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The Road to Re-Regulation: Repainting the Center Line and Erecting more Guardrails

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**THE ROAD TO RE-REGULATION:
REPAINTING THE CENTER LINE AND ERECTING MORE GUARDRAILS**

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I. INTRODUCTION

Many have attributed the latest crisis to poor regulation, though an inability to enforce existing regulation and supervisory guidance and a lack of recognition of the need for systemic risk regulation were likely more important contributing causes to the current situation.² This paper examines the need to return to “first principles” for financial sector regulation—that is, a review of why and when regulation of financial intermediaries is needed and how it can be successful. While this should help to place the financial sector in a better position to weather most shocks, it is not likely to be sufficient to stem rising systemic risks. Thus, it will be necessary to extend the scope of traditional regulation to better adapt to the increased exposure of the financial system to systemic risks.

First, it is worth reviewing why regulation and supervision are needed in the financial sector to begin with, and when regulation can be expected to help, rather than hinder, the optimal functioning of financial systems. Regulation is often needed to “fix” market failures. What do we mean by market failures? Usually we refer to situations in which the assumption of “perfect markets” is not achievable or unlikely to be realized. Policymakers then need to consider why these assumptions are not attainable. Also, policymakers need to consider whether intervention through regulation or supervision is likely to be able to rectify the situation or whether it will, in fact, cause so-called “unintended consequences” that cancel out its effects. In the context of the financial sector, this relatively traditional view of regulation usually is focused on “micro” regulation, typically imposed on financial intermediaries and investors.

Looking at this “micro” view of regulation, what types of “market imperfections” did we witness in the run-up to the crisis? Several come to mind.

- Lack of transparency
- Excessive asymmetric information
- Lack of large numbers of buyers and sellers
- Principle agent difficulties

While there may be others, this set of issues is aimed at the functioning of individual markets, their role in distributing resources efficiently, and prices reflecting all available information. It is not self-evident, however, that regulation is warranted to assure that market functions perfectly, though it is often employed in this fashion.

² Other contributing factors include failures in private sector risk management systems and governance, relatively loose monetary policy, and the environment created by global current account imbalances.

Another element of the latest crisis has less to do with the micro view of regulation and more to do with “macro” regulation. What we have witnessed is a situation in which the collective behavior of market participants, even if seemingly satisfying various underlying assumptions about the proper functioning of markets, led to dysfunctional outcomes at the aggregate level. In short, we have witnessed the realization of systemic risk—either in the form of distress or failure in one institution having broad effects on the health of other institutions or in the actions of market participants causing market disruptions, such as dramatic price changes often accompanied by an absence of liquidity. Such non-linear effects have threatened, and continue to threaten, financial stability.

Systemic risks represent negative externalities, such as, for example, individual actions that do not account for the prospects that collectively their actions are destabilizing for the system as a whole. The reasons for such collectively dysfunctional behavior can vary. In some cases, the rational use of risk management systems or market practices (such as stop loss orders) can lead to collectively destabilizing price changes. In other cases, herding behavior or “irrational” behavior can lead to extreme price moves. The general method of dealing with externalities is to force them to be “internalized” by the participants. Designing regulation to account for the “individually rationally but collectively destabilizing” is possible; designing regulation to offset seemingly irrational behavior is more challenging. Thus, new “macro” regulation needs to creatively mitigate systemic risks.

The paper below first provides some benchmarks against which to consider the design of regulation. Second, it attempts to provide an overview of what has been done to date to correct some of the initial causes of the crisis, much of which fall into the more traditional “micro” reasons for the crisis. It lastly delves into more detail about how to think of systemic risks and what types of “macro” regulation may be necessary to contain them. It attempts to identify those changes in policy and regulation that will be easier to implement and those that will be more difficult.

II. WHAT IS “GOOD” REGULATION?

Before considering response to the current crisis, it is useful to consider what types of regulations are desirable from a relatively abstract level and then use this set of desired outcomes to judge which regulatory responses are likely to be good ones.

1. *Minimize or eliminate “unintended consequences.”* Policymakers are often aiming to discourage bad behavior or encourage good behavior with regulation—aimed solely at a specific market or set of institutions or investors that has been identified as requiring corrective action. In today’s financial markets, however, it is difficult to surgically fix a specific problem without affecting other markets or participants that surround and interact with the problematic area. So interconnected and symbiotic are different types of markets—

say, over-the-counter and exchange traded—or financial institutions—say, banks and hedge funds—that avoiding unintended consequences is difficult, perhaps largely impossible.

That said, policymakers that enact “good” regulation are at least aware of how regulation in one area will affect other areas and attempt to either take into account these linkages or try to isolate the effects of regulation to the market or institution of interest. One way to take account of linkages is to broaden the regulation so that all relevant markets are covered to a similar degree. For instance, one could dictate that disclosure requirements for all financial institutions selling mortgages (regardless of whether they are chartered as banks, mortgage brokers, or some other entity) would be the same, providing the same information in the same format. Another method is to design the regulation in a way that accounts for the interactive effects on other markets or institutions, *ex ante*.

Uniform regulation also helps to limit regulatory arbitrage. In the present crisis, regulatory arbitrage took place at a number of levels. One way was, by housing structured credit products in off-balance sheet Structured Investment Vehicles (SIVs) and conduits, banks were permitted to hold less capital against those assets than in those held on balance sheet. Other examples of activities moving toward less regulated entities exist in nearly every country.

2. *Should provide incentives for individual institutions to contribute to “social good.”* This goal is particularly difficult to achieve in practice, since most regulation is applied at the level of institutions. Nonetheless, it is at the heart of regulation aimed to reduce or eliminate negative externalities. The key to designing regulation to achieve some social objective is to internalize the externality—impose on those causing the externality some cost or penalty that encourages them to change their behavior in such a way as to avoid producing the externality.

3. *Should be simple and easily understood by regulatees and regulators.* Though little to do with economic theory of regulation, most of those involved with implementing regulation recognize that rules are much easier to enforce if they are simple and easily understood by those being regulated. However, the complexity of the global financial system and the number of ways that regulation can be circumvented put the onus on policymakers to be sufficiently attentive to details so that the goals of the regulation are attained. This means, in practice, that more complex regulations are imposed even if they are more difficult to monitor and enforce.

4. *Should be least-cost method—use existing data or systems where possible.* The burden of regulation can be reduced if the regulation can use data or business practices already in existence in the regulated area. In many areas of regulation, including in the financial sector, the official sector is required to perform a cost/benefit analysis of the regulation. While a

simple tradeoff between costs and benefits is seldom easy to find, nearly all agree that the lowest cost regulation that achieves the goals should be chosen.

III. THE REGULATORY CONJUNCTURE

Since the beginning of the outbreak of the crisis in the summer of 2007, many new tools have been employed to stem the damage to the financial system and the real economy—these are mostly of the “temporary, crisis management” type. Looking further ahead, some new regulation has been put into place, but mostly policymakers are moving in a more deliberate fashion to examine what needs to be re-regulated and why. Unfortunately, markets are still not back to normal, and public pressure to “do something so this never happens again” is quite high, so regulations are likely to be put into place before a full examination of their consequences is understood and probably “over-regulation” will be the result.

Mostly, the re-regulation to date has been of the type that is relatively easy to do. Specifically, in the following areas some progress has been made.

Bank regulation. The Basel Committee is well on its way across a number of dimensions. Market risk revisions are set to be issued this summer with later adjustments expected on multipliers for Value-at-Risk (VaR) and stressed VaR. Risk coverage of Basel II will be strengthened in the areas of the trading book, off-balance sheet exposures, securitizations and external ratings, and counterparty credit risk. Liquidity risk guidelines have been revamped. Consideration of more rules-based liquidity risk regulations (e.g., quantitative benchmarks/standards) is underway, with several countries moving unilaterally to re-impose or strengthen such guidance. Strengthening of Pillar 2 in Basel II to include items such as firm-wide governance and risk management, compensation and incentive practices, management of securitization risks, off-balance sheet exposures and reputational risk. Even though Pillar 3 of Basel II has only been implemented in a few countries, better information will need to be presented about securitizations, sponsorships of off-balance sheet vehicles (and conduits), resecuritizations, valuations, and pipeline and warehousing risks.

Non-bank regulation. Discussion of better insurance company regulation continues following the AIG insurance company’s debacle. Discussion of eliminating the segmentation of insurance regulation by state in the United States has been raised, but not acted upon. Hedge funds, while not the focal point of the crisis, have received increased scrutiny and regulations that require more reporting and oversight are in the offing, particularly in Europe, but also in the United States. Private equity funds and venture capital funds may also be required to register with the U.S. Securities and Exchange Commission.

Credit Rating Agencies (CRAs). The European Commission and the Securities and Exchange Commission in the United States have prohibited CRAs from providing structuring advice on the products that they rate. They are required to share more information about the underlying

assets in any structured credit deal that they rate, and to disclose more about their rating methodologies. S&P, Inc, has also altered its practices to include an “s” on any structured credit product it rates as well as incorporating a rating volatility into rating determination. More is likely to occur, though the one that has caused the most soul-searching—the fact that issuers of securities pay for their own rating—is unlikely to change in the near future.

Accounting and Disclosure. Several initiatives to provide financial institutions with more leeway on how to value illiquid assets during a stressful period have been implemented to date (e.g., changes to FAS 157-4) . The Financial Accounting Standards Board is aiming to revamp off-balance sheet accounting rules so that more assets and liabilities will appear on the firm’s balance sheet. There are still other issues to be tackled in fair value accounting and further work on harmonizing U.S. GAAP with IFRS.

Governance and Compensation. Internal governance structures that downplayed the influence of risk managers and neglected to ensure top management understood the risks being undertaken by the firm are being changed—mostly voluntarily by the private sector. That said, for firms receiving government support, some strictures on management are being imposed. The realization that short-term, returns-based compensation schemes led individuals in firms to trade higher risk instruments (and to develop such instruments to sell at higher fees) has led to changes in compensation structures that reward longer-term, risk-adjusted returns. Some supervisors are using Pillar 2 of Basel II to oversee compensation as part of the risk management system in banks.

Central Counterparties (CCPs). Difficulties in settling credit default swaps (CDS) following the bankruptcy of Lehman Brothers, and the interconnectedness detected in AIG’s relations with other counterparties, has resulted in the formation of several CCPs, several of which are now operational, to net CDS contracts. Consideration of broader CCPs to house and net other Over-The-Counter (OTC) derivatives is getting more attention (e.g., see the proposal by the U.S. Treasury, May 13, 2009).

Market functioning. Short-term prohibitions of short-sales in equity markets have been implemented in a number of countries. Their rationale was predominantly to stem the sale of bank stocks, which came under intense selling pressure following revelations of large losses or speculation of such losses, if not revealed. Continued discussion on the public disclosure of short positions is underway. The United Kingdom has required it in some cases.

Overall, the types of regulation put into place so far represent fine-tuning existing regulations and adjustments to events that require fast action. The hard job of altering the more fundamental structure of regulation is still ahead. Many are considering how to proceed. For perhaps the first time in many years, a large number of academics have turned to seriously consider regulation. Two sets of academic papers have received extensive discussion in policy circles: “The Fundamentals of Financial Regulation,” the so-called “Geneva Report,”

and “Restoring Financial Stability: Policy Recommendations from NYU Stern,” the so-called “NYU Report.”³ Both papers cover many topics, by many authors, and attempt to elucidate for the covered topic the nature of the problem and the potential policy or regulatory response to do so. While some of the topics have a long history, e.g., short-selling and the role of the Fed, others are more forward looking about systemic risk, moral hazard, and cyclical risk taking. There are an assortment of papers that debate how to adjust bank capital requirements—either to make capital buffers larger, better adjust them countercyclically, or use contingent capital insurance.⁴

On liquidity management, there is a growing literature on how to measure, manage, and contain liquidity risk, including more recently systemic (funding) liquidity risk. That funding liquidity and market liquidity are interlinked and potentially explosive has influenced the thinking on regulation.⁵ Ideally, tackling both types of liquidity issues would be important, but in practice, most discussions have focused on one at a time: (i) funding liquidity with better risk management systems and central bank responses; and (ii) market liquidity with the encouragement of more exchange traded and transparent systems of price discovery.

IV. RE-THINKING “MICRO” REGULATION FOR SECURITIZATION MARKETS

The proximate cause of the crisis is a realization that the prices of structured credit products were unrealistically high. The mis-pricing of these relatively complex securities has multiple causes as the chain involved in the production and sale of these securities was long and convoluted. Without going into detail about all the actors in the originate-to-distribute model used in securitization and the incentives they faced, it is worth pointing out a couple of basic flaws.⁶

Originators’ incentives. At the beginning of the chain, originators of loans did not have an incentive to factor in the long-term consequences of potential borrower difficulties. Since the originators did not hold the underlying mortgage loans very long, their incentive was to find

³ See Markus Brunnermeier, Andrew Crockett, Charles Goodhart, Avinash D. Persaud and Hyun Shin, “The Fundamental Principles of Financial Regulation,” in Geneva Reports on the World Economy 11, Center for Economic Policy Research, London, UK and “Restoring Financial Stability: How to Repair the Failed System,” edited by Thomas F. Cooley and Ingo Walter, with Viral V. Acharya and Matthew Richardson, NYU Stern School of Business, New York.

⁴ See Anil Kashyap, Raghuram Rajan, and Jeremy Stein, “Rethinking Capital Regulation,” Working Paper, University of Chicago.

⁵ See Markus Brunnermeier and Lasse Pedersen, “Market Liquidity and Funding Liquidity,” *Review of Financial Studies*.

⁶ See Ashcraft, Adam and Til Schuermann, “Understanding the Securitization of Subprime Credit,” for more details regarding the multitude of players and their incentives.

a borrower, provide a mortgage, and on-sell the mortgage to another party who would pool a number of loans and construct securities from them. Little attention was paid to the suitability of the borrower. Indeed, often the borrower was not provided with the appropriate information for him to decide whether he would be able to pay the interest and principal in the medium-run. Because the incentive was to originate as many mortgages as possible to satisfy various quantitative targets desired by arrangers, credit standards were loosened to a degree unseen in recent times.

The most obvious solution is better oversight of loan originators and their dealings with borrowers—in essence, consumer protection-type regulation. Providing simple disclosures regarding ways in which mortgage payments may change based, say, on interest rate changes, establishing affordability criteria, and providing other suitability criteria would help. Simple and clear documentation would aid borrowers' understanding of their obligations—the current length of U.S. mortgage contracts and their complexity is likely to give any borrower a headache.

The compensation schemes for loan originators also need to change. During the run-up to the crisis, originators were paid on the basis of lending volumes, without attention to risk, leading inevitably toward too many originations. Compensation schemes that are longer-term, and risk-based, would provide incentives to be more careful about the borrowers' prospects.

The “skin in the game” or establishing requirements for an originator’s own exposure. The originate-to-distribute model of securitization has as one of its fundamental features that the originated loans are removed from the balance sheet of the financial institution. This frees up capital that can be used to support other business lines. At the same time, it provides little incentive for the institution to monitor the loans or to attempt to keep borrowers from becoming delinquent. A question about how much an institution should hold of the original loans if passed on for structuring is difficult to answer and even more difficult is what parts of the capital structure of a structured credit product (e.g., which tranches and how much) should be held by the arranger to provide the correct incentives for monitoring.⁷ Moreover, even if a formal purchase of various tranches were required, an institution could offload the risk of those tranches through the use of other hedging instruments. Accounting for hedges and tying them back to the original instrument has long been a difficult task for regulators or supervisors to verify. Moreover, financial institutions often hedge risks on aggregated positions, rather than using a piecemeal, instrument-by-instrument approach. Thus, providing regulations about how much “skin-in-the-game” is necessary to align incentives is likely to be difficult to design and monitor.

⁷ The European Parliament is expected to back rules that would force banks to hold 5 percent of the securitized products they originate. Other proponents have suggested 10 percent of each tranche of a CDO, and still others are looking to 20 percent.

Transparency of assumptions and models. Educating borrowers about loan terms and conditions should be extended to the end-users of investment products. In retrospect, many investors in structured credit products did not understand what they had purchased. In part, the information that would have allowed them to better understand the characteristics of the securities was not provided, or when it was, it turned out to be an overwhelming amount of detail. Both information about the underlying assumptions being used in a pricing model as well as the basic intuition underlying the pricing model should be released to potential buyers. Ideally, for actual investors in the structured credit products, the model used to assign values should be transparently conveyed.

As with many issues of transparency, revelation of too much information can be damaging to market functioning. By supplying the underlying assumptions and the pricing model, valuation techniques could be visible to other competitors, and the issuing firm could lose its competitive advantage. The potential impact of the release of proprietary information, however, is unclear, and at least the “plain vanilla” models should be publicly available.

Relationship between arrangers and credit rating agencies. The close relationship between arrangers of structured credit products and the credit rating agencies poses an interesting problem for policymakers. In the leadup to the crisis, anecdotal evidence suggested that arrangers of structured credit products attempted to obtain certain ratings for various structures (and tranches) by asking rating agencies what type of structuring would be needed to obtain the desired rating. This type of “gaming” led to structures that may not have rated on the basis of an objective, arms-length relationship, but blurred the line between rating and structuring the products. Rating agencies have since attempted to create more distance between the areas examining the structures and those responsible for rating the products. How policymakers can assure the such “Chinese walls” exist within a credit rating agency seems quite difficult. This problem is similar to the barrier that is meant to exist between a firm’s provision of retail investment advice and positioning in their proprietary trading arm in securities firms—regulation in this area has been difficult to enforce.

The fact that issues of securities pay for ratings, creating an incentive for the ratings agency to please their customer with a higher-than-deserved rating, is a relatively deep-seated issue that appears difficult to change. The rating agencies’ business model has always been to charge the issuer, not the investors. Debate in this area is ongoing. However, given that structured credit products have such different risk characteristics relative to corporate and sovereign ratings, a specially denoted rating should apply to structured credit products.

Appropriate consolidation and associated capital charges. Another area highlighted by the current crisis was the use of off-balance sheet vehicles of major financial institutions for holding and funding securitized products. These SIVs and conduits, were viewed as stand-alone, bankruptcy remote entities, having their own means of funding (often dominated by

wholesale, short-term, asset-backed commercial paper). By hiving off risk, originators could avoid consolidation on balance sheet, and thus, the associated risk-weights for the assets held there were low. In the event, when funding sources dried up and the now lower-valued assets were returned to the parent financial institutions (for reputational, rather than legal, reasons), the risk-weights associated with those same assets were much higher. Policies to correct these problems are relatively straightforward to implement—consolidation rules can be tightened up and risk-weights adjusted based on an assessment of whether a true risk transfer has occurred when assets are moved to off-balance sheet vehicles. Thus, for credit risk, certain fixes to Basel II and adjustments to risk-weights would help at the margin to better align risks with the associated capital charges.

V. MACRO (SYSTEMIC) REGULATION

“Micro”-oriented regulation has long been part of the oversight of the financial sector, but the notion of “macro-prudential” regulation is still a relative new concept and, frankly, not particularly well-defined. One way of thinking about macro-oriented regulation is that it is about regulation aimed at eliminating detrimental interactions of micro entities—e.g., households and firms—and thus has to do with aggregated outcomes, such as business or credit cycles, and especially, externalities. Thus, to date, there appear to be two strands of macro-prudential policies—one aimed at reducing the amplitude of cycles, especially the downside, through various countercyclical policies (both monetary and regulatory) and another set of policies that would mitigate against systemic risks. It is still accurate to view “micro”-regulation as helping to go part of the way to stem a build-up of systemic risks. Nonetheless, the current crisis has shown us that just regulating financial institutions and markets the “normal” way (even if the regulations were enforced properly) would not be enough to lessen the build-up in leverage and the interconnections across institutions that turned out to be so damaging to the financial system as a whole.⁸

A. Systemic Liquidity Risk

One of the main lessons from the current crisis has been that too many resources have been spent in recent years on examining the asset side of financial firms’ balance sheets and not enough attention had been spent on the liability side. The Basel Committee has spent a number of years refining Basel II to account for credit risk, but had last updated its guidance on liquidity risk in 2000. It was only just planning to re-examine the topic of liquidity risk in 2006 when the crisis hit.

⁸ I will not cover the strand of “macro” prudential policies aimed at reducing the damaging effects of cycles. The various aspects of procyclicality and potential policy responses are covered in IMF Staff Policy Note, “Policies to Mitigate Procyclicality” (SPN/09/09).

Latent systemic liquidity risks have been present for some time as the move toward short-term, wholesale funding structures in financial institutions has been a gradual, though steady, process. The use of short-term, wholesale funding was most egregiously employed in the SIVs and conduits supporting the structured credit products. Still, most firms understood that there was some risk that wholesale funding support could dry up quickly, but thought the risk was either adequately covered by contingency plans or by liquidity insurance with other financial intermediaries. Coverage was purchased and contingency plans were based on internal stress tests that factored in a failure to obtain funding, but did so assuming an adverse funding event could be no worse than that of the LTCM failure during which funding markets were frozen for about a week and the Fed gushed in liquidity to the financial system.

So how did systemic liquidity risk build up without anyone noticing? Although roll-over risks and funding difficulties occur with some regularity in emerging market countries, advanced economy financial institutions were viewed as having the best risk models and the best judgment about how to use them. Rollover risks had not materialized for many years and there was ample liquidity in the financial systems (in part due to relatively loose monetary policy). Such conditions desensitized firms from paying close attention to liquidity risks. In addition, before the crisis, many financial firms assumed that if liquidity problems became widespread, their domestic central bank would step in and provide the necessary funding to keep market functioning. And, indeed, this expectation was realized—though to a degree that no one could have imagined.

Systemic liquidity risk was underestimated and financial institutions were not provided any incentive to protect against it individually. Capital regulation for the purposes of offsetting balance sheet losses (mainly due to credit and market risk) has been the emphasis in recent years and liquidity regulation (such as a minimum liquid asset ratio or maximum asset/liability mismatches) had been gradually deemphasized. There are several ways to tackle liquidity risk management—a combination of “micro” regulation to assure individual institutions have adequate protection against a liquidity event as well as “macro” regulation to protect against their interactive effects on systemic liquidity. Ultimately, if the systemic event is too large, a central bank or banks will inevitably need to step in. However, the balance between the private sector and the public sector as regards the assumption of liquidity risks has been biased toward the public sector—some rebalancing of risks is now warranted.

Going back to some simple, traditional ways of regulating individual firm liquidity risk would be one way to at least assure financial institutions are not caught off-guard. While minimum liquid asset ratios have the disadvantage that the regulator or supervisor needs to specify some list of eligible assets, it appears this is not so difficult in most jurisdictions. Objectively, there is always some type of asset that is liquid most of the time and can be used easily if a funding problem arises. In most countries, short-term government paper is the

most liquid and has the advantage that it is also used by the central bank for open market operations. Defining a set of assets and a ratio seems relatively straight-forward.

Another way of regulating individual firm liquidity risk is to impose maximal asset/liability maturity mismatches. While actual maturities may not represent effective maturities, mismatches can be calculated using various models to approximate when cash flows are expected to become due and these techniques are fairly well understood. A regulation providing an upper bound on maturity mismatches (however calculated) would help eliminate the tails of the liquidity risk roll-over problems. Sufficient amounts of liquid assets, even if with a mismatched asset-liability gap, could go some way to alleviating this affect.

To cover the systemic component of liquidity risks, an additional charge of some type could be conceived to account for the fact that financial institutions that assume riskier funding practices are more likely to cause (and be the recipients) of a systemic liquidity event. In my view, such a charge would be best structured to be an ex-ante, insurance premium rather than an add-on to capital. A funding liquidity problem is not the same as a loss on the asset side of the balance sheet and thus a larger capital buffer will not “solve” a liquidity problem (though admittedly, larger capital buffers may help preclude a “run” on a bank’s deposits by making the bank appear healthier over all). Thus, a fee or charge for liquidity should be structured so that it provides an incentive for less-risky funding structures and the fee should be available to the institution in the case it runs into funding problems.⁹ The regular retail deposit insurance fund would be separate from this scheme, as it serves a different purpose—a retail deposit run—rather than a wholesale deposit run or systemic event. The riskiness of the funding structure would be determined by supervisors implementing the Basel guidelines on liquidity risk management, but could be as simple as a scale based on maturity mismatches and the robustness of contingent funding lines. The insurance premium or fee would thus go to an insurance fund, one at arms-length from the institutions and one capable of injecting liquidity when needed. Such an “insurance fund” would thus be funded ex-ante for potential liquidity problems and, if the adverse liquidity event became too large, the central bank would be expected to step in to stabilize the financial system. In principle, the insurance fund could be an arm of the central bank.

B. Systemic Insolvency Risk

Another issue has to do with systemic solvency issues—that is, when the insolvency of one financial institutions causes the insolvency of others. This type of systemic risk—a more traditional definition of domino effects of failures across institutions—will also need to be re-

⁹ A number of papers are expounding this idea. See Jean Charles Rochet and Xavier Vives, “Coordination Failures and the Lender of Last Resort: Was Bagehot Right After All?” CEPR Discussion Paper, 3233 and Enrico Perotti and Javier Suarez, “Liquidity Insurance for Systemic Crises,” CEPR Policy Insight No. 31.

examined. The issue is not just a too-big-to-fail problem, in that it is less to do with a removal of a major institution from the financial system with effects on credit intermediation to the real economy, but a too-connected-to-fail problems, where even smaller institutions with strong linkages to other institutions cause problems. Moreover, the problem may not be a literal failure or insolvency, causing others to fail, but given the interlocking payments of various types of assets or derivatives, just non-payment or “fails” on other types of transactions can gridlock the financial system. In some cases, just the uncertainty about whether one is going to receive payment may be enough to cause a halt in trading and payment flows. These kinds of interlinkages require more careful thought about how to mitigate them. If they are due to losses from a lack of payment, additional capital buffers would help. Thus, a capital add-on mirroring the degree to which a firm is “more connected” to others may provide an incentive to become “unconnected.” While the techniques for doing this are still in early stages, some progress has been made that ties interconnectedness to associated capital losses network modeling.¹⁰ This provides a way of “charging” for the externality imposed on the financial system arising from this avenue of systemic risk.

Systemic insolvency risk can also occur if multiple institutions are hit with the same shock causing a simultaneous risk of insolvency. The notion of a higher capital buffer to offset some of these types of event is again one way to assure bad outcomes are avoided. Another way would be to request that bank purchase insurance (ex ante) for the additional capital that is needed when a systemic event occurs.¹¹ This has the advantage that it does not drive up the cost of capital during the crisis (when other institutions also need capital). That said, who provides the insurance and how one guarantees their solvency during systemic crises are questions still to be addressed.

C. Measurement Issues in Regulation to Minimize Systemic Risk

Note that in choosing how to mitigate systemic risks, the regulatory tool should be matched to the goal of the regulation as closely as possible to assure it can address the cause of the systemic risk. While theoretically desirable to match causes of systemic risk with the modes of mitigating against them, this requires policymakers to be able to understand and, even more difficult, measure systemic risk.

Measurement techniques for systemic risk are still being developed. Policymakers may opt, at least initially, for some simple measures of systemic risk and the “systemically-important institutions” that are involved.

¹⁰ See IMF April 2009 Global Financial Stability Report, Chapter 2.

¹¹ See Kashyap, Rajan, and Stein (2008) for more details.

For systemic liquidity risk, one measure could be the riskiness of financial institutions' funding structures and their potential affect on others if they are unable to obtain (or supply) funding. These may include the proportion of liquid assets held on balance sheet, a measure (perhaps duration-weighted) of maturity mismatches between assets and liabilities, and a relative amount of contingent liquidity funding that would be available under duress. Other more complex methods could include the numbers of counterparties in various funding markets—with a more diversified funding base being desirable.

For interconnectedness and the knock-on effects of a financial institution's failure, various measures of the degree of distress dependence could be used. One could use the degree to which direct exposures in various markets allow an institution to be exposed to others' failures as a measure of actual vulnerability. A network model that measures such associations using actual exposure data could provide a rich environment to see how large a shock to that institution would be needed to cause failures across the system. The relative susceptibility of institutions to the hypothetical failure of a single institution could provide a measure of its importance to the system. Assuming the "shock" was to its credit-worthiness, a capital charge could be calibrated from such an exercise. If the "shock" was a liquidity shock, again some relative "cost" that the institution imposes on others could be calculated.

Alternatively, one could use market-based information, such as credit default swaps, to gauge the markets' interpretation of the interconnectedness of various financial institutions. The use of "CoVAR" measures or other joint probability of distress (JPoD) that examine the joint tail risk across institutions—in a multivariate setting initially and then a conditional probability of distress arising from a single institution's distress—could be used to calibrate a capital charge for systemic risks.¹² For instance, if the failure of institution A causes distress to increase for the other financial institutions in the system by a factor of say, 2, then this added risk should imply some greater amount of capital than is normally required should be held by institution A to assure it does not enter into distress. These new tools have not been tested yet, and they do not easily satisfy the "simplicity" criteria of good regulation suggested above, but this is one of the trade-offs that will face policymakers if they would like to mitigate systemic risk.

VI. REGULATING SYSTEMIC RISK THROUGH MARKETS

While measurement of systemic risk at the institutional level is an ongoing research agenda, policymakers can also consider way of reducing these risks within the context of the markets in which they materialize. For instance, counterparty risks and the associated uncertainties about the ability of counterparties to satisfy their contracts are one avenue for systemic risk

¹² See Tobias Adrian and Markus Brunnermeier, "CoVar" and the IMF's April 2009 Global Financial Stability Report, for alternative models for this concept.

to manifest itself. Making markets more durable to counterparty distress is an avenue also worth pursuing.

Counterparty risks can be mitigated by establishing central counterparties (CCPs) that interposes itself between the seller and the buyer of financial contracts, assuming the duties of each of the parties. The counterparty risk is absorbed by the CCP, which in turn can net (or novate) contracts to reduce gross exposures. This mechanism works to reduce counterparty-to-counterparty risk since multiple rounds of failures are avoided. However, the ability of the CCP to lower systemic risks is dependent on how well it is run—the members of the CCP need, themselves, to be financially sound and the risk management systems of the CCP need to be robust. Assurances that netting is legally supported (especially in cross-border contexts) and the CCP has enough capital to withstand failures of some of its clearing members also contribute to the reduction of systemic risks. Use of netting to mitigate counterparty risk is clearly greatest with the largest number of counterparties and thus, for a given market or set of similar contracts, one CCP is preferred.¹³

That said, it is important to recognize that the reduction in counterparty risks is one element of systemic risk, but operational risk, the risk that the CCP has difficulty fulfilling its tasks, perhaps due to a technological systems failure, or so-called “Act of God” is heightened by use of a single CCP. Nonetheless, operational risks appear more easily reduced through duplication of mechanical systems. Moreover, their failure can be more transparent than the speculation and uncertainty involved in individual financial institution distress and thus cause less panic when it is understood that a mechanical failure has occurred.

Systemic risk caused by highly volatile markets with abrupt price movements can be tackled by making the markets themselves more robust. For instance, financial markets can also be made more stable by attempting to assure they are transparent and liquid—the elements that assure that the criteria for “perfect markets” exist. Thus, mechanisms that allow traded price and quantity information to be conveyed transparently to potential buyers and sellers can make markets more stable, all else equal. Financial instruments with standardized terms and conditions tend to acquire more liquidity, allowing price changes and bid/offer rates to be less volatile. Margining procedures between counterparties to trades (and within the context of a CCP) lower the need to make large payouts at the maturity of contracts, tending to lessen the probability of default. Thus, the type of systemic risk that appears related to “excessive” volatility and uncertainty about the functioning of markets can be addressed by regulations that encourage the development of CCPs, increased *ex post* price and quantity transparency, standardization of contracts, and margining systems. Certainly, the motto “build it and they

¹³ See Darrell Duffie and Haoxiang Zhu, 2009, “When Does a Central Clearing Counterparty Reduce Counterparty Risk?” Working Paper (Palo Alto, CA, Stanford University).

will come...” cannot be satisfied in real-world market situations, though if it is built well it will be more likely to be used.

VII. REGULATING SYSTEMIC RISK THROUGH INSTRUMENTS

Some have questioned whether the regulatory system has allowed “systemically-important instruments” to exist and whether the instruments, themselves, should be subject to regulation or even banned. Most discussions in this area are centered on the destabilizing role that credit derivatives played, including credit default swaps and structured credit products such as collateralized debt obligations. It is important to recognize that the development of instruments is the focal point of financial innovation—it is in the design of instruments that risks and returns are structured to attract various types of holders, ideally holders that can accept the risks and returns being offered. Taking into account the ultimate goal of having a financial system that efficiently and equitably distributes savings to investors, it is unclear to me that trying to determine systemically important instruments and then regulating them is a useful exercise. There is no “systemic” nature of an instrument, per se, but systemic issues arise due to the actions surrounding where and how it is traded and by whom. It is the interaction of market participants that amplify prices or have the potential to cause systemic failures.

Still the argument for regulating instruments is not specious. The history of regulating products or financial instruments stems from the perspective of consumer protection. Those who do not fully understand the product may assume more risk than they should and may not be able to hold the instrument and pay its obligations. There has also been a history of discouraging “speculation,” by banning “speculative instruments.” Though misplaced, one way to keep people from purchasing or trading instruments they do not understand is to assure that prospectuses are accurate and easy to read. Another way, only recently discarded, is to have criteria for instruments that trade in public venues, such as futures or stock exchanges. Such criteria may (and did) include a discussion of the economic purpose of the instrument to be traded. Thus, the hedging aspects of the instrument may be interpreted as adding an economic reason for its existence. Perhaps, if there is little economic rationale for an instrument it should not be offered in the context of an organized financial market. This bar is fairly low for new instrument design and organized exchanges typically expect some reasonable amount of volume before they are willing to offer new instruments even if they have an economic purpose. A benchmark that asks for economic justification would be unlikely to stifle *bona fide* financial instruments that satisfy the criteria of spreading risks to those most able to bear them.

VIII. CONCLUSION

This paper is meant to review some of the traditional ways of thinking about regulation, and place that review in the context of the current crisis alongside some of the policy responses under discussion.

Many responses to the crisis suggest a large role for regulation and supervision in controlling the financial system. While there was clearly a lack of enforcement of regulatory and supervisory guidance in the crisis, this does not mean that more regulation and supervision is necessarily best.

This paper advocates improving risk-based regulation by “repainting the center line” but also augmenting the road with “guardrails.” It argues for the following 8-point plan:

1. Policymakers take an inventory of which “market failures” caused problems and why—preferably in an environment that ignores public outcry.
2. Examine whether there are regulatory or supervisory actions that can address the root of the “market failure” without causing other effects—so-called unintended consequences. Put simply, examine whether regulation can actually improve the situation rather than make it worse.
3. If it looks like regulation can improve the situation it should be designed, if possible, to provide incentives for the private sector to solve the “market failure” itself, allowing risks to guide the decisions of firms, but augmented by policies to assure risks are appropriately priced and markets function as unimpeded as possible. If it is not possible to create the right incentives, more heavy-handed regulation (e.g., quantity restrictions on exposures) may be needed.
4. The regulatory system should aim to make the line down the middle the focal point for a smooth functioning financial system—that is, design regulation so that most financial institutions have an incentive to remain close to the center line.
5. However, given the scale of the disruption witnessed in this crisis, some “guard rails” need to be put into place, mostly where there are drop-offs on the side of the road—where systemic events are likely to occur. These “guard rail” regulations would be hard-wired into the regulatory frameworks. They would be far enough from the center line (the mainstream, risk-based regulations) that they would only be binding infrequently. These types of regulation would be items like:
 - A maximum leverage ratio for banking institutions.
 - A minimum liquid-asset ratio for any institution wanting to tap emergency liquidity.
 - Bans on instruments offered to investors that serve no justifiable economic purpose.

- Strictly enforced suitability criteria applied not only to retail, but also wholesale, investors.

The fact that some banks failed to understand the risks embedded in some of the structured credit products they purchased suggests even so called “sophisticated” investors may need some consumer protection. This is new—it has long been assumed that financial institutions should know better than to take on risks they do not understand, but the incentives (short-term, return-based) are such that this cannot be guaranteed unless the incentives are changed.

6. Systemic risk will become more problematic over time as markets are able to move faster with new technology and as the world, due to more globalized financial markets, becomes more interlinked. Thus, mitigation of systemic risk through “micro” and “macro-prudential” regulation is needed. Some ideas about how to do so, including matching, as closely as possible, the regulatory tool with the cause of the systemic risk are provided above. The specifics are important and the regulation will need to transparently connect to the problem it is meant to solve. Capital regulation should be used for systemic risks affecting losses and liquidity regulation should be used for systemic risks affecting liquidity.

7. The more global nature of systemic risks means that regulatory structures need to assure systemic risk is not just passed to other jurisdictions, and thus consistency of treatment and communication and information flows across countries are needed. This could be most efficiently achieved if countries appointed a “systemic risk regulator” to maintain contact with his counterparts in other jurisdictions.

8. In all the above, a constant review of what is considered “good” regulation should be in the backdrop, with an attempt to satisfy the best practices of regulation as closely as possible.

It is probably worth emphasizing that this paper mostly examines policies that aim at the *prevention* of financial instability—preferring this approach rather than dealing with the *aftermath*. There is another school of thought that suggests that instead of spending effort on prevention, it is less costly in the long-run to use scarce resources for the “clean-up” since prevention almost surely lowers economic growth and efficient risk transfers. These policies would focus on reducing insolvency costs through better bankruptcy codes, enhancing crisis management skills and emergency liquidity support facilities, and providing clearer burden sharing guidelines. Improvement along these dimensions also needs to take place—that is, both pre- and post-crisis regulatory reforms are needed. Nonetheless, it is my view that relatively more should be spent on prevention than cleanup.

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