

Identifying Systemically Important Financial Institutions

By David A. Price and John R. Walter

The Dodd-Frank Act, in addressing systemic risks to the financial system, requires federal regulators to extend a variety of requirements to nonbank financial institutions that are deemed “systemically important.” But how can regulators, and the institutions themselves, best determine whether an institution is systemically important? Research in this area has generated a number of potential approaches.

Following the financial market crisis of 2007-2008, a belief grew among some academics and policymakers that financial markets need more “macroprudential” regulation to avert the next such crisis. In contrast with “microprudential” regulation—the traditional supervision of individual institutions for soundness—macroprudential regulation would have regulators review the effects that problems of one institution might have on others and take actions to prevent or alleviate system-wide damage.

The Dodd-Frank Wall Street Reform and Consumer Protection Act, signed into law by President Obama on July 21, 2010, incorporates macroprudential regulation in a number of its provisions. Among these is Section 113 of the Act, which deals with nonbank financial companies, such as bank holding companies, finance companies, insurers, investment banks, and hedge funds. Section 113 gives the newly created Financial Stability Oversight Council (FSOC) the authority to designate that a nonbank financial company be supervised by the Board of Governors of the Federal Reserve System. The Board of Governors will impose a

variety of significant federal requirements that are new to nonbanks, including heightened standards for capital, riskiness, and activity standards.

The FSOC must designate a nonbank financial company for this regime if the company is systemically important—that is, in the words of the statute, if “material financial distress at the nonbank financial company, or the nature, scope, size, scale, concentration, interconnectedness, or mix of the activities of the nonbank financial company, could pose a threat to the financial stability of the United States.” But what are the right criteria for regulators to use in identifying such firms?

Terms in the statute such as “material financial distress” and “threat to the financial stability of the United States” do not necessarily have clear meanings, which itself makes measurement difficult. This ambiguity reflects the ambiguous nature of the underlying concept “too big to fail,” which is more a construct of policy than of economic theory. Nonetheless, the statute charges the FSOC with making the designation of “systemically important” on the basis of financial-

market considerations, so economists are working to place these concepts in a technical framework.

The Act itself sets out a long, open-ended list of quantitative and qualitative factors for the FSOC to consider, including leverage, off-balance-sheet exposure, the importance of the company as a source of credit, and the amount and nature of its assets and liabilities. From the perspective of regulators and regulated companies, however, it would be useful to have one measure, or a handful of measures, that all parties could use to assess the extent to which a company is a Systemically Important Financial Institution—in other words, its “SIFI-ness.” (Measuring SIFI-ness is also important under the Basel III accords approved last year, which call on bank regulators to require greater loss-absorbing capacity of global SIFIs, or g-SIFIs.)

Asset size is an important consideration, but far from sufficient. Large firms invested in safe assets such as Treasury bills are unlikely to impose losses on other firms. Large equity-financed firms may impose losses on their investors, including other financial institutions, but those losses generally would not have systemic effects that would threaten the country’s financial stability, given that institutional investors normally hold diversified equity portfolios. Large venture capital firms may also impose losses on other financial institutions, but those losses generally would not have systemic effects, given the illiquidity of investments in a venture capital fund, as Douglas Elliott and Robert Litan of the Brookings Institution note in a recent paper.¹

The interconnectedness of firms is also important as an indicator. Firms may be connected through, for example, formal exposures to one another’s distress (e.g., credit exposures, insurance, derivative contracts); through physical connections in the interbank, payment, and settlement systems; or through *de facto* exposure to similar market risks or operational risks.

Another red flag of SIFI-ness is maturity transformation. To be sure, maturity transformation is a valuable function within the financial system; borrowing

short-term and investing long-term is the essence of what banks do. At banks, deposit insurance and the heavy regulation that goes along with it insurance protects against runs that would otherwise arise from maturity mismatch. But nonbank financial companies with long-term assets and short-term liabilities do not have deposit insurance and the associated regulatory apparatus. Runs and loss of funding at nonbank companies were at the center of the 2007-2008 crisis.

Maturity transformation can be difficult to monitor, however, because of the phenomenon of hidden maturity mismatch. On the face of a contract, its terms may define an asset’s or a liability’s maturity as long-term, but if industry expectations allow creditors or depositors to disregard those terms and withdraw credits or deposits on demand, without penalty, then the contract is no longer a reliable source of information for regulators. Moreover, industry norms of this kind magnify the incentive to be the first to withdraw.

Beyond these individual indicators, economists have proposed several empirical measures that are intended to give a consolidated view of a firm’s SIFI-ness. Tobias Adrian of the Federal Reserve Bank of New York and Markus Brunnermeier of Princeton University have proposed the measure “conditional value at risk,” or CoVaR.² Conceptually, their approach is based on an existing risk measure for single firms or single portfolios, value at risk (VaR), and extends it to interactions in risk between one firm and another. The VaR^{*i*} is the level that capital (or some other measure of health) at firm *i* can be expected to fall below a certain percentage of the time, say 5 percent. The level that capital at firm *j* can be expected to fall below, given that it has already fallen to some level at firm *i*, is the CoVaR^{*ij*}. The responsiveness of the VaR of capital at firm *j* to changes in capital at firm *i* is then ΔCoVaR^{ij} . The bigger it is, the tighter the link between the fortunes of firms *j* and *i*. If *j* represents the financial system as a whole, then ΔCoVaR^{ij} is a measure of how much institution *i* adds to systemic risk, measured in terms of how events at *i* change the VaR of the rest of the financial system. Adrian and Brunnermeier estimate ΔCoVaR on a system-wide

basis and an institution-specific basis using system-wide measures of, for example, stock market volatility, liquidity, and the slope of the yield curve, as well as a measure of institutions' portfolio asset returns.

Viral Acharya, Lasse Pedersen, Thomas Philippon, and Matthew Richardson of the Stern School of Business at New York University have proposed the "systemic expected shortfall" measure, or SES.³ An institution's SES is the amount by which a firm's capital falls below a desirable level in an event where the aggregate amount of capital in the banking sector falls below that desirable level. They estimate SES for a range of large financial institutions. Their estimate uses a measure of the institution's leverage to extrapolate losses from a typical moderately bad day to estimate losses in a day of crisis. They find that SES is highly predictive of an institution's contribution to the crisis: SES estimated on pre-crisis data was able to forecast outcomes of the 2009 bank stress tests, the performance of the institution's common stock during the crisis, and the widening of its credit default swap (CDS) spreads during that time.

A third approach, proposed by Stefano Giglio of Harvard University, seeks to determine not a discrete measurement of systemic risk, but an upper and lower bound on the probability of a systemic event.⁴ To determine those bounds, his approach uses the information embedded in a bond's price and the price of a CDS written on that bond. The probability of a single bank failing can be derived from its bond price; the probability of two banks jointly failing can be derived from a bond price and the price of the corresponding CDS contract. Unfortunately, there is no security that pays off if there is a systemic event, that is, if numerous banks fail. Giglio shows, however, that bond and CDS prices still can provide enough information to put bounds on the probability of the systemic event.

All of these measures are of course limited in practice. The first two, Δ CoVaR and SES, necessarily are founded on historical data, in which systemic failures are fortunately very infrequent. While the researchers' tests suggest that one can extrapolate from historical data to predictions of failures with systemic

effects, these statistical regularities may not hold true for the next crisis, which might well have different origins and a different profile than the 2007-2008 crisis. The third proposed measure, with its reliance on present-day bond and CDS prices, may be skewed by the regulators' own actions in designating or not designating certain firms as SIFI—that is, a SIFI designation will surely affect the institution's bond and CDS prices separately from the actual riskiness of the institution's activities. Further research likely will cast additional light on the strengths and limitations of these measures, as well as yielding new methodologies.

The selection of measures of SIFI-ness, and their interpretation, is only partly a technical question. The size of the SIFI net cast by regulators under Dodd-Frank is also, as noted above, a question of policy. A very wide net, causing a large number of firms to be designated as SIFI, has the benefit of reducing the chances that a given shock to these firms will lead to system-wide effects, since such a designation leads to capital requirements and tighter regulation generally. On the other hand, a wide SIFI net is also costly in terms of the regulatory burden borne by the firms, and may also be costly in terms of lost innovation if regulators disfavor (or are perceived as disfavoring) new types of products. ■

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Endnotes

- ¹ Douglas J. Elliott and Robert E. Litan, "Identifying and Regulating Systemically Important Financial Institutions: The Risks of Under and Over Identification and Regulation," Brookings Policy Brief, January 16, 2011.
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- ² Tobias Adrian and Markus K. Brunnermeier, "CoVaR," Manuscript, November 1, 2010.
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- ³ Viral V. Acharya, Lasse H. Pedersen, Thomas Philippon, and Matthew Richardson, "Measuring Systemic Risk," Manuscript, May 2010.
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