

Managing Systemic Risks

Charles Taylor

Summary

This paper begins with a working definition of systemic risk as “a systemic risk is a risk that an event will trigger a loss of confidence in a substantial portion of the financial system that is serious enough to have adverse consequences for the real economy.” It focuses on an operational definition of systemic risk management as a combination of six specific things that governments can do:

- *Resilience and robustness*: reduce the chances of a mishap by making the system more resilient and robust;
- *Monitoring*: put in place an early warning mechanism to detect when exposure to systemic risk is increasing;
- *Response*: develop a set of policy instruments to help nudge the financial system back on course when risks are rising;
- *SSI oversight*: regulate and supervise the safety and soundness of systemically significant institutions (SSIs) – that is, those institutions and markets whose failure would threaten the stability of the system as a whole;
- *Failing institutions*: manage the failures of SSIs in an undisruptive way; and
- *Crisis management*: contain any systemic collapse of confidence, institutions or activity and shepherd the system back to health.

The paper explores what exactly each of these possible elements of systemic risk management might involve.

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Introduction

The first paper that we published in this series dealt with the subject of systemic risk.² There, Darryll Hendricks defined and discussed what systemic risk is, giving some examples, looking at the notion of systemically significant institutions and reviewing alternative ways of analyzing systemic risk problems. This briefing paper goes a step further. It looks at what is meant by systemic risk management. Like Hendricks' paper, it does not advocate a particular approach but tries to define and illustrate the concept.

To recall the working definition of systemic risk from Hendricks' paper, "a systemic risk is a risk that an event will trigger a loss of confidence in a substantial portion of the financial system that is serious enough to have adverse consequences for the real economy." So, at a very general level, we can simply extend this and define systemic risk management as:

The management of the risk that an event will trigger a loss of confidence in a substantial portion of the financial system that is serious enough to have adverse consequences for the real economy.

Alternatively, we can define systemic risk management operationally, as a combination of six specific things that governments can do.

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² See Pew Financial Reform Project Briefing Paper #1, "Defining Systemic Risk" by Darryll Hendricks, http://www.pewfr.org/task_force_reports_detail?id=0012

- *Resilience and robustness*: reduce the chances of a mishap by making the system more resilient and robust;
- *Monitoring*: put in place an early warning mechanism to detect when exposure to systemic risk is increasing;
- *Response*: develop a set of policy instruments to help nudge the financial system back on course when risks are rising;
- *SSI oversight*: regulate and supervise the safety and soundness of systemically significant institutions (SSIs) – that is, those institutions and markets whose failure would threaten the stability of the system as a whole;
- *Failing institutions*: manage the failures of SSIs in an undistruptive way; and
- *Crisis management*: contain any systemic collapse of confidence, institutions or activity and shepherd the system back to health.

The six elements of systemic risk management:

- Making the system resilient and robust
- Monitoring the state of the system
- Responding to any deterioration in its state
- Overseeing systemically significant institutions (SSIs) and markets
- Managing failures of any SSIs
- Managing crises

Systemic risk management is like other forms of risk management in at least two ways. First, it comprises a combination of preventive and reactive measures. Resilience and robustness, monitoring and SSI oversight are preventive; and responding, managing failures and crisis management are reactive. Second, it can never guarantee absolutely the safety of the system. It might seem an obvious point, but it is surprising how many skeptics about systemic risk management raise this as an objection. There will always be some uncertainty about the efficacy of preventive measures, the accuracy of indicators used in monitoring and so on, just as brakes on a car do not always prevent accidents. There will be trade-offs between efficacy and costs including, potentially, costs of increasing the moral hazard in the system and reducing its efficiency. But, as in the case of car brakes, preventing just one accident can make them

worthwhile, since in the case of failures in the financial system the costs of systemic crises are usually very high in dollar and in human terms, however they are measured.

The risk created by monetary policy is one risk that is clearly systemic and yet is not universally thought of as falling into the purview of systemic risk management. As we know from recent events, it is possible for low interest rates and rapid monetary expansion to fuel an asset bubble and create stresses on the financial system; monetary policy can be a potent source of systemic risk. And some would argue that there are times when trade-offs can be made between overall price level stability and growth on the one hand and asset price stability and systemic stability on the other.

But it can also be argued that the task of monetary policy is to maintain overall price stability, or to achieve the best possible trade-offs between price stability and growth, and then the task of systemic risk management is to manage the risks to the system, with the course of monetary policy and, for that matter, fiscal policy as givens.³ And where a systemic risk management policy might have an effect on monetary aggregates or rates, then it will almost always be possible to sterilize these effects. In other words, monetary policy and systemic risk management policy can be viewed as arguably separable. One might say that systemic risk management is like maintaining the controls of a car, and monetary policy is like driving it. The two activities are interdependent, but most of the time they can be managed separately.⁴

Alternative terms for systemic risk management are “macro-prudential regulation” and “systemic stability management.” There are some differences in nuance – so for example crisis management would not normally be included in systemic stability management, because by the time there is a crisis, systemic stability is no longer the problem. But, broadly speaking, these three terms are used interchangeably in public debate and in the literature.

³ The disparity in current tax rates on debt and equity and the established tax relief afforded to home owners for their mortgages were both touched on in Pew Task Force discussions. Both contribute materially to financial fragility. In other words, fiscal policy, like monetary policy, can be an important source of systemic risk.

⁴ This idea that the financial system has to work well in a variety of fiscal and monetary environments is behind the recent criticism of Richard Fischer and Harvey Rosenblum against the performance of the “Too Big To Fail” banks for the past several quarters: “The Blob That Ate Monetary Policy” WSJ, 9/28/09.

The remaining sections of this note expand on the six elements of systemic risk management, starting with resilience and robustness.

Resilience and robustness

The basic idea of resilience and robustness of the financial system is simple enough. In normal times, policies should encourage the development of system features that would make it less prone to failure and quicker to self-heal when it did. Candidates for this would include adjustments to minimum capital or loss reserving standards that worked against the credit cycle or higher capital requirements for institutions that were more systemically significant. A policy that required institutions to maintain plans for their own financial failure and thereby increased the speed and certainty about wind ups might be an example of a policy that would contribute to the system healing itself in times of crisis.

In many sciences, a great deal of effort has gone into the study of evolving populations, networks and complex systems. This work suggests other ways of strengthening the financial system. For example, promising strategies might include putting in firewalls that might prevent or at least delay the transmission of contagion, increasing diversity in populations of institutions, making sure that population turnover occurs and is not too disruptive, and evolving the system away from having critical nodes.^{5 6}

These sciences also suggest what sort of data might be needed to make good policy judgments in pursuing strategies like these. So, for example, it would be useful to know more about the network of relationships between institutions (and even individuals). Today, something is known about the network of payments, but very little is known about the networks of transactions, exposures or information

⁵ These last two points are, again, considerations in setting policy for “Too Big To Fail” institutions.

⁶ See for example “New Directions for Understanding Systemic Risk: A Report on a Conference Cosponsored by the Federal Reserve Bank of New York and the National Academy of Sciences”, published by the National Academy of Sciences in 2007.

flows. It would also be valuable to know whether the diversity of portfolios, business strategies and legal structures amongst firms was changing and how, which today's regulators do not track systematically.⁷

Practical steps to increase system resilience might include:

- Strengthening individual institutions by such measures as requiring higher capital, particularly total common equity for all financial institutions, improvements in risk management and alignment of incentives to the institution's risk appetite;
- Improving market efficiency through the issuance of subordinated-debt;⁸
- Improving resilience of institutions through the issuance of convertible debt;⁹
- Strengthening the financial network structure by reducing the size and number of systemically significant institutions over time, by raising capital requirements sufficiently, by discouraging concentration of activity in critical markets and systems where possible, and mandating redundancy and resilience where not;¹⁰
- Reducing the vulnerability of one institution to another by encouraging wider use of central counterparties for clearance and settlement; and
- Putting more "grit in the system." Current examples include circuit breakers that prevent large downward market moves in a single day and short-selling rules that restrict the shorting of stocks in certain situations.

⁷ See for example "Rethinking the Financial Network" by Andrew G. Haldane, Executive Director for Financial Stability at the Bank of England; a speech delivered at the Financial Student Association, Amsterdam in April 2009. <http://www.bankofengland.co.uk/publications/speeches/2009/speech386.pdf>

⁸ See, for example, "Subordinated debt as bank capital: A proposal for regulatory reform," Douglas D. Evanoff and Larry D. Wall, *Economic Perspectives*, Vol. 24. <http://www.chicagofed.org/publications/economicperspectives/2000/2qep3.pdf>

⁹ See, for example, "An Expedited Resolution Mechanism for Distressed Financial Firms: Regulatory Hybrid Securities," The Squam Lake Working Group On Financial Regulation, April 2009. http://www.cfr.org/publication/19002/expedited_resolution_mechanism_for_distressed_financial_firms.html#

¹⁰ The clearing and settlement of government bonds, the insurance of municipal bonds, credit ratings and the clearance and settlement of stocks are all examples of markets or activities where there is extreme operational concentration of systemic risk.

Monitoring the system

That brings us to the second element of systemic risk management, which is monitoring the system for early signs of increased exposure to systemic risks. There is a choice to be made here between whether to monitor a small, or a large number of institutions and whether to monitor a small or a large number of indicators:

1. *Focus on a small number of institutions and a small number of indicators:* for example, understanding the changing characteristics of the network of credit and other relationships between the most systemically important institutions would provide useful insights about emerging systemic risks.
2. *Focus on a small number of institutions and a large number of indicators:* this variant might, for example, include extensive and intense regulatory monitoring of risk indicators for individual SSIs and looking for emergent common patterns of potentially dangerous behavior. Underlying both (1) and (2) is the view that, if the core of the system is sound then the whole system is protected.
3. *Focus on a large number of institutions and a small number of indicators:* for example, it might be enough to look for rapid increases in asset prices (in relation to other prices, such as rental rates or income in the case of house prices) and credit expansion, and to look for periods and places in the economy where they are both present. Many systemic crises have happened when an asset price bubble, fueled by excessive credit expansion, has burst. Witness of course the US housing bubble in the years preceding the 2008 crisis.¹¹
4. *Focus on a large number of institutions and a large number of indicators:* under this strategy, in addition to looking for signs of bubbles, the authorities would look for signs of imbalances and vulnerabilities, declines in standards, increases in opacity and complexity, increases in speed, and changes in various populations and networks that make up the financial system. Such a wide-ranging strategy would reflect the lessons of other areas of risk management that suggest that major mishaps are often preceded by many small things going wrong. Or, to put it another

¹¹ See for example "The Subprime Solution: How Today's Global Financial Crisis Happened, and What to Do about It" by Robert J. Shiller, 2008, Princeton University Press This suggestion has also been discussed at Pew Task Force meetings.

way, many signals indicating yellow for different aspects of the system may sometimes signal a red alert for the system as a whole.¹²

There are pros and cons to each strategy. (1), (2) and (3) use data that are readily available and a serious ongoing effort would probably not increase costs of regulation or compliance that much.¹³ In addition, (1) and (2) could be carried out by any agency that oversaw systemically significant institutions by itself. However, in favor of strategies (3) or (4) is that either would reach to the edges of the financial system – to the indicators of housing price increases and mortgage broker behavior, which were early indicators of trouble in this recent crisis. Many past crises started at the periphery of the system. And, while strategy (4) is likely to be the most expensive – new metrics would need to be devised and information on them collected – it would also be the most comprehensive and innovative, and perhaps be most likely to detect signs of the “next war,” so to speak, rather than simply preparing the systemic stability regulator to fight the last war.

Finally, it would be possible to adopt a hybrid strategy of applying any one of (1) - (3) as an intermediate step on the path toward full implementation of strategy (4).

Whichever approach was adopted, the task of systemic risk monitoring requires the identification, measurement and monitoring of indicators and the setting of thresholds that define different levels of system exposure to risk. At some point, observation must be followed by decision and action.

There will no doubt be many Type I and II errors to start with, and so in the early years at least monitoring will also involve the progressive refinement over time of the choice and measurement of indicators and the definition and interpretation of thresholds.

¹² See appendix for additional insights into what sorts of indicators might be included in strategy (4).

¹³ To do (2) well – to collect comprehensive timely data on large institutions would require a major investment. However, this needs doing for micro-prudential reasons too and the incremental costs attributable to systemic risk management data requirements should be limited.

Responding

The point of monitoring the system is to respond in some way when indications of exposure increase sufficiently -- to encourage, incent or compel private actors in the system to change their behavior toward collective moderation.

The most mild policy response would be to publish the evidence. In some circumstances, this may be enough to change private sector behavior and avert a crisis. In others, the behavior that led to the rise in risk may persist if there is no mechanism to coordinate private sector responses. Where publication fails, jawboning the markets and the institutions may work, particularly if there is some threat of credible and proportionate active policy response to back it up. Active responses are sometimes suggestively characterized as “leaning against the wind” or “shepherding the system” rather than allowing it to evolve unchecked in ways that might become chronically unstable. In recent years, one of the more discussed ways of doing this has been to make adjustments in leverage and capital requirements aimed at accelerating or retarding specific kinds of economic activity. These adjustments could take the form, for example, of changing premia on maximum loan-to-value ratios or minimum micro-prudential capital standards, reserving requirements, margin requirements and retention requirements (skin in the game). They could be applied to the economy at large, or to regions, industries, institutions or processes (like the origination-to-distribute process) -- wherever there was sufficient evidence of increases in systemic risk.

Other ways of responding actively to signs of systemic risk include changing standards and powers. So for example a systemic risk regulator could respond to the rapid spread of a new financial product that it deemed particularly risky by raising the standards for new product review procedures within financial institutions. Similarly, it might require strengthening of underwriting or securitization processes above minimum micro-prudential or conduct-of-business standards, if it appeared that actual practice (as opposed to minimum practice) was declining.

Most active policy responses could in principle be rule-based and automatic. This would insulate systemic risk regulators from political pressures, which are likely to be especially severe where they are retarding economic activity: pricking bubbles or “taking away the punchbowl” is difficult to do without

earning the ire of politicians. Alternatively, they could be discretionary. This would have the advantage of allowing the authorities to recalibrate their policies over time in the face of innovation and other secular systemic changes.

Systemically significant institutions (SSIs)

Several factors contribute to systemic significance. These include leverage, complexity, maturity transformation, interconnectedness, activities, market position and size. The oft-used expression “Too Big To Fail” (TBTF) is misleading because it makes it seem as though it is only size that matters: it does – particularly when it is associated with a high market share in an important activity or market – but it is not the only thing. Moreover, TBTF is often used as an “either/or” proposition, implying that an institution is, or it is not, systemically significant. In reality, it may well be hard to draw any line as the structure of the financial system changes over time or as a crisis unfolds.

Still, some institutions are more likely than average to cause a crisis or hasten the spread of one if they fail in a disorderly way. All other things being equal, the system is stronger when the likelihood of disorderly failure amongst such SSIs is reduced.

Particularly thorough and demanding safety and soundness (or micro-prudential) regulation of these institutions can contribute to systemic stability if it reduces the chance of such failures. That translates into tougher standards that are better enforced: higher capital requirements; more rigorous risk management; stronger alignment between compensation and long term performance; and restrictions on particularly risky activities.

Such regulation and supervision will be challenging. These institutions are by definition larger and more complex than average. Exceptionally capable and courageous teams of examiners are needed to face off against managements that can be formidable.

Managing failures

When SSIs fail, as they will from time to time, they need to be wound up or nursed back to health in as orderly a way as possible. The aim is to minimize contagion – the dangers of locking markets, counterparty failures, panic and collapse.

There are two principal ways this can be done: through bankruptcy and through government-assisted resolution. These have both been described and analyzed in some detail in other papers in this series.¹⁴

The central difference between the two methods is that bankruptcy puts the process in the hands of a judge whose discretion is relatively limited, whereas resolution puts the process in the hands of the government and gives it a great deal more discretion over when and how to intervene and what support to provide. Moral hazard in normal times is arguably likely to be less under bankruptcy; that is, creditors and other stakeholders of institutions that might be systemically significant in the next crisis are less likely to expect a bail-out if things go wrong and, therefore, to apply their usual standards of due diligence and thereby subject such institutions to proper market discipline. On the other hand, resolution during a crisis arguably gives flexibility to the systemic risk regulators to modulate their interventions to the particular circumstances, and to evolve their methods over time.

Managing crises

Recognizing the onset of a full-blown crisis is not likely to be easy, even if there are great improvements in monitoring systemic risk. Candidate indicators would be a sudden contraction in liquidity or collapse of prices in one or two major markets, associated with the sudden threat to the liquidity of one or more SSIs. But how sudden and how large do the changes have to be to induce panic and contagion? And which institutions are really systemic? As in the case of monitoring, systemic risk managers are inevitably going to make Type I and Type II errors from time to time in determining when a crisis has begun.

¹⁴ See Pew Financial Reform Project Briefing Paper #4, “The Argument Against a Government Resolution Authority” by Peter J. Wallison; and “The Case for an Orderly Resolution Regime for Systemically Important Nonbanks” by Rodgin Cohen and Morris Goldstein, in draft.

The range of tools conceivable for crisis management are very much the ones we have seen in use during the current crisis -- plus, of course, the ability to resolve systemically significant non-banks in an orderly way. These include the provision of liquidity to particular markets and institutions, the public purchase of distressed assets and the recapitalization or nationalization of institutions that are in trouble. Is it possible to bolster and then restore confidence without spreading moral hazard? That depends on how clear it is that bail-outs are reserved for truly abnormal times.

Conclusion

All six elements of systemic risk management -- making the system resilient and robust, monitoring the state of the system, responding to any deterioration in its state, overseeing systemically significant institutions (SSIs) and markets, managing failures of any SSIs and managing crises -- present difficult challenges for legislators and regulators. The starting point is to understand what each element entails. Any approach to systemic risk management that has a chance of reducing the exposure of our financial system to systemic crises will be built on such an understanding and will reflect conscious choices about how each of these six elements is designed and implemented.

Appendix

Indicators for Comprehensive Systemic Risk Monitoring

Focusing on a large number of institutions and a large number of indicators was the fourth strategy described in the main text. Under this strategy, in addition to looking for signs of bubbles, the authorities would look for signs of imbalances and vulnerabilities, declines in standards, increases in opacity and complexity, increases in speed, and changes in various populations and networks that make up the financial system:

- *Emerging imbalances and vulnerabilities:* rising leverage and maturity mismatches – declines in capital, margins, “skin in the game” and collateral practices; increasingly common or extreme misalignment of compensation and risk management; growth in below-market funding and increasing liquidity risks including the growth of instruments perceived to possess deposit-like liquidity characteristics, such as asset backed commercial paper and repos;
- *Declining standards:* increasing incidence and severity of mismanagement, conflicts of interest, misselling and fraud and declining standards of disclosure and transparency (including valuation model transparency), risk management and due diligence in lending, trading and securitization;
- *Increasing opacity and complexity:* increasing complexity and obscurity of legal structures, deteriorating documentation, poorly controlled expansion, and accelerated increases in the number of intermediaries and in the complexity and size of individual institutions;
- *Increasing speed:* Reduced processing times, such as those for mortgages and securitizations in recent years, and increases in the speed with which new products are brought to market; and
- *Changing populations:* changes in the populations of customers, such as the explosive growth of financial services customers as a result of broadening financial qualifications in the build-up to the current crisis, or the expansion in the variety of available mortgage products.