage. A pure principles-based regulatory approach maybe too flexible, but principle-based rules retain sufficient operational flexibility and universality. This analysis is applied to regulation in emerging market economies (EMEs), where development of financial markets is a major regulatory goal along with stability.

Keywords: market failures; incentives; procyclicality; coordination; rules versus principles; development

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1. Introduction

Since self-regulation, expected from ethics or the instinct for self-preservation, and market discipline has not worked, world opinion is veering around to stricter regulation for financial markets. But regulatory discretion also has adverse effects. It can restrain useful activity or support special interests if there is regulatory capture. The important question is not more, but appropriate, regulation. To understand what this is, we start from four basic market failures that justify regulation in financial markets. We show how neglecting these first principles contributed to market and regulatory failures. Next, we pull together regulatory reform proposals, and regulatory structure, that could best address these failings.

The four categories of failure are excess volatility and procyclicality, information failure, exclusion, market power and size. A combination of micro and macro prudential regulation can usefully moderate the failures. For example, insurance premiums for contributions to systematic risk through size could make large size less profitable. Regulation that induces better outcomes through creating correct incentives for market participants is the key. New technology has the potential to improve disclosure and make innovation safer.

Global coordination of basic prudential standards is also necessary. We demonstrate how such standards can push financial firms to choose safe over risky strategies, by removing the moral hazard from bailouts, and assuring that the competitor is not adopting risky strategies either. Universal application of basic standards prevents regulatory arbitrage. Global regulatory bodies may be more immune from financial lobbying to relax standards. A pure principles-based regulatory approach could be too flexible, but principle-based rules retain sufficient operational flexibility while reducing the delays and capture that come with regulatory discretion. The principles on the basis of which these rules are to be designed are the categories of market failure.

Stricter regulatory surveillance in emerging market economies (EMEs) largely insulated their financial systems from the crisis. Development and convergence of regulatory apparatus has been rapid. In some respects, EMEs may be closer to new global norms. The development of

financial markets, however, is a major aim for regulation in EMEs along with financial stability. We examine the success in achieving these objectives in the Indian case. Some problems of regulatory overlap and coordination should be resolved keeping in mind the lessons of the crisis.

The paper is structured as follows: Section two presents the market failures that justify regulation; Section three the market and regulatory failures that led to the crisis; Section four the directions implied for regulatory reform; Section 5 for regulatory structure. Section 6 brings in issues that become relevant in EMEs where stable development of markets is a concern. Section 7 illustrates the analysis with the Indian experience before Section 8 concludes.

2. Justification for Regulation

2.1 General

The public interest theory of regulation defines it broadly as government intervention in markets to influence those decisions of private agents that would otherwise not fully consider public interest. Intervention is justified by market failure due to monopoly or market power, asymmetric or imperfect information, and the existence of externalities or of public goods¹. All three categories of market failure occur in financial markets.

2.2 In capital markets

The basic justification for regulation combined with the special features of capital markets, indicate the major issues for regulation in capital markets. Financial regulation serves the public interest if it ensures the integrity of financial markets and that finance meets the needs of the real economy. Thus it must maintain confidence in the financial system, and protect users. Supervision or enforcement should be distinguished from regulation. It includes operational tasks of financial regulators such as licensing providers of financial services, oversight of compliance, enforcing relevant laws, prosecuting any market misconduct, and investigating client complaints.

But, in addition the four basic market failures require regulatory intervention: failures of information and inclusion, behaviour that creates procyclicality, and the too big to fail (TBTF) syndrome.

¹ The definition follows Lee (2003). This and some subsequent sections draw on and further develop content in Goyal (2009, 2006, 2002).

Since information is incomplete and asymmetric in financial markets, informational imperfections are inherent. For example, borrowers know more about their own credit risks than lenders do, leading to adverse selection (as borrowers select transaction terms that favour them), and under-provision of credit by lenders. Moral hazard may also occur with borrowers undertaking riskier actions than the lender had agreed to in the loan terms. Issuers of financial instruments know more than institutional investors, each of whom have heterogeneous information sets. Retail investors have the greatest relative information disadvantage. Therefore regulations enforcing transparency, disclosure of price sensitive information² and conflicts of interest, and encouraging organizational forms that reduce, or offer protection from, these hazards add value. Better information, including credit histories of borrowers, and one point credible information on investment options, with technology-enabled ease of access is important for financial inclusion.

Information is costly to produce but new technology is making it cheap to reproduce. This creates an externality leading to the underproduction of information. Stock market crashes can also be understood as an externality, since wider participation or high liquidity implies that the costs of price discovery or information production are shared. But during a crisis each participant has an incentive to withdraw and let others bear the burden of price discovery. To reduce such shirking, the regulator should link charges to the liquidity cycle (Wilhelm, 2001).

This points to the basic externality in financial markets. The action of one agent infects others; a failure of financial systems affects the real system, causing cumulative crashes. But decision makers in finance do not internalize these possibilities. Individuals follow each other, rather than fundamentals, creating a tendency towards excess volatility. Wide swings in financial prices result from this herd mentality. Risk is underpriced in a boom, while liquidity dries up in a crash. Inherent network effects, where the value to any one individual rises with the number participating, leading to effects such a rapid tipping to a particular product or institution, or a lock-in into it, so that it becomes difficult to switch products, enhance such externalities. Therefore ensuring financial stability by reducing volatility, the pro-cyclicality of returns, and mitigating systematic risk, are major tasks for the regulator. The debate is whether this is best done through oversight, or through capital requirements that change incentives.

² European jurisdictions mandate disclosure of price sensitive information as a general principle. In the US disclosure was required in response to specific events. A wave of corporate and securities scandals revealed gaps such as insufficient enforcement of disclosure requirements, excessive reliance on peer review for auditors, and inability to keep brokerage and investment banking activities separate. The Sarbanes-Oxley Act passed as a consequence mandated more disclosure.

Monopoly or anti-competitive features arise through the network effects that dominate in the industry, and the formation of various insider groups or financial cartels. There is a tension for the regulator between discouraging size and encouraging the innovation it sometimes makes more feasible. Vertical integration may be necessary to save transaction costs under asset specificity. The Austrian School emphasizes that dynamic monopoly profits may be necessary for innovation—waves of creative destruction destroy these in time. But mergers can make financial institutions too large. Systemic effects from their failure force a rescue from the government. So financial regulators must find ways to encourage entry and also innovation.

Being too big to fail (TBTF) encourages risk-taking. Home country taxpayers are lumped with the rescue and foreign countries with adverse spillovers. Oversight and insurance premiums linked to potential systemic spillovers can lower moral hazard. Large institutions also escape regulation since they operate across nations. International regulatory coordination and harmonization are required to prevent regulatory arbitrage.

3. Post crisis: Market and Regulatory Failure

But both regulators and markets forgot these failures as they bought into the dominant paradigm of efficient and rational markets where failures do not occur. Turner (2009) lists the implications of this paradigm for the regulatory approach followed. First, market prices give economic value. Second, market discipline constrains harmful risk taking. Third, market competition weeds out unproductive innovations. Therefore it was thought securitized credit would create more liquid, diversified and stable markets. Mathematical models were presumed to provide robust measures of trading risk.

But market discipline did not work. Although the securitized OTC markets were opaque there was considerable information available in the US public domain on subprime exposure. By late 2007 it was clear that a number of banks were poorly capitalized. Yet investors did not use this information to value and discipline banks (Pomerleano 2009). The paradigm and its implications did not hold. But there was regulatory failure also.

The performance of regulators with respect to the basic market failures identified was inadequate. First, disclosure on complex derivatives and risk taken was poor. Better disclosure was not enforced. Even so, ample warnings were available but were not used to design an effective response. On-site examinations were not conducted.

Second, the regulatory regimes enhanced the procyclicality of financial systems. Basel I encouraged off-balance sheet instruments. The post Enron 2002 Sarbanes Oxley Act allowed

off balance sheet activities so long as other entities held the risks and rewards, thus also encouraging the “originate and distribute” model. US politicians wanted to expand home ownership so the Community Reinvestment Act was amended in the mid-nineties to allow securitization of sub-prime mortgages, making home loans possible for low-income categories. Inclusion is important, but this was a flawed design, based on a naive assessment of ever-rising home values.

The Commodity Futures Modernization Act of 2000 exempted credit default insurance from regulation by calling them swaps. Basel II allows capital adequacy below 8 percent through the use of internal risk models, based on market prices. Self-regulation based on such an internal price of risk, enhances pro-cyclicality. These models guide movement into sectors offering better risk-return trade-offs. But players have similar aims and information. Volatility and correlation increases and prompts concerted model-driven selling. The basic assumption of statistical independence underlying risk-sensitive models does not hold if everyone uses them in markets prone to fail. Modern mark-to-market accounting rules and dynamic hedging deepen these cycles (Goyal, 2009). The Basel Committee spent 15 years to produce a form of regulatory forbearance where firms make the above type of obscure and complicated capital calculations yet do not reduce risk adequately. The failed institutions were Basel II compliant. Both capital and supervision were inadequate.

What were the reasons for this regulatory failure? It was partly ideology—the belief in market efficiency and self-regulation. Influential regulators such as Greenspan believed stronger regulatory oversight would damage innovation since the lawyer is biased towards preventing activity. The pervasiveness of ideology illustrates Keynes’ view that behaviour is based on the dominant opinion even if it is wrong. It is safer to think the same (Pomerleano, 2009). But also the share of the financial sector in US business profits has crossed 40 percent. US comparative advantage was largely in finance, generating political support for finance driven growth. Tighter regulation has a cost in terms of compliance and innovation foregone. Although the US system is rule-based, lawmakers relaxed the rules, and regulators relaxed oversight to encourage competitive innovation.

The TBTF size of financial institutions allows them to pass on the risks they take to the taxpayer. Regulatory capture comes not only from ideas, but also from the wallet. Financial corporations spend huge amounts in lobbying regulators and politicians³. Regulatory agencies

³ US financial, insurance and real estate industries spent a record amount of nearly \$460 million in lobbying activities in 2008, according to the political watchdog group, Center for Responsive Politics.

come to represent special interests. Public interest functions as a fig leaf hiding group interests.

4. Directions for Regulatory Reform

What are the implications for reform? The energies and freedoms of markets must not be choked but ground rules must turn the energies in safer directions. Pendulums tend to swing from one extreme to the other, but they do modulate over time. The pro-market swing was a reaction from the extreme swing towards government control of markets. The crisis may help discover the right combination of regulation and markets. Regulatory discretion invites excessive restraints, corruption and regulatory capture. But rules need to incentivize better behaviour, moderating the basic market failures identified. A complex enough rule can be closer to a principle-based approach, yet reduce delays and regulatory forbearance. If a regulator is first expected to prove a market failure before intervening, as in American competition policy, it can take too long.

There are many good reform suggestions that can be classified as principle-based rules. Prudential regulations all have this character. The principles causing market failure motivate their design; they work by aligning the incentives of agents with those of regulators, and give some flexibility in adapting to context. But they are rule like in being triggered by objective criteria (for example, prompt corrective action clauses), reducing regulatory discretion and delay. Consider reform proposals for non-transparent and risky securitized products, which played a large part in the crisis. If loan originators retain a small percentage of a securitized loan on its own books, they have incentives to create safer loans. Tailoring retention percentage to the type of product could reduce costs. Relating securitizer compensation to the long-term performance of the loan would also reduce incentives to give risky loans. If securitized products are simplified and standardized and traded or at least recorded in exchanges, liquidity and price discovery improves. There is a better idea of outstanding risks. This, together with disclosures of materially relevant information improves transparency (IMF 2009). These are all examples of micro-prudential regulation creating better incentives.

But such micro-prudential regulation cannot alone deal with the systemic risks created through individual behaviour. Macro-prudential regulation through counter-cyclical capital charges would reduce the decline in measured risk during booms and its rise in crashes. Brunnermeier et. al. (2009) suggest capital adequacy requirements should be raised over a cycle when there is above-average growth of credit expansion and leverage, and wherever there is mismatch in the maturity of assets and liabilities. Thus institutions borrowing short and lending long would need higher capital reserves. Mark-to-market procedures that enhance

procyclicality also need to be changed. Moderating market cycles of greed and fear can reduce externalities. Special capital penalties, oversight, and insurance premiums, on TBTF institutions will create disincentives for marginal contributions to systemic risk. Competition policies may aim to prevent firms from getting too big. Concentration margins could be charged for banks that lend predominantly to a closed circle of big finance.

There are strong cross-border relationships between institutions and markets. Improved international coordination is important since finance flows across borders and can arbitrage weak spots or differences in regulation. Also unilateral actions of regulators have consequences for others. The roles of home and host authorities have to be clarified. Counter-cyclical regulatory policy needs to be implemented mainly by the "host" rather than the "home" country, since cycles differ across countries. But general standards need to be harmonized, while retaining operational flexibility. Such harmonization prevents regulatory arbitrage and competitive risk taking.

A simple game model⁴ below shows why regulatory rules and standardization would help reduce procyclicality and increase the stability of the financial system. Table 1 depicts the actions, equilibria, and payoffs. The first number is the payoff to a bank from its operations in a country, the second to the country. Note that the payoffs are to the country, but a regulator takes the action. Consider the first two columns of payoffs. In a situation where a country is overheating the bank can make *risky* or *safe* loans; the regulator can either *do nothing* or make emergency funds available under a *bail out* in case of a crisis. As the arrows show there are two *Nash equilibria*, the first where the bank selects to make *safe* loans and the regulator does not have to take any action, and the second if loans are *risky* and there is a *bailout*. But if the bank moves first to choose the type of loan, it will make risky loans because of the moral hazard created by a bailout, and the higher returns it may earn. The unique *Subgame Perfect Nash Equilibrium* then is (8,3).

Table 1: The Effect of Regulation on Risk

Regulator/Country

	No action	Bailout	Capital Charge
Bank	Safe (7,4) ↑	(7,4) ↓	
	Risky (9,0)	(8,3)	(5,2)

←→

→

→

⁴ The game is adapted from one used in Goyal (2002).

If the bank moves first, the regulator is forced to *bailout*, because the outcome with no action (9,0) is so bad for the country. The same outcome, a crisis and a *bailout*, can be expected in future. But if the rules of the game are changed to introduce countercyclical capital charges, column three of payoffs replaces column two. In this game the bank will prefer to make *safe* loans. The capital charges make the bank's payoff relatively higher under safe loans. Now the unique Nash equilibrium is (7, 4), with the creditor making *safe* loans and the regulator *doing nothing*. Both country and creditor are better off. Therefore, if such regulatory rules are adopted, the probability of a crisis falls. Now consider a number of banks choosing between the strategies. Competition among banks forces the choice of risky strategies. That is why external regulatory standards are so powerful. If a bank is assured its competitor will not choose risky strategies that may allow it to make more money, it will not choose those strategies either.

5. Regulatory Structure

The above section points to the requirement to harmonize regulations across countries. But coordinating regulation of financial activities is a problem even within a country. A few countries have a single umbrella financial regulator. Others have sector specific regulators for banking, securities, derivatives, commodities, insurance and pensions markets. There can be overlap⁵, with an industry reporting to more than one regulator. For example, in the US, banks report to multiple regulators. Post crisis, functional twin peaks regulation with a separate prudential or macro risk regulator is becoming popular.

Although information is split with multiple sectoral regulators, specific information and responsibility is better. Creating an apex regulator, such as the FSA⁶ in the UK, carried out in 2000 before the crisis, was implicated in the failure of Northern Rock in the UK. Since the Bank of England was no longer responsible for banks and information available with it was reduced, it was late in providing lender of last resort (LOLR) facilities. But Bear Sterns failed in the US where there are multiple bank regulators including the Fed. Thus problems have occurred under every type of regulatory structure.

⁵ US financial reform would split responsibility for derivatives between the SEC and the Commodity Futures Trading Commission. The SEC would oversee derivatives based on individual securities and the CFTC would regulate derivatives that draw their value from a broader index of securities. There are fears that this could vitiate regulation of the \$450 trillion private swaps market.

⁶ The FSA is incorporated as a company, funded by fees from those it regulates. So the principles of good regulation for it include reducing regulatory costs, increasing innovation and competitiveness of the UK industry. Its principle-based approach includes general ethics, but there is nothing about market failure.

Macro- and micro-prudential regulation each requires different skills and information. The best alignment of information and incentives occurs if Central Banks (CBs) are responsible for macro-prudential regulation, sectoral regulators for micro-prudential regulation, and there is good coordination between the two.

Maintaining monetary stability also requires financial stability. Formal oversight authority over banks and markets generates information for CBs useful in the conduct of monetary policy. FX and interest rate derivative markets affect variables important for the conduct of monetary policy. Analysis undertaken for monetary policy is useful for macro-prudential tasks. CBs have become crucial for the financial sector in their role as lenders of the last resort. The crisis has forced them to expand this function beyond banks, as the financial sector has diversified, its interlinkages thickened, and ability to expand balance sheets procyclically and create risk expanded. More power for the systemic risk regulator must come with more responsibility.

Micro-prudential supervisors also have an essential role since they have detailed knowledge of financial markets and institutions and will have critical information to assess stability risks. The macro-micro regulatory split has a functional basis. An apex body must not be a financial market regulator like the FSA, which would tend to support financial sector competitiveness and profitability, but a body for coordinating and sharing information led by the systemic risk regulator.

The European Union (2009) has come up with just such a proposed structure for Europe. A macro-prudential regulator, the European Systemic Risk Council (ESRC), will assess threats to financial stability and reduce vulnerability to interconnected, cross-sectoral systemic risks. It will be made up of governors of national central banks and representatives of financial market supervisors, with the president of the ECB as chair. A similar systemic risk body is possible at the national level.

Micro-prudential supervision will be provided through a network of national financial supervisors working with a European System of Financial Supervisors (ESFS) to safeguard individual financial firms and protect consumers of financial services. Since the pressure from cross border flows is higher in Europe, this bipolar system had been put on the fast track with draft regulation already prepared in 2009.

The nationally based supervision of firms, with centralization of specific tasks at the European Union, is expected to foster harmonized rules. While there are obvious advantages

to standardization there are fears over giving too much power to the ECB over national supervisors, possible prescription of detailed supervisory practices, and loss of national priorities in financial services and banking arrangements. But principle-based rules retain operational flexibility. For example, a rise in capital adequacy, linked to the stage of the cycle (a sharp rise in credit is normally a good indicator) would have to be implemented by the domestic systemic regulator. Implementing micro-prudential standards in financial markets such as prompt corrective action linked to banking parameters is a task for a local sectoral regulator. Principle-based rules avoid regulatory intervention in operational decisions of firms

Financial conglomerates prefer a single regulator, which offers reduced compliance costs and an easier target for lobbying. They also prefer the apex regulator to be an FSA rather than a Central Bank, since the former would tend to have more of a market rather than an overall view. Prabhakar (2009) writes politicians are motivated to prevent systemic instability and attract foreign firms to their country's financial sector. They also seek to avoid blame. Therefore financial scandals and crises may lead to assigning blame to the CB and removal of supervisory authority from it.

But CEOs, for example John Mack of Morgan Stanley, prefer a global regulator to oversee financial institutions worldwide, since a standardized systemic-risk management would ensure that US banks aren't subject to tighter regulations than the rest of the world. Credible uniform standards are very useful to prevent a competitive race to take more risk, as we saw in the game theoretic example. But given the vast lobbying power and resources of the financial industry the fear is rather that US banks will continue to be lightly regulated. The administration's 2009-reform plan was inadequate since it did not build in countercyclical macro prudential rules, or resolve problems of regulatory overlap. And, under lobbying pressure, it was further diluted⁷. Electoral losses forced the President to propose caps on pay and restrictions on trading for deposit taking banks.

Global enforcement of some minimal standards together with local operational flexibility is desirable. Global bodies, with a diverse and representative governance structure, could be more immune from financial lobbying and domestic political compulsions, and as we argue below, and their involvement is a natural evolution of regulation. If officials have to follow a rulebook, then interest groups have less of a stake in the decision and therefore less incentive

⁷ For example, a requirement offering customers alternatives to complex financial products was dropped. It would have forced banks to make standardized mortgages with 30-year fixed rates available along with other products such as adjustable-rate or interest-only loans.

for regulatory capture. This is one reason transparent rules that minimize discretion are used even though some flexibility is lost. The alternative is to raise the cost of subversion.

6. Regulation and Development

Although financial stability is very important to them, EMEs also have to develop their financial systems. What type of intervention is best may depend on the level of development. In mature economies regulation replaced early reliance on private litigation in cases of failure of public interest, although judicial intervention could still be called in to resolve disputes.

Glaeser and Shleifer (2003) in considering the choice between private litigation or regulation or a combination of the two as a law enforcement strategy, argue the vulnerability of each of these categories to subversion for private gain varies with the level of development and inequality in a society. At low levels of development the system of justice is extremely vulnerable to influence, but at high levels it becomes robust. Therefore, rather than have the heaviest government intervention when market failures are relatively more, as is commonly argued, both legal and regulatory systems should be minimal at this stage. The costs of regulation may be high, or regulatory agencies may be mismanaged. Human capital or information on the public's requirements may be poor. A combination of regulation and of litigation may be efficient in intermediate regimes, since regulation may now be less vulnerable to subversion than is litigation. High costs of damage overwhelm those of regulation at this stage. When law and order is weak, and inequality is high, private litigation based pure liability regimes, which entail large payments with small probability, are more vulnerable to ex-post subversion⁸. At high levels of development, a litigation regime would outperform regulation. The cost of corruption is highest for International litigation—so international judicial oversight would be the most immune to lobbying. The WTO has a credible and effective enforcement mechanism. An agreement signed against more regulation of financial services is a block now that the requirement for regulatory overhaul of the financial sector has become obvious, and WTO could be useful to enforce standards.

Many EMEs are in the above intermediate range where regulation is more effective compared to law, and are actively setting up new regulatory structures. La Porta et. al. (1998) argue that a common law tradition is necessary for healthy equity markets. But China can set up a good regulatory institution faster than it can acquire common law—thus regulation can compensate for other weaknesses.

⁸ In the US progressive era (between 1887 and 1917) the large corporations or “robber barons” had judges in their pockets. Therefore reformers established the state regulatory agencies.

The issue for EMEs is more of converging to best practices. Standard-setting organizations such as IOSCO (International Organization of Securities Commissions), and international bodies of regulators, such as the Financial Stability Board, can help. But since many EMEs are coming from a regime of stronger controls they have more oversight and surveillance of the financial sector. Post crisis, some of the international standards may be adjusting more towards EME's practice. Convergence can be faster if principle-based international standards are adopted.

Moreover, contextual features require attention. EME concerns such as excessive leverage and volatile capital flows need to be addressed. IOSCO's stance is that adoption of international standards and accounting systems will help to deepen shallow debt and equity markets, changing the historical reliance on banks. But in Asia only a small percentage of large household savings are held in stocks. The history of bank led relationship-lending leads to the dominance of insiders; there is a tendency to accommodate and adjust rather than punish behaviour on the margin of illegality. In the Chinese stock exchange there are a large number of non-traded shares mostly owned by the State, with insider trading dominating in the thin set of shares actively traded. These features limit protection for investors. Better investor protection can reassure households, but other positive measures are also required.

Laffont (2005) argues that poor monitoring in developing countries limits the power of incentives that regulators of public services can give service providers. But technology is changing this quickly, especially in financial markets, making it possible to give market participants more economic incentives with improved real time but non-invasive monitoring.

Changes in technology have had fundamental effects on the possibility of regulation, and on safe innovation. India used new technology effectively to create electronic markets reaching and sometimes exceeding international benchmarks in disclosure norms, trading volume, settlement cycle, and low transaction costs. In the order driven system, each investor can access the same market and order book, at the same price and cost, irrespective of location. Dematerialization of securities reduced bad paper risk. There were rapid developments also in FX and money markets. A central counterparty, CCIL (Clearing Corporation of India) undertakes guaranteed settlement for government securities (G Secs), repos in G Secs and FX market trades, following IOSCO/CPSS best practices. Infrastructure has been created for electronic payments and real time gross settlement (RTGS). Technology has been underutilized for financial inclusion, however, although it has great potential for reducing costs, easing entry and exit, and providing better information on fundamentals. Mobile

banking may make it possible for more than the current 40 percent of households to have bank accounts.

Principle-based rules addressed each of our four market failures, with some success, although further improvements are required.

Disclosure: Strict norms regarding disclosure of price sensitive information, and conflicts of interest, contribute to reducing asymmetries of information and aid the markets in price discovery. Technology allows instant registration of price sensitive information and of financial results. Better corporate governance reduces asymmetries of information between management and shareholders, improves incentives for complying with rules and reporting requirements, and reduces conflicts of interest. Statutory requirements call for one-third of directors to be independent. They have to periodically review legal compliance reports and steps taken for any correction, and to reveal any non fee-based pecuniary connection with the company.

Volatility: Price bands, value at risk (VaR) margining systems, SPAN, circuit filters, exposure limits and suspension are all used to curb volatility. These allow adjustment for risk to be individually specific and therefore less inefficient than a common margin, while achieving the desired result of putting concave boundaries on convex returns, thus reducing one-way price movements. Margins that vary with liquidity are required in response to the externalities that follow from herd behaviour in capital markets. Moreover, such margins reduce deposit requirements and therefore lower costs of trade. A daily mark-to-market margin system prevents large risks from building up, and lowers the possibility of a payments crisis.

Margin requirements are adjusted in response to episodes of volatility, or changing market systems. A market wide circuit breaker can be applied at 3 stages of index movement either way at 10 percent, 15 percent, 20 percent, to bring about a coordinated halt to trading. In times of excess volatility, surveillance systems are put on high alert. Other measures are possible like shifting stocks to trade-for-trade category. VaR alone cannot cover systemic shocks, which can force margin sales that intensify index movements. But the other supporting systems proved sufficient to handle even shocks associated with the global crisis. Although many banks failed no stock exchange had to be closed. SPAN covers fat tailed risks, and worst-case scenarios, unlike the VaR.

Inclusion: Although financial inclusion is a major aim, the reforms have not been so successful in this. Household financial savings in shares and debentures prior to reforms was

above 20 percent, but post-reform reached a low of below 5 percent. Technology actually raised entry costs, for example depository charges. Mutual funds through which retail investors were supposed to enter are more interested in servicing corporates and few high net worth individuals through high cost structured products. The sub-brokers that households trusted disappeared from the markets. Only about a hundred large cap stocks have reliable liquidity, and small enterprises are excluded from the markets and the credit system. A broader base with trade at different horizons will make markets more stable, but the issues of entry, exit costs, and different types of risk, have to be addressed. Given the potential size of retail participation a low margin, high volume strategy has great potential.⁹ Means to achieve this include: improving financial literacy of investors through education; providing them one point disinterested information; credit histories for lenders; registration and rating for agents; reestablishing trusted technology enabled sub brokers with local knowledge; promoting simple transparent low cost instruments such as index funds.

Competition: Cautious entry provided competition, reduced market shares and improved services. The entry of private banks helped force public sector banks to improve profitability and customer services but limitations on entry maintained a robust diversity of systems. Indian stock exchanges multiplied from one to three. The rapid dominance of the Indian for-profit, fully automated NSE promoted by leading banks and financial institutions (mainly public sector), over the powerful traditional Bombay Stock Exchange (BSE), which was also forced to automate, and the collapse of all other small stock exchanges through the country, demonstrates tipping equilibria. Stock exchanges were always subject to network effects because of liquidity –the exchange with more liquidity could tip in customers and lock them in because of lower transaction costs. In the days of floor trading the advantage went to the greatest geographical clustering of financial intermediaries. But with ICT geographically dispersed intermediaries can provide liquidity. The exchange with the best technology is able to attract the most customers. The government ability to sponsor a new technology had a powerful effect in an industry with network effects. Moreover, technology affects the governance structure of exchanges. NSE is a company incorporated under the Companies Act (1956), and makes a profit. The management is independent of the broker members. The official view is that this allows a fair, equitable and efficient market to develop, free of the conflict of interest experienced in broker run exchanges, but our analysis suggests that governance structure follows from technology. With distant participation, an exchange cannot be run like a club. The tipping was so successful that NSE became too dominant and began making large profits. More competition through easier entry of other exchanges and central

⁹ A major marketing success in consumer goods was the low denomination shampoo sachet. A similar innovation is required in financial products.

counter party services with newer technologies and better systems is required to bring down transaction fees.

Governance: The earlier no-profit club of intermediaries that through a self-regulating system of committees, rule-making processes and voting mechanisms, distributed the rent among heterogeneous members did not work with dispersed membership. Internationalization intensifies the latter. Since with new technology liquidity comes through numbers, there is no need for the earlier exclusivity. Since profits help in improving technology, which is now the main avenue of competition, modern exchanges are organized as for profit corporations. (Pirrongo, 2003). Insider groups generate rents as well an incentive to trade. So there were initial arguments against anonymous electronic trading—knowing the counterparty is important if participants are heterogeneous. But they lost out as clearing corporations were created to absorb counterparty risk and guarantee trades. Replacing Badla, the old system of carry forward trade without delivery, by modern forward and future derivatives was quite smooth. Experience with Badla may explain why India now has the highest volume in single stock futures.

Flexibility: Principle-based rules give enough flexibility to adjust to emerging trends and local requirements. There were many instances of flexibility and learning in regulatory action. For example, norms for private placement and participatory notes were changed in response to arbitrage. In 2009 trading hours were extended for exchanges in response to market demand.

Innovation: There is ceaseless innovation in the financial sector. But principle-based rules that reduce procyclicality would encourage safe innovations that increase transparency and stability. Technology can also contribute in this. Post crises there is a move to encourage standardized contracts that would be cleared and traded on exchanges or via a swap execution facility. Even OTC derivatives trading should be through central counterparties. Reporting and netting reduce risks. Customized OTC contracts would face higher margin and capital requirements. Clearinghouses require cash reserve. Users of OTC normally pledge assets, but not cash in swaps deals, and are resisting the additional costs. But alternative credit arrangements could be developed with members of clearinghouses.

In financial services, technology allows the diffusion of information to be increasingly mechanized and taken over by large firms, while human capital is released for innovation. But although the ease of flow of information has increased, the governance structures that maintained an incentive for its flow have yet to change. Earlier exclusive yet transient groups such as investment bankers managing an issue served to reduce free riding, make reputations,

and create and share rents. Differential information is also a source of trade in markets. But the areas in which such groups survive are shrinking, as technology takes over mechanized functions. Book building for a new issue continues to be one such area. Since the speed of diffusion of new ideas is much faster, new ways of profiting from them have to be discovered. Among these are financial patents and buying equity into implementations of new ideas (Wilhelm, 2001). Since patents can be used for unproductive blocking and defensive purposes, superior sales and service, lead-time and secrecy work better than patents to appropriate returns from innovation.

Moreover, for a rise in competitive pressure to increase the speed of technological progress high knowledge-diffusion is required, because the follower has a higher incentive to innovate. With low diffusion, competition may even decrease innovation and growth. Therefore patents should be granted only when costs of development are very high compared with the cost of adoption; they then spur creativity. But patents should be avoided when many small sequential innovations lead to an invention; they would then raise legal and licensing fees too high and discourage creativity (Goyal, 2006). And the regulator should encourage competition, diffusion, and inclusion more than complex and risky products.

Regulatory arbitrage and financial innovations occur and are copied with such speed that the regulator often does not have enough information to act. Under both discretion and pure principle-based regulation response time is slow. The regulator should therefore set and implement rules of the game that improve incentives, yet reduce decision time.

7. Indian Regulatory Structure

The Indian financial sector was healthy through the global financial crisis. Even secondary effects through a real sector affected by outflows and a fall in trade were minimal. But there is a debate whether a crash was avoided because a road had not been built or because traffic policing was good. Regulators used a combination of restrictions, supervision, and incentives with a wary eye on market failure. Controls had been reduced with steady market development. For example, in the regulation of the capital account replacing “old and cumbersome administrative procedures” based on multiple discretionary approvals “by a rule-based system largely based on self-certification” was very successful (Jalan 2005, pp. 197). But restrictions continued for complex financial products, reflecting regulatory concerns to increase the hedging percentage of market activities. One of the parties entering into an OTC contract had to be regulated by the RBI. Guidelines on securitization imposed conservative capital adequacy requirements on exposures. Transactions in credit default swaps were

restricted to entities hedging credit exposures. Innovation in products and markets was slow. The road had been built, but with speed bumps

The experience of scams in the securities market, and involving a non-bank financial company (NBFC), a cooperative bank, and a commercial bank, after the nineties reform, led to a strengthening and extension of supervision and prudential norms to cover NBFCs. Given large capital flows there was a regulatory focus on systematically important non-deposit taking NBFCs and financial conglomerates. Thus the scams pushed the regulators towards universal regulation, and towards closing the regulatory loopholes that plagued mature financial markets. Cross border flows across several regulatory jurisdictions led to initiatives for regulatory coordination across borders.

But most prescient were the macro-prudential regulations implemented much before their worldwide recommendation today. Countercyclical provisioning and differentiated risk weights for bank lending to bubble-prone sectors, such as real estate and equity markets, created incentives to moderate risky behaviour. Conservative accounting standards, without full mark-to-market requirements, did not permit recognition of unrealized gains in equity or the profit and loss account, but unrealized losses had to be accounted. Banks were required to mark-to-market their investments, but only those held in trading categories. They had to provide for the net losses while ignoring net gains. Any profits on sale of assets to a special purpose vehicle, were to be recognized only over the life of the pass through certificates issued, not immediately on sale (Reddy 2008). A system of Prompt Corrective Action for banks based on capital adequacy, non-performing assets, and return on assets parameters gives an example of principle-based rules. All these reduced pro-cyclical incentives. As banks get ready for Basel II there is an emphasis on stress tests to compensate for weakness in risk models.

India has a number of financial sector regulators: the Reserve Bank of India (RBI) who is also the regulator of banks, the Securities and Exchange Board of India (SEBI), insurance regulator IRDA, the commodity futures trading regulator, and the interim pension regulator PFRDA.

Financial stability became an explicit objective of monetary policy after the Asian crisis. Stability is especially important in a country with a large no of poor without the diversification to withstand risk. A 2006 amendment to the RBI Act expanded its regulatory powers beyond banks to cover the financial system as a whole and to give directions to all agencies active in markets. The Rajan (2009) committee wanted functional restructuring of

regulation, based on activities rather than agents. It recommended all regulation of trading to come under SEBI, the capital market regulator, with jurisdiction for the RBI over all deposit taking institutions. But the RBI's broader regulatory responsibilities contributed to protecting the financial sector during the crisis; they provided information and created a sense of ownership that encouraged preventive measures. A narrow regulatory jurisdiction can lead to neglect of the big picture and of other financial sector components. There was synergy between monetary policy and regulatory responsibilities over many market instruments. OTC derivatives, traditionally regulated by the RBI, impact the financial health of banks; money and G Secs markets, FX and interest rate futures are important for monetary policy. Post crisis the functional criteria that should dominate the division of regulatory responsibility are financial stability and systemic risk—with the CB coordinating sectoral regulators. The CB as the LOLR has to have the largest role in monitoring sources of liquidity risk. In a market based system this can arise from many entities apart from banks. Ultimately it is the government's tax base that supports the LOLR function, and regulators have to minimize the burden on the taxpayer.

Overlap may create more regulatory ownership, but unclear demarcation of responsibility between regulators can lead to either over or under regulation. Each may pass responsibility to the other, or delays may raise costs¹⁰. There may be gaps in the covering of all systemic risks. Industry has to deal with many regulators. The answer is better co-ordination among regulators.

A High Level Coordination Committee for Financial Markets (HLCCFM) was formed in 1992 in response to regulatory arbitrage to monitor systematically important institutions. It is an informal panel, with no statutory cover, of independent sectoral regulators (RBI, SEBI, IRDA, PFRDA) and the finance secretary. As in the proposed EU system, the CB governor, the systemic regulator responsible for overall financial stability, chairs it. Meetings are regular but without any fixed schedule. There are technical sub-committees for operational issues. So far it has coordinated well only during crises. For example, the information on a liquidity crisis facing mutual funds following the Lehman Brothers' collapse was with SEBI but RBI had to take the action. Even so, the crisis was addressed in just over six hours over mobile phones and SMSs between the regulators. RBI opened a special finance window for mutual funds.

¹⁰ There are turf wars. IRDA has shot down a proposal to register all financial advisors with the Financial Well-Being Board of India (FINWEB), an agency to write rules on the common minimum standards for sellers of insurance, pension and mutual fund products, as a fall out of an attack on Unit linked insurance plans by mutual funds that compete with insurers. Currently, IRDA has powers to license insurance agents and brokers.

But overlap¹¹ and unclear allocation of responsibility for markets between the RBI and SEBI has contributed to delays in the development of corporate bond markets, and derivative products in money and bond markets. Thus although corporate repurchase options (repo) is a money market instrument, CCIL, the central counterparty promoted by RBI, will not report it, in order to avoid regulation by SEBI. At present SEBI regulates the repo but RBI determines the instruments. There were long delays in implementing committee reports pertaining to these markets. The risk systems in CCIL, given the RBI guarantee, may not match those in stock exchange clearing corporations regulated by SEBI. These coordination problems should be resolved from the systemic risk perspective.

The HLCC was set up in response to a crisis, without a well thought-out structure and function. It can be strengthened instead of replacing it by another formal apex regulatory body. Legislation can mandate the objectives of systemic stability and market development¹². It can plug regulatory gaps and assign responsibility with clear time lines to fulfill the objectives.

8. Conclusion

Identifying and applying the basic market failures in financial markets proves useful in, evaluating reform proposals after the crisis. Emerging markets need financial development along with stability. We evaluate India's experience in terms of the basic principles, and identify major successes and potential improvements. Among the first were minimal fallout from the crisis, the use of macro and micro prudential regulation and oversight that are being generally advocated today. New technologies and innovations also contributed to developing many markets. But lacunae remain in inclusion and in market development, and we argue that better use of technology, regulatory coordination, allocation of responsibility, and goals that include stable market development would help to overcome these. Crisis lessons for emerging markets are to give priority to the development of domestic markets, ensure stability by paying attention to incentive structures and macroeconomic systemic effects, and rely on competition and technology to improve inclusion.

Regulation has to find a via media between the detailed operational rules, such as permissions for salaries and fees, inherited from control regimes and principle based regulatory

¹¹ Other examples of overlap arise in the regulation of cooperative banks. Along with SEBI, the Department of Company Affairs is also responsible for debentures.

¹² EPWRF (2009) suggest creating a Financial Market Development Agency reporting to the Government as in New Zealand.

forbearance relying on self-regulation. Principle-based rules can help create correct incentives, and encourage market functions, while moderating market flaws. Then regulations would be followed in spirit not only in letter. Regional coordination would be easier, even while practice can be attuned to country specific features.

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