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Evaluating Progress in Regulatory Reforms to Promote Financial Stability

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More than five years after the failure of Bear Stearns marked an escalation of the financial crisis, and nearly three years since the passage of the Dodd-Frank Act, debate continues over the appropriate set of policy responses to protect against financial instability. In recent months, there has been, in particular, a renewal of interest in additional measures to address the too-big-to-fail problem. In some respects, the persistence of debate is unsurprising. After all, the severity of the crisis and ensuing recession, and the frustratingly slow pace of economic recovery, have properly occasioned much thought about the structure of the financial system and the fundamentals of financial regulation.

Continuing discussion of these issues is part of a protracted policy debate over financial regulatory reform. Some argue that little has changed and that the needed reform is a single, dramatic policy change (though that single policy differs considerably among those taking this view). Others argue that reforms already enacted are sufficient to ensure financial stability. Still others contend that there has already been *too much* of a regulatory response, which is suppressing credit extension and faster economic recovery.

I think most of us would acknowledge, upon reflection, that a good bit has been done, or at least put in motion, to counteract the problems of too-big-to-fail and systemic risk more generally. At the same time, I believe that more is needed, particularly in addressing the risks posed by short-term wholesale funding markets. This afternoon I would like both to highlight the importance of what has already been accomplished and, at somewhat greater length, to identify what I believe to be the key steps that remain. Before turning to these subjects, though, I begin with a brief reprise of the origins of the

financial crisis, to remind ourselves of the vulnerabilities that led to the crisis and that remain of concern today. It should, but does not always, go without saying that proposed solutions should actually help solve the problems at hand, and do so in a manner that minimizes the costs to otherwise productive activities.

Vulnerabilities Exposed by the Crisis

Beginning in the 1970s, the separation of traditional lending and capital markets activities established by New Deal financial regulation began to break down under the weight of macroeconomic turbulence, technological and business innovation, and competition. During the succeeding three decades these activities became progressively more integrated, fueling the expansion of what has become known as the shadow banking system, including the explosive growth of securitization and derivative instruments in the first decade of this century.

This trend entailed two major changes. First, it diminished the importance of deposits as a source of funding for credit intermediation, in favor of capital market instruments sold to institutional investors. Over time, these markets began to serve some of the same maturity transformation functions as the traditional banking systems, which in turn led to both an expansion and alteration of traditional money markets. Ultimately, there was a vast increase in the creation of so-called cash equivalent instruments, which were supposedly safe, short-term, and liquid. Second, this trend altered the structure of the industry, both transforming the activities of broker-dealers and fostering the emergence of large financial conglomerates.

There was, in fact, a symbiotic relationship between the growth of large financial conglomerates and the shadow banking system. Large banks sponsored shadow banking

entities such as Structured Investment Vehicles (SIVs), money market funds, asset-backed commercial paper conduits, and auction rate securities. These firms also dominated the underwriting of assets purchased by entities within the shadow banking system.

Though motivated in part by regulatory arbitrage, these developments were driven by more than regulatory evasion. The growth and deepening of capital markets lowered financing costs for many companies and, through innovations such as securitization, helped expand the availability of capital for mortgage lending. Similarly, the rise of institutional investors as guardians of household savings made a wide array of investment and savings products available to a much greater portion of the American public.

But these changes also helped accelerate the fracturing of the system established in the 1930s. While the increasingly outmoded regulation of earlier decades was eroded, no new regulatory mechanisms were put in place to control new risks. When, in 2007, questions arose about the quality of some of the assets on which the shadow banking system was based--notably, those tied to poorly underwritten subprime mortgages--a classic adverse feedback loop ensued. Investors formerly willing to lend against almost any asset on a short-term, secured basis were suddenly unwilling to lend against a wide range of assets, notably including the structured products that had become central to the shadow banking system. Liquidity-strained institutions found themselves forced to sell positions, which placed additional downward pressure on asset prices, thereby accelerating margin calls on leveraged actors and amplifying mark-to-market losses for all holders of the assets. The margin calls and booked losses would start another round in the adverse feedback loop.

Severe repercussions were felt throughout the financial system, as short-term wholesale lending against all but the very safest collateral froze up, regardless of the identity of the borrower. Moreover, as demonstrated by the intervention of the government when Bear Stearns and AIG were failing, and by the aftermath of Lehman Brothers' failure, the universe of financial firms that appeared too-big-to-fail during periods of stress extended beyond the perimeter of traditional safety and soundness regulation.

In short, the financial industry in the years preceding the crisis had been transformed into one that was highly vulnerable to runs on the short-term, uninsured cash equivalents that fed the new system's reliance on wholesale funding. The relationship between large firms and shadow banking meant that strains on wholesale funding markets could both reflect and magnify the too-big-to-fail problem. These were not the relatively slow-developing problems of the Latin American debt crisis, or even the savings and loan crisis, but fast-moving episodes that risked turning liquidity problems into insolvency problems almost literally overnight.

However, note that while the presence of too-big-to-fail institutions substantially exacerbates the vulnerability created by the new system, they do not define its limits. Even in the absence of any firm that may individually seem too big or too interconnected to be allowed to fail, the financial system can be vulnerable to contagion. An external shock to important asset classes can lead to substantial uncertainty as to underlying values, a consequent reluctance by investors to provide short-term funding to firms holding those assets, a subsequent spate of fire sales and mark-to-market losses, and the

potential for an adverse feedback loop. An effective set of financial reforms must address both these related problems of too-big-to-fail and systemic vulnerability.

Regulatory Response to Date

As is obvious from the scope of the Dodd-Frank Wall Street Reform and Consumer Protection Act and the amount of activity at the regulatory agencies, reform efforts to date have been extensive. They have also been significant. Without trying to give a full review, let me draw your attention to some of the more notable accomplishments, which can be categorized in three groups.

First, the basic prudential framework for banking organizations is being considerably strengthened, both internationally and domestically. Central to this effort are the Basel III changes to capital standards, which create a new requirement for a minimum common equity capital ratio. This new standard requires substantial increases in both the quality and quantity of the loss-absorbing capital that allows a firm to remain a viable financial intermediary. Basel III also established for the first time an international minimum leverage ratio which, unlike the traditional U.S. leverage requirement, takes account of off-balance-sheet items.

Second, a series of reforms have been targeted at the larger financial firms that are more likely to be of systemic importance. When fully implemented, these measures will have formed a distinct regulatory and supervisory structure on top of generally applicable prudential regulations and supervisory requirements. The governing principle for this new set of rules is that larger institutions should be subject to more exacting regulatory and supervisory requirements, which should become progressively stricter as the systemic importance of a firm increases.

This principle has been codified in Section 165 of the Dodd-Frank Act, which requires special regulations applicable with increasing stringency to large banking organizations.¹ Under this authority, the Federal Reserve will impose capital surcharges on the eight large U.S. banking organizations identified in the Basel Committee agreement for additional capital requirements on banking organizations of global systemic importance. The size of a surcharge will vary depending on the relative systemic importance of the bank. Other rules to be applied under Section 165—including counterparty credit risk limits, stress testing, and the quantitative short-term liquidity requirements included in the internationally-negotiated Liquidity Coverage Ratio (LCR)—will apply only to large institutions, in some cases with stricter standards for firms of greatest systemic importance.

An important, related reform in Dodd-Frank was the creation of orderly liquidation authority, under which the Federal Deposit Insurance Corporation can impose losses on a failed systemic institution's shareholders and creditors and replace its management, while avoiding runs and preserving the operations of the sound, functioning parts of the firm. This authority gives the government a real alternative to the Hobson's choice of bailout or disorderly bankruptcy that authorities faced in 2008. Similar resolution mechanisms are under development in other countries, and international consultations are underway to plan for cooperative efforts to resolve multinational financial firms.

¹ The operative statutory language reads as follows: "In order to prevent or mitigate risks to the financial stability of the United States that could arise from the material financial distress or failure, or ongoing activities, of large, interconnected financial institutions, the Board of Governors shall . . . establish prudential standards for nonbank financial companies supervised by the Board of Governors and bank holding companies with total consolidated assets equal to or greater than [\$50 billion] that . . . are more stringent than the standards and requirements applicable to [other regulated firms] and . . . increase in stringency."

A third set of reforms has been aimed at strengthening financial markets generally, without regard to the status of relevant market actors as regulated or systemically important. The greatest focus, as mandated under Titles VII and VIII of Dodd-Frank, has been on making derivatives markets safer through requiring central clearing for derivatives that can be standardized and creating margin requirements for derivatives that continue to be written and traded outside of central clearing facilities. The relevant U.S. agencies are working with their international counterparts to produce an international arrangement that will harmonize these requirements so as to promote both global financial stability and competitive parity. In addition, eight financial market utilities engaged in important payment, clearing, and settlement activities have been designated by the Financial Stability Oversight Council as systemically important and, thus, will now be subject to enhanced supervision.

As you can tell from my description, many of these reforms are still being refined or are still in the process of implementation. The rather deliberate pace--occasioned as it is by the rather complicated domestic and international decisionmaking processes--may be obscuring the significance of what will be far-reaching change in the regulation of financial firms and markets. Indeed, even without full implementation of all the new regulations, the Federal Reserve has already used its stress-test and capital-planning exercises to prompt a doubling in the last four years of the common equity capital of the nation's 18 largest bank holding companies, which hold more than 70 percent of the total assets of all U.S. bank holding companies. The weighted tier 1 common equity ratio, which compares high-quality capital to risk-weighted assets, of these 18 firms rose from 5.6 percent at the end of 2008 to 11.3 percent in the fourth quarter of 2012, reflecting an

increase in tier 1 common equity from \$393 billion to \$792 billion during the same period.

Gaps in Regulatory Reform

Despite this considerable progress, we have not yet adequately addressed all the vulnerabilities that developed in our financial system in the decades preceding the crisis. Most importantly, relatively little has been done to change the structure of wholesale funding markets so as to make them less susceptible to damaging runs. It is true that some of the clearly risky forms of wholesale funding that existed before the crisis, such as the infamous SIVs, have disappeared or substantially contracted. But significant continuing vulnerability remains, particularly in those funding channels that can be grouped under the heading of securities financing transactions (SFTs).²

Repo, reverse repo, securities lending and borrowing, and securities margin lending are part of the healthy functioning of the securities market. But, in the absence of sensible regulation, they are also potentially associated with the dynamic I described earlier of exogenous shocks to asset values leading to an adverse feedback loop of mark-to-market losses, margin calls, and fire sales. Indeed, some have argued that this dynamic is exacerbated by a “maturity rat race,” in which each creditor acts to shorten the maturity of its lending so as to facilitate quick and easy flight, and in which creditors pay relatively little attention to the recovery value of the underlying assets.³

² For these reasons, there has been an instinct to address various aspects of wholesale funding discretely. Hence the attention paid by the Federal Reserve and other regulators to money market funds, and the steps taken by the Federal Reserve to reduce the risks associated with the extension of intraday credit by clearing banks in triparty repo funding markets. These discrete steps are useful, particularly insofar as they cast light on implicit, but unpriced, support for short-term funding that has been provided by some financial intermediaries. But they do not address head-on the dynamic described in the text.

³ Markus K. Brunnermeier and Martin Oehmke (2013), “The Maturity Rat Race,” *The Journal of Finance*, vol. 68(2) (April), pp. 483-521, <http://onlinelibrary.wiley.com/doi/10.1111/jofi.12005/pdf>.

With respect to the too-big-to-fail problem, as I noted earlier, actual capital levels are substantially higher than before the crisis, and requirements to extend and maintain higher levels of capital are on the way. The regularization and refinement of rigorous stress testing may be the single most important supervisory improvement to strengthen the resilience of large institutions. The creation of orderly liquidation authority and the process of resolution planning advance prospects for increasing market discipline. But questions remain as to whether all this is enough to contain the problem. The enduring potential fragility of a financial system substantially dependent on short-term wholesale funding is especially relevant in considering the impact of severe stress or failure at the very large institutions with very large amounts of such funding.

Concern about the adequacy of policy responses to date is supported by some recent research that attempts to quantify the implicit funding subsidy enjoyed by certain institutions by looking to such factors as credit ratings uplifts, differentials in interest rates paid on deposits or in risk compensation for bank debt and equity, and premia paid for mergers that would arguably place the merged firm in the too-big-to-fail category.⁴ The calculation of a precise subsidy is difficult, and each such effort will likely occasion substantial disagreement. But several measures provide at least directionally consistent results.

⁴ See, for example, Kenichi Ueda and Beatrice Weder di Mauro (2012), "Quantifying Structural Subsidy Values for Systemically Important Financial Institutions," International Monetary Fund Working Paper (May); Stefan Jacewitz and Jonathan Pogach (2013), "Deposit Rate Advantages at the Largest Banks," FDIC Working Paper (April 16); Dale Gray and Andreas A. Jobst (2010), "New Directions in Financial Sector and Sovereign Risk Management," *Journal of Investment Management*, vol. 8, no. 1, pp. 23-38; and Elijah Brewer II and Julapa Jagtiani (2013), "How Much Did Banks Pay to Become Too-Big-To-Fail and to Become Systemically Important?" *Journal of Financial Services Research*, vol. 43, pp. 1-35. Estimating the exact size of this funding advantage depends on a number of assumptions as well as contemporaneous market conditions and is difficult to quantify robustly. Estimates must consider a number of factors, including market participants' beliefs about the likelihood of an institution's failure, the value of a government bailout of debt holders were it to occur, and the likelihood that the government would actually choose to bail out debt holders in the event of a failure.

Key Additional Reform Measures

In sketching out the kinds of steps needed to address these remaining vulnerabilities, let me begin with wholesale funding generally, and then circle back to too-big-to-fail.

Short-Term Wholesale Funding. At a conceptual level, the policy goal is fairly easy to state: a regulatory charge or other measure that applies more or less comprehensively to all uses of short-term wholesale funding, without regard to the form of the transactions or whether the borrower was a prudentially regulated institution. The aspiration to comprehensiveness is important for two reasons. First, the risks associated with short-term funding are as much or more macroprudential as they are firm-specific. From a microprudential perspective, SFTs are low risk, because the borrowing is short-dated, overcollateralized, marked-to-market daily, and subject to remargining requirements. The dangers arise in the tail and apply to the entire financial market when the normally safe, short-term lending contracts dramatically in the face of sudden and significant uncertainty about asset values and the condition of counterparties. A regulatory measure should force some internalization by market actors of the systemic costs of this intermediation.

Second, to the degree that regulatory measures apply only to some types of wholesale funding, or only to that used by prudentially regulated entities, there will be a growing risk of regulatory arbitrage. Ideally, the regulatory charge should apply whether the borrower is a commercial bank, broker-dealer, agency Real Estate Investment Trust (REIT), or hedge fund.

Stating the goal is easy, but executing it is not, precisely because short-term wholesale funding is used in a variety of forms by a variety of market actors. Determining appropriately equivalent controls is a challenging task and, with respect to institutions not subject to prudential regulation, there may be questions as to where--if at all--current regulatory authority resides. And, of course, there is the overarching problem of calibrating the regulation so as to mitigate the systemic risks associated with these funding markets, while not suppressing the mechanisms that have become important parts of the modern financial system in providing liquidity and lowering borrowing costs for both financial and non-financial firms. For all these reasons, it may well be that the abstract desirability of a single, comprehensive regulatory measure may not be achievable in the near term.

Still, at least as a starting point, we would do well to consider measures that apply broadly. One option is to change minimum requirements for capital, liquidity, or both at all regulated firms so as to realize a macroprudential, as well as microprudential, purpose. In their current form, existing and planned liquidity requirements produced by the Basel Committee aim mostly to encourage maturity-matched books. While maturity mismatch by core intermediaries is a key financial stability risk in wholesale funding markets, it is not the only one. Even if an intermediary's book of securities financing transactions is perfectly matched, a reduction in its access to funding can force the firm to engage in asset fire sales or to abruptly withdraw credit from customers. The intermediary's customers are likely to be highly leveraged and maturity transforming financial firms as well, and, therefore, may then have to engage in fire sales themselves. The direct and

indirect contagion risks are high. Thus, the long-term and short-term liquidity ratios might be refashioned so as to address directly the risks of large SFT books.

Similarly, existing bank and broker-dealer risk-based capital rules do not reflect fully the financial stability risks associated with SFTs. Accordingly, higher, generally applicable capital charge applied to SFTs might be a useful piece of a complementary set of macroprudential measures, though an indirect measure like a capital charge might have to be quite large to create adequate incentive to temper the use of short-term wholesale funding.

By definition, both liquidity and capital requirements would be limited to banking entities already within the perimeter of prudential regulation. The obvious questions are whether these firms at present occupy enough of the wholesale funding markets that standards applicable only to them would be reasonably effective in addressing systemic risk and, even if that question is answered affirmatively, whether the imposition of such standards would soon lead to significant arbitrage through increased participation by those outside the regulatory circle.

In part for these reasons, a second possibility that has received considerable attention is a universal minimum margining requirement applicable directly to SFTs. The Financial Stability Board has already issued a consultative paper, and received public comment, on the idea. Under such a regime, all repo lenders, for example, could be required to take a minimum amount of over-collateralization as determined by regulators (the amount varying with the nature of the securities collateral), regardless of whether the repo lender or repo borrower were otherwise prudentially regulated. This kind of requirement could be an effective tool to limit procyclicality in securities financing and,

thereby, to contain the risks of runs and contagion. Of course, it also raises many of the issues that make settling on a single policy instrument so hard to achieve,⁵ and the decision on calibration would be particularly consequential. Still, the concept has much to be said for it and seems the most promising avenue toward satisfying the principle of comprehensiveness. It is definitely worth pursuing.

As you can tell, there is not yet a blueprint for addressing the basic vulnerabilities in short-term wholesale funding markets. Accordingly, the risks of runs and contagion remain. For the present, we can continue to work on discrete aspects of these markets, such as through the diminution of reliance on intraday credit in triparty repo markets that is being achieved by Federal Reserve supervision of clearing banks and through the money market fund reforms that I expect will be pursued by the Securities and Exchange Commission. We might also think about less comprehensive measures affecting SFTs, such as limits on rehypothecation, when an institution uses assets that have been posted as collateral by its clients for its own purposes.⁶ But I do not think that the post-crisis program of regulatory reform can be judged complete until a more comprehensive set of measures to address this problem is in place.

Too-Big-to-Fail. Before discussing policies specifically directed at too-big-to-fail, let me say a word about the capital regime that should be applicable to all banks, on

⁵ To give just one example: Securities lending sometimes involves an exchange of securities for securities and sometimes involves an exchange of cash for securities. Determining whether and/or how to apply a universal margining requirement to securities lending transactions of both varieties would be challenging.

⁶ Rehypothecation of fully paid customer securities held by broker-dealers not only permits a kind of money creation by broker-dealers, it also can put the securities of the customer at risk, as was seen after the Lehman failure, when some clients found that their securities had been reused by the firm's London office in a way that made them difficult to reclaim. In the United States, the Securities and Exchange Commission has long limited, though not prohibited, rehypothecation of customer securities. Other countries may try to limit the practice informally, but have no formal rules. Given the combined macroprudential and investor protection concerns raised by rehypothecation, a review of current U.S. limits, and the adoption of rules by other relevant countries, seems a logical and, relative to some other proposals, feasible step.

top of which any additional requirements for systemically important institutions would be built. The first order of business is to complete the Basel III rulemaking as soon as possible. The required increases in the quality and quantity of minimum capital, and the introduction of an international leverage ratio, represent important steps forward for banking regulation around the world. U.S. banks have increased their capital substantially since the financial crisis began, and the vast majority already have Tier 1 common risk-based ratios greater than the Basel III 7 percent requirements

The new requirements, while big improvements, are not as high as I would have liked, and the agreement contains some provisions I would have omitted or simplified. In coming years we may well seek changes. Indeed, I continue to be a strong advocate of establishing simpler, standardized risk-based capital requirements and am encouraged at the initial work being done on the topic of simplification in the Basel Committee. And we will certainly simplify the final capital rules here in the United States so as to respond to the concerns expressed by smaller banks. But opposing, or seeking delay in, Basel III would simply give an excuse to banks that do not meet Basel III standards to seek delay from their own governments. It would be ironic indeed if those who favor higher or simpler capital requirements were unintentionally to lend assistance to banks that want to avoid strengthening their capital positions.

Turning to specific policies to address too-big-to-fail, the first task is to implement fully the capital surcharge for systemically important institutions, the LCR, resolution plans, and other relevant proposed regulations. But, completion of this agenda, significant as it is, would leave more too-big-to-fail risk than I think is prudent. What more, then, should be done? As I have said before, proposals to impose across-the-board

size caps or structural limitations on banks--whatever their merits and demerits--embody basic policy decisions that are properly the province of Congress.⁷

However, that does not mean there is no role for regulators. On the contrary, Section 165 of the Dodd-Frank Act gives the Federal Reserve the authority, and the obligation, to apply regulations of increasing stringency to large banking organizations in order to mitigate risks to financial stability. In any event, it is unlikely that the problems associated with too-big-to-fail institutions can be efficiently ameliorated using a single regulatory tool. The explicit expectation in Section 165 that there will be a variety of enhanced standards seems well-advised. We should be considering ways to use this authority in pursuit of three complementary ends: (1) ensuring the loss absorbency needed for a credible and effective resolution process, (2) augmenting the going-concern capital of the largest firms, and (3) addressing the systemic risks associated with the use of wholesale funding.

There is clear need for a requirement that large financial institutions have minimum amounts of long-term unsecured debt that could be converted to equity and thereby be available to absorb losses in the event of insolvency. Although the details will, as always, be important, there appears to be an emerging consensus among regulators, both here and abroad, in support of the general idea. Debt subject to this kind of bail-in would supplement the increased regulatory capital in order to provide greater assurance that, should the firm become insolvent, all losses could be borne using resources within the firm. This requirement for additional “gone concern” capital would

⁷ See Daniel K. Tarullo (2012), “Financial Stability Regulation,” speech delivered at the Distinguished Jurist Lecture, University of Pennsylvania Law School, October 10, www.federalreserve.gov/newsevents/speech/tarullo20121010a.htm.

increase the prospects for orderly resolution and, thereby, counteract the moral hazard associated with expectations of taxpayer bailouts. Switzerland has already adopted a requirement of this sort, and similar proposals are being actively debated in the European Union. A U.S. requirement, enacted under the Federal Reserve's Section 165 authority, would both strengthen our domestic resolution mechanisms and be consistent with emerging international practice.

With respect to "going concern" capital requirements, there is a good case for additional measures to increase the chances that large financial institutions remain viable financial intermediaries even under stress. To me, at least, the important question is not whether capital requirements for large banking firms need to be stronger than those included in Basel III and the agreement on capital surcharges, but how to make them so and with what specific risks in mind. In this regard, I would observe that our stress tests and capital-planning requirements have already strengthened capital standards by making them more forward-looking and more responsive to economic developments. As we gain experience, and as the annual process becomes smoother for both the banks and the Federal Reserve, we have the opportunity to enhance the stress tests by, for example, varying the scenario for stressing the trading books of the largest firms, so as to reflect changes in the composition of those books.

As to regulatory measures of capital outside the customized context of stress testing, one approach is to revisit the calibration of two existing capital measures applicable to the largest firms. The first is the leverage ratio. U.S. regulatory practice has traditionally maintained a complementary relationship between the greater sensitivity of risk-based capital requirements and the check provided by the leverage ratio on too

much leverage arising from low-risk-weighted assets. This relationship has obviously been changed by the substantial increase in the risk-based ratio resulting from the new minimum and conservation buffer requirements of Basel III. The existing U.S. leverage ratio does not take account of off-balance-sheet assets, which are significant for many of the largest firms. The new Basel III leverage ratio does include off-balance-sheet assets, but it may have been set too low. Thus, the traditional complementarity of the capital ratios might be maintained by using Section 165 to set a higher leverage ratio for the largest firms.

The other capital measure that might be revisited is the risk-based capital surcharge mechanism. The amounts of the surcharges eventually agreed to in Basel were at the lower end of the range needed to achieve the aim of reducing the probability of these firms' failures enough to offset fully the greater impact their failure would have on the financial system. At the time these surcharges were being negotiated, I favored a somewhat greater requirement for the largest, most interconnected firms.⁸ Here, after all, is where the potential for negative externalities is the greatest, while the marginal benefits accruing from scale and scope economies are hardest to discern. While it is clearly preferable at this point to implement what we have agreed, rather than to seek changes that could delay any additional capital requirement, it may be desirable for the Basel Committee to return to this calibration issue sooner rather than later.

The area in which the most work is needed is in addressing the risks arising from the use of short-term wholesale funding by systemically important firms. The systemic

⁸ See, for example, Daniel K. Tarullo (2011), "Regulating Systemically Important Financial Firms," speech delivered at the Peter G. Peterson Institute for International Economics, June 3, www.federalreserve.gov/newsevents/speech/tarullo20110603a.htm.

risks associated with runs on wholesale funding would, almost by definition, be exacerbated if a very large user of that funding were to come under serious stress. There could also be greater negative externalities from a disruption of large, matched SFT positions on the books of a major financial firm than if the same total activity were spread among a greater number of dealers. Thus, in keeping with the principle of differential and increasingly stringent regulation for large firms, there is a strong case to be made for taking steps beyond any generally applicable measures that are eventually applied to SFTs or short-term wholesale funding more generally.

One possibility would be to have progressively greater minimum liquidity requirements for larger institutions under the LCR and the still-under-construction Net Stable Funding Ratio (NSFR).⁹ There is certainly some appeal to following this route, since it would build on all the work done in fashioning these liquidity requirements. The only significant additional task would be calibrating the progressivity structure. However, there are at least two disadvantages to this approach. First, the LCR and, at least at this stage of its development, the NSFR, both rest on the implicit presumption that a firm with a perfectly matched book is in a fundamentally stable position. As a microprudential matter, this is probably a reasonable assumption. But under some conditions, the disorderly unwind of a single, large SFT book, even one that was quite well maturity matched, could set off the kind of unfavorable dynamic described earlier. Second, creating liquidity levels substantially higher than those contemplated in the LCR and eventual NSFR may not be the most efficient way for some firms to become better

⁹ For more about the LCR and the NSFR, see Bank for International Settlements (2013), “Group of Governors and Heads of Supervision endorses revised liquidity standard for banks,” press release, January 6, www.bis.org/press/p130106.htm.

insulated from the run risk that can lead to the adverse feedback loop and contagion possibilities discussed earlier.

A more interesting approach would be to tie liquidity and capital standards together by requiring higher levels of capital for large firms unless their liquidity position is substantially stronger than minimum requirements. This approach would reflect the fact that the market perception of a given firm's position as counterparty depends upon the combination of its funding position and capital levels. It would also supplement the Basel capital surcharge system, which does not include use of short-term wholesale funding among the factors used to calculate the systemic "footprint" of each firm, and thus determine its relative surcharge.

While there is decidedly a need for solid minimum requirements for both capital and liquidity, the relationship between the two also matters. Where a firm has little need of short-term funding to maintain its ongoing business, it is less susceptible to runs. Where, on the other hand, a firm is significantly dependent on such funding, it may need considerable common equity capital to convince market actors that it is indeed solvent. Similarly, the greater or lesser use of short-term funding helps define a firm's relative contribution to the systemic risk latent in these markets.

If realized, this approach would allow a firm of systemic importance to choose between holding capital in greater amounts than would otherwise be required, or changing the amount and composition of its liabilities in order to reduce the contribution it could make to systemic risk in the event of a shock to short-term funding channels. The additional capital requirements might be tied, for example, to specified scores under an NSFR that had been reworked significantly so as to take account of the

macroprudential implications of wholesale funding discussed earlier. If one wished to maintain the practice of grounding capital requirements in measures of assets, another possibility would be to add as a capital surcharge a specified percentage of assets measured so as to weight most heavily those associated with short-term funding.

To provide a meaningful counterweight to the risks associated with wholesale funding runs, the additional capital requirement would have to be material. The highest requirement would be at just the point where a firm had the minimum required level of liquidity. The requirement then would diminish as the liquidity score of the firm rose sufficiently above minimum required levels. If the requirement were significant enough and likely to apply to any large institution with substantial capital market activities, it might also be a substitute for increasing the capital surcharge schedule already agreed to in Basel.

I readily acknowledge that calibrating the relationship would not be easy, and that the stakes for both financial stability and financial efficiency in getting it right would be significant. But I think this approach is worth exploring, precisely because it rests upon the link between too-big-to-fail concerns and the runs and contagion that we experienced five years ago, and to which we remain vulnerable today. Whether it proves feasible, or whether we would have to fall back on the more straightforward approach of strengthening liquidity requirements for systemically important firms, the key point is that the principle of increasing stringency be applied.

Conclusion

Of late I find myself of two minds on the question of bringing to a close the major elements of regulatory change following the financial crisis. On the one hand, I strongly

believe that all the regulatory agencies should complete as soon as possible the remaining rulemakings generated by Dodd-Frank and Basel III. It is important that banks and other financial market actors know the rules that will govern capital standards, proprietary trading, mortgage lending, and other activities. In fact, we should monitor whether these rules end up having significant unintended effects on credit availability and, if so, modify them in a manner consistent with basic aims of safety and soundness and consumer protection.

On the other hand, I equally strongly believe that we would do the American public a fundamental disservice were we to declare victory without tackling the structural weaknesses of short-term wholesale funding markets, both in general and as they affect the too-big-to-fail problem. This is the major problem that remains, and I would suggest that additional reform measures be evaluated by reference to how effective they could be in solving it.