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By James B. Thomson

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One of the most important issues in the regulatory reform debate is that of systemically important financial institutions. This paper proposes a framework for identifying and supervising such institutions; the framework is designed to remove the advantages they derive from becoming systemically important and to give them more time-consistent incentives. It defines criteria for classifying firms as systemically important: size (the classic doctrine of too big to let fail) and the four C's of systemic importance (contagion, concentration, correlation, and conditions); it also discusses the concept of progressive systemic mitigation.

James B. Thomson is a vice president in the Office of Policy Analysis of the Federal Reserve Bank of Cleveland. The author thanks the regulatory reform workgroup at the Federal Reserve Bank of Cleveland (Jean Burson, Emre Ergungor, Mark Greenlee, Joe Haubrich, Paul Kaboth, Dan Littman, Stephen Ong, and Andy Watts) for their thoughtful contributions to this work, as well as Ed Kane, Bill Osterberg, Mark Sniderman, and Walker Todd for their insightful comments and suggestions.

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Introduction

Central banks increasingly define financial stability as a key mission, second only to monetary policy. Achieving financial stability involves promoting time-consistent incentives for financial firms and other market participants. Getting the incentives right requires supervisors to deal with systemic risk and, in particular, systemically important financial institutions. Establishing a financial stability supervisor alone will not achieve stability; it is also crucial to deal proactively with systemically important financial institutions. To do so, it is necessary to have a workable definition of “systemically important.”

On one level, the definition is fairly simple. A firm is considered systemically important if its failure would have economically significant spillover effects which, if left unchecked, could destabilize the financial system and have a negative impact on the real economy. This definition is unsatisfactory because it provides little guidance in practice. What we need is a workable definition of “systemically important.” However, because a variety of factors could make a firm systemically important, a one-size-fits-all definition would not be very useful.

What can be gained from putting parameters around the term? Delineating the factors that might make a financial institution systemically important is the first step towards managing the risk arising from it. Understanding why a firm might be systemically important is necessary to establish measures that reduce the number of such firms and to develop procedures for resolving the insolvency of systemically important firms at the lowest total cost (including the long-run cost) to the economy.

This paper aims to establish a set of criteria for designating financial firms as systemically important. First, the sources of systemic risk are identified by considering how a financial institution becomes systemically important. Regarding systemic importance as a continuum rather than a binary distinction, we then investigate the usefulness of establishing categories of systemic importance and the trade-off between a manageable definition and the number of categories used to classify financial institutions. Next we discuss the establishment of a list of systemically important financial institutions, weigh the merits of making such a list public, and offer criteria for categorizing institutions. We close with conclusions and policy recommendations.

Defining Systemically Important Financial Institutions

The purpose of creating a practical definition of systemic importance is to enable supervisors to discipline systemically important financial institutions. Understanding the nature and causes of systemic importance is the foundation for creating regulations, supervisory policies, and infrastructure that will rein in the associated systemic risk; in some cases, doing so sufficiently mitigates an institution’s potential systemic impact so that it would no longer be considered systemically important. Because any two firms could be deemed systemically important for unrelated reasons, a one-size-fits-all designation such as “too big to fail” is inadequate.¹ Consequently, the approach taken here is to propose a means of classifying systemically important financial institutions (SIFIs).

1. The first incarnation of the philosophy of “too big to let fail,” dates back to the FDIC bailout of the Continental Illinois Bank and Trust Company of Chicago in 1984. For a discussion of the failure and rescue of Continental Illinois, see Irwin Sprague, 1986, *Bailout: An Insider’s Account of Bank Failures and Rescues*, N.Y.: Basic Books.

Size

The simplest—and potentially most flawed—way to classify SIFIs is a size threshold, whether it be asset-based, activity-based, or both. Ideally, a size-based classification should have a flow of funds/credit intermediation aspect. For instance, a bank with 5 percent of assets nationwide that holds a portfolio made up largely of government and agency securities is likely to have less serious systemic implications than a comparable bank with a portfolio of commercial and industrial loans. After all, the bank holding mostly low-risk, marketable securities will be less likely to fail—and will suffer fewer losses if it does fail—than the bank holding more opaque, riskier commercial and industrial loans. Off-balance-sheet activities might also need to be accounted for. Credit substitutes, such as letters of credit and lines of credit, are rightfully included in financial firms' credit-intermediation activities. Moreover, it is important to define SIFIs in a way that minimizes unintended consequences, such as reducing market discipline on firms added to the SIFI list.

Size alone is not an adequate criterion. Although the size threshold could certainly be set low enough to capture most of the firms that are systemically important for other reasons, the majority would not be systemically important. Including these firms would put too heavy a burden on them: One objective of defining systemically important institutions is to allow differential regulatory taxes across types. Efficiency and equity concerns therefore require more flexible definitions. The definitions presented here will be based on four factors other than size which, individually or collectively, can make a financial institution systemically important. These are the four C's of systemic importance: contagion, correlation, concentration, and conditions (context).

As a starting point for a size-based definition, a financial firm would be considered systemically important if it accounts for at least 10 percent of the activities or assets of a principal financial sector or financial market or 5 percent of total financial market activities or assets.² Using current financial-sector designations as a guide, a SIFI would satisfy any of the following criteria.³

- The consolidated entity holds 10 percent or more of nationwide banking assets
 - Or has 5 percent of nationwide banking assets and 15 percent or more of loans.
- After converting off-balance-sheet activities into balance-sheet equivalents, the consolidated entity holds 10 percent or more of nationwide banking assets.
 - Off-balance-sheet items would include, for instance, items from schedule RC-L from the FFIEC Reports of Income and Condition and HC-L from the Federal Reserve Y9 reports; structured investment vehicles and other loan special purpose entities used to remove assets from the firm's balance sheet for regulatory capital purposes; and assets sold or securitized.
 - It might be prudent to apply the adjusted-asset test only to financial institutions that hold more than 5 percent of U.S. banking assets.
- The consolidated entity accounts for 10 percent of the total number or total value of life insurance products (whole and universal life policies and annuities) nationwide.
- The consolidated entity accounts for 15 percent of the total number or total value of all

2. These standards could be established on a book or fair-market basis. Ideally, SIFI thresholds would be determined using fair-value accounting when possible.

3. These are examples of possible thresholds. However, any proposed system of thresholds must be vetted and, if possible, established (and periodically updated) on the basis of empirical studies.

insurance products (whole and universal life policies, property and casualty policies, annuities, etc.) nationwide.

- A nonbank financial institution (other than a traditional insurance company) such as an investment bank might be considered systemically important if
 - Its total asset holdings would rank it as one of the 10 largest banks in the country
 - Its total assets would rank it in the top 20 largest banks and its adjusted total assets (accounting for off-balance sheet activities) would rank it in the top 10 largest banks
 - It accounted for more than 20 percent of securities underwritten (averaged over the previous five years).

Contagion

The two classic cases of contagion as a source of systemic importance are Herstatt Bank and Continental Illinois, both in 1984. Although Herstatt was a relatively small institution, its closing had the potential to disrupt the international payments system and imposed nontrivial losses on its counterparties. As discussed in Todd and Thomson (1991), the stated rationale for the FDIC bailout of all Continental Illinois's creditors was the threat that losses would be transmitted to some 2,300 community banks that had correspondent-banking relationships with Continental.⁴ Most recently, the justification for the Federal Reserve of New York's assisted acquisition of Bear Stearns by JPMorgan Chase appears to have been concerns about contagion; in this case, the source of contagion was the potential of loss transmission through the credit-default-swaps market. In principle, the ability to put parameters around contagion as source of systemic importance should enable effective treatments to mitigate contagion.

A financial institution would be considered systemically important if its failure could result in

- Substantial capital impairment of institutions accounting for a combined 30 percent of the assets of the financial system
- The locking up or material impairment of essential payments systems (domestic or international)
- The collapse or freezing up of one or more important financial markets.

A substantial impairment of a payments system or market would be one that is large or long enough to affect real economic activity.⁵

Correlation

Correlation, as a source of systemic importance, is also known as the “too many to fail” problem. Penati and Protopapadakis show how correlated risk exposure contributed to the overexposure of large U.S. banks to borrowers in developing countries.⁶ There are two important aspects of correlation risk. First are the institutions' incentives to take on risks that are highly correlated with other institutions because policymakers are less likely to close an institution if many other institutions would become decapitalized at the same time. This is consistent with the casual observation of herding behavior in the financial system which, in the most recent episode, took the form of finan-

4. Walker F. Todd and James B. Thomson, 1991, “An Insider's View of the Political Economy of the Too Big to Let Fail Doctrine.” In *Public Budgeting and Financial Management: An International Journal*, 3:547–617.

5. It is important to define the parameters of a material or substantial disruption of the payments system carefully; studies are needed to establish these.

6. See Alessandro Penati and Aris Protopapadakis, 1988, “The Effect of Implicit Deposit Insurance on Banks' Portfolio Choices with an Application to International Overexposure,” *Journal of Monetary Economics*, 21: 107–26. For a discussion of the too many to fail problem, see Janet Mitchell, 1988, “Strategic Creditor Passivity, Regulation, and Bank Bailouts,” CEPR discussion paper no. 1780.

cial institutions overexposing themselves to subprime mortgages, mortgage-backed securities, and related mortgage-derivative securities. Second is the potential for largely uncorrelated risk exposures to become highly correlated in periods of financial stress. Andrew Lo calls this phenomenon “phase-locking behavior.”⁷ This means that a group of institutions that would not typically pose a systemic threat might, in certain economic or financial-market conditions, become systemically important. This second form of correlation-driven systemic importance is actually an example of condition- or context-driven systemic importance.

The too-many-to-fail problem is a bit more difficult because it requires that a group or subset of institutions be classified as jointly systemic. As in the case of contagion, putting parameters around correlated risk exposure (including determining what level of correlation across portfolios poses a systemic threat), is the first step towards developing and implementing regulatory treatments. Classifying institutions as systemically important because of correlated risks will mean developing and estimating risk models, using stress testing and scenario analysis, and establishing a set of fundamental risk exposures that financial institutions’ portfolios can be mapped into. Fortunately, some large financial institutions are doing this type of risk modeling and scenario analysis for looking at their own risk profile: their work provides a good foundation for other to work from. Moreover, academic economists have begun thinking about modeling macro-financial risks in the economy, a step towards modeling and quantifying correlated-risk exposure.⁸

What levels of correlated risks would give rise to systemic concerns? Thresholds that would make groups of institutions systemically important include

- The probability that an economic or financial shock would decapitalize institutions accounting, in aggregate, for 35 percent of financial system assets or 20 percent of banking assets
- Potential for economic/financial shock to decapitalize institutions accounting, in aggregate, for 15 percent of financial system assets or 10 percent of banking assets, and for nationwide shares amounting to
 - 50 percent of wholesale or retail payments, or
 - 35 percent of a major credit activity,⁹ or
 - 50 percent of securities processing or 30 percent of securities underwriting (five-year average), or
 - 20 percent of the total number or total value of life insurance products (universal and whole life policies and annuities), or
 - 30 percent of the total number or total value of insurance products (whole and universal life policies, property and casualty policies, annuities, etc.).

Concentration

Dominant firms’ presence in key financial markets or activities can give rise to systemic importance if the failure of one of these firms could materially disrupt or lock up the market. Concentration has two important aspects: the size of the firm’s activities relative to the contestability of the mar-

7. See Andrew W. Lo, 2008, *Hedge Funds: An Analytic Perspective*. Princeton, NJ: Princeton University Press.

8. See for example, Dale F. Gray, Robert C. Merton, and Zvi Bodie, 2006, “A New Framework for Analyzing and Managing Macrofinancial Risks of an Economy,” NBER Working Paper no. 12637, October. Available at <<http://www.nber.org/papers/w12637>>.

9. Fairly broad definitions of credit activities should be used: For instance, the categories might include commercial credit, housing finance, small-business credit, agricultural credit, and consumer credit. Moreover, it is necessary to establish a threshold for categorizing a credit activity as major.

ket. That is, concentration is less likely to make a financial institution systemically important if, other things being equal, the activities of a distressed institution can easily be assumed by a new entrant into the market or by the expansion of an incumbent firm's activities. Hence, it is logical to adjust concentration thresholds to account for contestability.

A financial institution is systemically important if its failure could materially disrupt a financial market or payments system, causing economically significant spillover effects that impede the functioning of broader financial markets and/or the real economy. Thresholds for concentration that would render a financial institution systemically important include any firm (on a consolidated basis) that

- Clears and settles more than 25 percent of trades in a key financial market.
- Processes more than 25 percent of the daily volume of an essential payments system.
- Is responsible for more than 30 percent of an important credit activity.

Conditions/Context

In certain states of nature or some macro-financial conditions, closure policy may not be independent of these conditions. In other words, regulators are reluctant to allow the official failure (closure) of a distressed financial institution under particular economic or financial market conditions if its solvency could have been resolved under more normal conditions. Hence, conditions/context are sources of systemic importance. For instance, Haubrich notes that the New York Fed's reluctance to allow the failure of Long-Term Capital Management resulted largely from the fragility of financial markets at that time—due to the Southeast Asian currency crises and the Russian default.¹⁰ This might explain, in part, why LTCM was treated as systemically important and Amaranth (which was more than twice as big) was not. Another example would be intervention to prevent the bankruptcy of Bear Stearns by merging it (with assistance) into JPMorgan Chase in early 2008, whereas Drexel Burnham Lambert was allowed to enter bankruptcy in early 1990. Firms that might be made systemically important by conditions/context are probably the most difficult to identify in advance. Certainly, stress testing and scenario analysis will be needed to identify them. As discussed above, during periods of financial market distress, phase-locking behavior can cause what would otherwise be slightly correlated risk exposures to become highly correlated. As a result, a group of institutions that would not pose a systemic threat under normal economic or financial-market conditions become systemically important.

Two sets of criteria must be established to classify firms that are systemically important because of context. First is the probability that economic or financial conditions will materialize that produce the state of nature where a firm or group of firms becomes systemically important. Second are the thresholds for systemic importance, which presumably would be based on those used to classify SIFIs according to contagion, concentration, and correlation during normal market conditions; which thresholds are applied would depend on which type of systemic importance the conditions produce.

10. See Joseph G. Haubrich, 2007, "Some Lessons on the Rescue of Long-Term Capital Management," Federal Reserve Bank of Cleveland, *Policy Discussion Paper*. No. 19, April.

Establishing SIFI Categories

One way to classify systemically important financial institutions was suggested in the Geneva report:¹¹ Institutions may be systemic on their own, as part of group, or in a particular context (or state of the economy). Under this classification scheme, there would likely be four or five categories of institutions: Category four would consist of large—but not overly complex—regional financial institutions; category five would consist of community financial institutions. Institutions could migrate between categories as their activities and risks evolve.

Constructing categories permits application of the modern tax principles of horizontal and vertical equity in regulating FISIs. Within each category, every financial institution would be subject to equivalent regulatory treatment and intensity of supervision. Of course, because two institutions could fall under the same category for different reasons, the exact forms of their regulatory taxes would logically differ. In this case, equitable treatment consists of the same degree of regulatory interference (level of regulatory taxes), although the forms of regulation may not be exactly the same. As you move up the categories, firms would be subject to increased levels of regulatory interference and supervisory attention—that is, progressive systemic mitigation—analogue to the prompt corrective action provisions of the Federal Deposit Insurance Corporation Improvement Act of 1991.

Increased regulatory taxes and supervisory scrutiny for higher categories can be justified in terms of economic efficiency and equity. For instance, economic efficiency dictates that regulatory taxes increase to the point where the cost of the last increment of these taxes equals the benefit of imposing them. It is likely that the cost of complying with additional regulations is inversely related to an institution's size and complexity, while the benefits from additional regulation are directly related. Hence, as institutions become larger and more complex, increased regulation and more intensive supervision may be consistent with economic efficiency. Furthermore, to the extent that the wedge between the private and social costs of failure is related to an institution's size and complexity, economic efficiency demands graduated sets of regulatory taxes, which are designed to internalize the externalities.

There are equally compelling arguments for progressively intensive or intrusive regulatory treatments on the grounds of equity as you move up the systemic category ladder. One such is the “level playing field” argument: To the extent that systemic importance confers competitive advantages on an institution, equity concerns would dictate a system of graduated regulatory taxes to remove (or at least minimize) the advantages of being (or becoming) systemically important.

Of the five categories, only three would contain financial institutions that are considered systemically important. The rationale for a five-category system is that it allows for more consistent application of regulatory taxes and supervisory oversight across categories, following the notion that differential supervision and regulation can level the playing field by mitigating the advantages financial institutions derive from systemic importance.¹² The categories would likely be defined as follows:

11. Markus Brunnermeier, Andrew Crocket, Charles Goodhart, Avinash D. Persaud, and Hyun Shin, “Fundamental Principles of Financial Regulation,” 2009. Geneva Reports on the World Economy, 11.

12. Another rationale for systemic categories is that the degree to which markets can or would be allowed to discipline systemic institutions differs across categories, with higher categories containing financial institutions where market discipline is less likely to be effective (or those that are allowed to operate unfettered).

Category 1

Financial institutions that would be considered SIFIs on the basis of size alone (the classic too big to let fail category) or to concentration (the firm is a dominant player in an economically significant financial market or activity)

Category 2

Financial institutions that are systemically important because of interconnectedness (interbank or inter-firm exposure, also known as contagion)

Category 3

Financial institutions that are systemically important as a group because of correlated risk exposures (the too many to fail problem). Also included in category 3 would be financial institutions that are systemically important because of conditions or context

Category 4

Large financial institutions that are not systemically important but whose failure could have economically significant implications for regional economies. This category would include large regional banking companies and large insurance companies.

Category 5

Financial institutions not included in the other categories, consisting primarily of community financial institutions.

Under the philosophy of progressive systemic mitigation, institutions in category 5 would be subject to a basic level of safety-and-soundness regulation and supervisory oversight. No special reporting requirements, targeted risk exams, or other treatments would be necessary.¹³ Category 4 institutions would not face any special capital surcharges or activity restrictions that might apply in categories 1–3, but they would be subject to additional reporting requirements and expected to implement risk management systems and more sophisticated risk controls than category 5 institutions. Moreover, category 4 institutions would be subject to more vigorous supervision than those in category 5.¹⁴

At a minimum, category 3 institutions should be subject to periodic stress tests and be required to have contingency plans in place. Regulatory agencies need to conduct routine scenario analysis and simulations to ascertain the financial system's vulnerability to a correlated-risk event and establish the appropriate regulatory treatment. Such treatment might include actions like portfolio limits, add-on capital requirements, and loss reserves tied to the activities driving the correlated risks. Scenario analysis and risk simulations would be used as part of contingency plans for handling correlated risk events. Stress tests, scenario analysis, risk simulations, and contingency plans would also be part of the operational regulatory system for dealing with institutions that are rendered systemically important by conditions or context.

Progressive systemic mitigation implies that the treatments adopted for category 3 institutions should also be applied to those in categories 1 and 2. For category 2 institutions, it is necessary to

13. These institutions would remain subject to consumer regulation.

14. Recently, Federal Reserve Bank of Cleveland President Sandra Pianalto outlined a new regulatory scheme, "tiered parity," in which financial firms would be separated into three classes or tiers based upon their complexity. As in the present proposal, the regulatory treatment of a firm would be determined according to the tier it is assigned to (with equal regulatory treatment of firms within a tier). To go from the five-category progressive systemic mitigation scheme to the three tiers of the tiered-parity scheme, you simply combine categories 4 and 5 into tier 3 and categories 2 and 3 into tier 2. Category 1 of progressive systemic mitigation is essentially the same as tier 1 of the Cleveland Fed's tiered-parity proposal. For a description of tiered parity, see Sandra Pianalto, "Steps toward a New Financial Regulatory Architecture," Ohio Banker's Day address, April 1, 2009, available at <http://www.clevelandfed.org/For_the_Public/News_and_Media/Speeches/2009/Pianalto_20090401.cfm>.

establish regulatory reporting requirements that allow for inter-bank/inter-firm exposures, direct and indirect, to be tracked and measured. In addition, limits on direct and indirect exposure to counterparties should be instituted, along with specific reserves and add-on capital charges designed to limit contagion across firms. For category 1 institutions, two more types of regulatory treatment need to be added to those faced by category 2 institutions. First, market discipline should be enhanced through mandatory debt-structure requirements, which could include a mandatory subordinated debt requirement and/or reverse convertible debentures.¹⁵ Moreover, a system of double indemnity for shareholders in category 1 institutions could be an effective device for providing socially compatible incentives for those institutions.¹⁶

This is only a partial set of remedies that might be applied progressively to financial institutions in each category. Naturally, the exact regulatory treatments and the nature of the increased supervisory attention would need additional study. After all, as a system of regulatory taxes, progressive systemic mitigation is subject to the regulatory dialectic. Consequently, it is important to understand the unintended consequences of whatever treatments are adopted.¹⁷ Such an understanding will help reduce the deadweight losses of the regulatory regime and increase regulators' ability to respond dynamically to an evolving financial system.

Transparency versus Constructive Ambiguity: Should the List of SIFIs Be Public?

How much information is made public (details about SIFIs, criteria for inclusion in the categories, and the associated regulatory treatment) depends on several factors: the extent to which the supervisory regime utilizes market discipline; whether inclusion on the list has unintended certification effects (or, alternatively, whether ambiguity reduces the credibility of implicit government guarantees); and the degree to which markets can reliably identify the financial institutions that populate the categories.¹⁸ The more information is released—that is, the closer the regime is to full disclosure—the more side issues must be addressed. For instance, how will an institution's inclusion in—or removal from—the list of SIFIs or the promotion (demotion) to a higher (lower) category be communicated? Will there be watch lists of SIFIs that are under consideration for change in status? Would the names of firms that are systemically important because of context/conditions be made public and, if so, what additional information (such as risk models, scenario analysis, and simulations) should be provided?

The choice of disclosure regime would seem to be between transparency (publication of the list of firms in each category) and some version of constructive ambiguity, where selected information is released. The term “constructive ambiguity” has been attributed to former Secretary of State Henry Kissinger;¹⁹ in a diplomatic context, it refers to the use of ambiguous statements as part of a negotiating strategy. However, in the context of central banking and financial markets, the term refers to a policy of using ambiguous statements to signal intent while retaining policy flexibility. In the context of the federal financial safety net, many have argued for a policy of

15. For a discussion of mandatory subordinated debt requirements, see Rong Fan, Joseph G. Haubrich, Peter Ritchken, and James B. Thomson, 2003, “Getting the Most Out of a Mandatory Subordinated Debt Requirement,” *Journal of Financial Services Research*, 24:2/3, 149–79; Reverse convertible debentures are discussed in Mark J. Flannery, “No Pain, No Gain? Effecting Market Discipline via ‘Reverse Convertible Debentures’” (November 2002). Available at <<http://ssrn.com/abstract=352762> or DOI: 10.2139/ssrn.352762>.

16. See Edward J. Kane, 1987, “No Room for Weak Links in the Chain of Deposit Insurance Reform,” *Journal of Financial Services Research*, 1:77–111.

17. For a discussion of the regulatory dialectic, see Edward J. Kane, 1977, “Good Intentions and Unintended Evil: The Case against Selective Credit Allocation,” *Journal of Money, Credit, and Banking*, 9:1, 55–69.

18. For an analysis of how markets discover regulatory information, see Allen Berger, Sally M. Davies, and Mark J. Flannery, 2000, “Comparing Market and Supervisory Assessments of Bank Performance: Who Knows What When?” *Journal of Money, Credit, and Banking*, 32:3, 641–67.

19. <http://en.wikipedia.org/wiki/Constructive_ambiguity>.

constructive ambiguity to limit expansion of the federal financial safety net.²⁰ The notion here is that if market participants are uncertain whether their claim on a financial institution will be guaranteed, they will exert more risk discipline on the firm. In this context, constructive ambiguity is a regulatory tactic for limiting the extent to which de facto government guarantees are extended to the liabilities of the firms that regulators consider systemically important. Uncertainty about whether a firm is considered systemically important and which category it belongs to in the progressive systemic mitigation regime may, at the margin, exert stronger market discipline on institutions than if the list of SIFIs were made public.

For a number of reasons, a policy of supervisory transparency is superior to constructive ambiguity for our purposes. First, constructive ambiguity, broadly viewed, is a competitor of the progressive systemic mitigation regime proposed in this paper. Constructive ambiguity is a supervisory policy aimed at reducing the agency problems associated with firms' systemic importance by creating uncertainty about which firms and creditors might be rescued if a firm fails. Progressive systemic mitigation is an explicit set of regulations and supervisory policies designed to reduce (if not eliminate) the advantages of being systemically important. Under its rules, the social costs of systemic importance would be internalized by the institution and its stakeholders. Second, to the extent that SIFIs would be subject to specific sets of regulatory treatments, it is unlikely that there would be much value in continuing the policy of constructive ambiguity in the proposed progressive systemic mitigation system. After all, markets will probably be able to surmise which firms are on the SIFI list by observing differences in capital structure, balance sheet entries (including footnotes), and intensity of regulatory scrutiny. Finally, the benefit of constructive ambiguity in avoiding an SIFI certification effect that might result from publishing a list of SIFI firms would only affect a small number of firms at the margin. The efficiency gains of avoiding the certification effect on these marginally systemic firms is likely to be swamped by efficiency losses associated with withholding information from the market. Hence, the list of SIFIs, including categories and criteria for inclusion, should be made public, along with a watch list of financial institutions whose SIFI status might change.

An effective system of supervisory transparency entails more than simply disclosing information; it must also include producing information and disseminating it in a useful form.²¹ A case in point is the argument for requiring credit rating organizations to disclose information, such as probabilities of default and loss given default, upon which a rating is based.²² In the supervisory transparency regime, this means that all information used to assign institutions to an SIFI category—including supervisory risk models and their results—should be disclosed.²³ Furthermore, stress tests of SIFIs, along with contingency plans for handling the financial distress of one or more large financial institutions, should be implemented and disclosed.

20. For a discussion of constructive ambiguity as a tool for limiting conjectural government guarantees of bank creditors, see Frederic S. Mishkin, 1999, "Financial Consolidation: Dangers and Opportunities," *Journal of Banking and Finance* 23:2–4, 675–91. For a discussion of constructive ambiguity in the context of lender-of-last-resort policies, see Marvin Goodfriend and Jeffrey M. Lacker, 1991, "Limited Commitment and Central Bank Lending," Federal Reserve Bank of Richmond, *Economic Quarterly*, 85:4, 1–27.

21. For an example of useful information, see the recommendations of the 2001 Working Group on Public Disclosure, which suggests that supervisors release information (such as data about risk exposure) that provides a consistent view of a bank's risk management approach. See Board of Governors of the Federal Reserve System, 2001, SR 01-6: Enhancement to Public Disclosure. Division of Banking Supervision, April.

22. See Charles W. Calomiris, 2008, "The Subprime Turmoil: What's Old, What's New, and What's Next," presentation at the Federal Reserve Bank of Kansas City's symposium, "Maintaining Stability in a Changing Financial System," August 21–22.

23. In cases where releasing a piece of information could result in the disclosure of confidential business information, suppression of the information should be predicated on a careful cost-benefit analysis, which weighs the financial institution's private interests against the benefits to society.

Conclusions and Policy Recommendations

The legacy of economic and financial crises is a post-crisis regime characterized by increased government interference in markets. However, simply increasing the amount of formal regulation and the degree of supervisory oversight and interference is not necessarily the best path forward. Financial market reforms must deal in the least-cost way with the fundamental issues that contributed to the current crisis. One of the most important issues that regulators, legislators, and other policymakers must face is that of systemically important financial institutions.

We propose the study and subsequent adoption of a financial-market supervisory infrastructure in which SIFIs are identified, categorized according to the nature or source of their systemic importance, and subjected to specific regulatory treatments that address the risk these firms impose. The ultimate objective of progressive systemic mitigation is to improve economic efficiency by promoting socially compatible risk incentives for SIFIs and to increase fairness in the financial system by leveling the playing field; the means of achieving this are reducing or removing, through regulatory taxes, the advantages of being systemically important.

Specific regulatory treatments to deal with the four C's of systemic importance (contagion, correlation, concentration, and context/conditions) must be carefully studied before they are adopted. These regulatory treatments might include (but are not limited to) capital surcharges, special reserves, mandatory subordinated debt and/or reverse capital debentures, inter-firm exposure limits, and increased regulatory reporting requirements. Moreover, banking supervisors should be required to conduct periodic systemic risk analyses, stress tests, and other simulations as part of a contingency planning process that would improve regulators' ability to deal in a least-cost manner (combined short- and long-term costs) with the failure of one or more SIFIs. Finally, the information disclosure regime must be addressed when implementing the new supervisory architecture. We argue for full transparency, which includes publishing the list of SIFIs, presumably on a quarterly basis; the criteria for inclusion in an SIFI category; and specific regulatory treatments. In addition, financial institutions whose systemic status may be upgraded or downgraded should be included on a published watch list.

One issue we have not dealt with here is the need to establish a credible resolution process for SIFIs. This, of course, involves careful consideration of the types of resolution authority needed, the funding source for operating any such authority, and the related infrastructure. While a credible resolution process should involve addressing contingency plans as part of the supervisory regime, we leave discussion of the type and form of resolution authority to a companion paper.



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