

## **Daniel K Tarullo: Shadow banking after the financial crisis**

Speech by Mr Daniel K Tarullo, Member of the Board of Governors of the Federal Reserve System, at the Federal Reserve Bank of San Francisco Conference on “Challenges in global finance: the role of Asia”, San Francisco, California, 12 June 2012.

\* \* \*

The three decades preceding the financial crisis were characterized in the United States by the progressive integration of traditional lending and capital markets activities. This trend diminished the importance of deposits as a source of funding for credit extension in favor of capital market instruments sold to institutional investors. It also altered the structure of the financial services industry, both transforming the activities of broker-dealers and fostering the emergence of large financial conglomerates. Although the structure of foreign banking systems was less noticeably changed, many foreign banks drew increasingly on the resulting wholesale funding markets and made significant investments in the mortgage-backed securities that had proliferated in the first decade of this century.

The financial crisis underscored the failure of the American regulatory system to keep pace with these developments and revealed the need for two reform agendas. One must be aimed specifically at the problem of too-big-to-fail institutions. The other must be directed at the so-called shadow banking system, which refers to credit intermediation involving leverage and maturity transformation that is partly or wholly outside the traditional banking system. As I have noted on other occasions, most reforms to date have concentrated on too-big-to-fail institutions, though many of these reforms have yet to be fully implemented. The shadow banking system, on the other hand, has been only obliquely addressed, despite the fact that the most acute phase of the crisis was precipitated by a run on that system. Indeed, as the oversight of regulated institutions is strengthened, opportunities for arbitrage in the shadow banking system may increase.

Today I want to focus on the development of a regulatory reform agenda for the shadow banking system. As those who have been following the academic and policy debates know, there are significant, ongoing disagreements concerning the roles of various factors contributing to the rapid growth of the shadow banking system, the precise dynamics of the runs in 2007 and 2008, and the relative social utility of some elements of this system. Conclusions drawn from these debates will be important in eventually framing a broadly directed regulatory plan for the shadow banking system. However, as it is neither necessary nor wise to await such conclusions in order to begin implementing a regulatory response, I will follow my discussion of the vulnerabilities created by shadow banking with some suggestions for near- and medium-term reforms.

### **Fragility of the shadow banking system**

It is not my purpose here today to discuss the history and complex nature of the shadow banking system. There is a rich and growing academic literature devoted to this task. However, I do want to identify some features of shadow banking that are reasonably well-established and particularly salient for reform efforts.

First, and in many respects foremost, it bears noting that the use of the term “shadow banking” refers not simply to the functions of credit intermediation and maturity transformation. Shadow banking also refers to the creation of assets that are thought to be safe, short-term, and liquid, and as such, “cash equivalents” similar to insured deposits in the commercial banking system. Of course, as many financial market actors learned to their dismay, in periods of stress these assets are not the same as insured deposits.

The years preceding the financial crisis saw a surge in the volume of dollar-denominated, seemingly safe, seemingly liquid financial instruments. The causal interplay of factors leading to this surge is still actively debated. But it seems reasonably clear that both a rise in the demand by investors for safe, liquid assets as tools for precautionary or transactional liquidity and a rise in demand for short-term financing by certain borrowers – notably financial intermediaries looking to fund longer-term assets – played important, probably reciprocally reinforcing roles.

Examples of investor demand for safe, liquid assets are not hard to identify. One source has been foreign official investors, mostly emerging market countries, which invested about \$1.6 trillion in the United States in the four years preceding the crisis, largely in U.S. Treasury and agency securities. Much of this activity arose from the investment of foreign exchange reserves by countries running large current account surpluses. Some of these reserves were undoubtedly built up as a precautionary measure in light of the financial problems in emerging markets during the late 1990s, while others are attendant to policies of managed exchange rates. This official sector demand for safe assets was largely if not entirely focused on U.S. government securities, rather than cash equivalents. But this source of demand absorbed roughly 80 percent of the increase in U.S. Treasury and agency securities over the four-year period, potentially crowding out other investors and thereby increasing their demand for cash equivalents that appeared to be of comparable safety and liquidity.

A second source of demand has been nonfinancial firms, which responded to the market disruptions associated with defaults by Enron and other firms more than a decade ago by boosting their holdings of cash. The pressure to hold large amounts of cash likely increased when a major ratings agency began publishing liquidity risk assessments of nonfinancial firms.

A third source of demand for cash equivalents resulted from the adoption of more elaborate investment strategies by many institutional investors. For example, as more such investors used derivatives or short-selling as part of their overall strategies, they needed cash or cash-like instruments for margining and other collateral purposes. Moreover, of course, as the amount of assets under professional management increased, the demand for safe, liquid investments also inevitably increased, since intermediaries need a place to park funds that are awaiting investment or needed to meet unexpected withdrawals.

The growing demand for safe and liquid assets was met largely by the shadow banking system's creation of assets that were seemingly safe and seemingly liquid.<sup>1</sup> New varieties of shadow-banking activities were created, some pre-existing types grew larger, and the shadow banking system became much more internationalized. For example, the volume of asset-backed commercial paper, or ABCP, grew enormously. Many ABCP vehicles issued short-term, highly rated liabilities and bought longer-term, highly rated securities, often mortgage-backed securities. Many of the vehicles were sponsored abroad, especially by European banks, which issued dollar-denominated ABCP in the U.S. market and bought dollar-denominated assets in the U.S. market. The overall volume of this activity was very large, although the net flows between the U.S. and Europe were not, leaving European bank sponsors of such ABCP vehicles with a huge exposure when market participants stopped believing that ABCP was risk-free.

---

<sup>1</sup> Insured demand deposits at traditional banks can help meet the needs of large investors, but only to a limited extent. Such accounts are unattractive to large investors because of the limited scale of Federal Deposit Insurance Corporation (FDIC) deposit insurance; large deposits are, beyond the insurance cap, effectively unsecured exposures to a single bank, and small deposits at multiple banks are inconvenient. The expansion of FDIC insurance to all noninterest bearing accounts, regardless of size – which occurred in November 2008 and which is scheduled to expire at the end of this year – has made deposits more attractive and more heavily utilized.

It now seems clear that the tail risk associated with many shadow-banking instruments was not understood by many market actors, including both sellers and buyers. An important contributing factor on the buyers' side that helped set the stage for the 2007–2008 financial crisis was the widespread acceptance that risk-free assets could be created by augmenting what was already thought to be a low-risk asset with a promise from a large financial institution to provide liquidity or bear credit losses in the unlikely event that such support might be needed. When, in stressed conditions, the credibility of the promise came into question, the susceptibility to runs increased dramatically.

In some cases, there were explicit contractual provisions for liquidity support or credit enhancements, such as were provided to ABCP vehicles by their sponsoring banks. In other cases, the support was more implicit, and was conveyed in the marketing of the assets or through an historical pattern of providing support. Forms of implicit credit support were present in a variety of important funding channels and, to a considerable degree, persist today. Three examples are money market funds, the triparty repo market, and securities lending.

Money market funds aim to maintain a stable net asset value of one dollar per share and to meet redemption requests upon demand. As such they are the very model of a nonbank “deposit” or cash equivalent.<sup>2</sup> Unlike other mutual funds, money market funds are allowed to round their net asset values to one dollar per share so long as the underlying value of each share remains within one-half cent of a dollar. But a drop in the unrounded net asset value of more than one-half of one percent causes a money fund to “break the buck”, a scenario in which losses, at least in theory, would be passed along to the fund's investors.

However, fund sponsors historically have absorbed losses whenever necessary to prevent funds from breaking the buck, with only two exceptions. Even though they had no legal obligation to do so, sponsors voluntarily supported their funds more than 100 times between 1989 and 2003, presumably because allowing a fund to break the buck would have damaged the sponsor's reputation and franchise. This tendency was well understood by investors. Indeed, a standard reference book on money markets states that a “money fund run by an entity with deep pockets, while it may not have federal insurance, certainly has something akin to private insurance . . . likely to prove adequate to cover any losses sustained by the fund”.<sup>3</sup>

Many money funds sustained significant capital losses when the market for asset-backed commercial paper collapsed in the summer and fall of 2007. As in previous decades, losses at money funds were absorbed by the funds' sponsors. Indeed, money funds were seen as highly safe in 2007 and received large net inflows as concerns about other portions of the financial system increased.

But when, in 2008, the Reserve Primary Fund did not provide support for the relatively small losses at its money market fund, the illusion that money funds were effectively as safe as insured bank accounts was shattered. A general run on money funds ensued. Within two days, investors withdrew nearly \$200 billion from prime money market funds, about 10 percent of their assets. This contributed to severe funding pressures for issuers of commercial paper. The run ultimately prompted – and was stopped by – unprecedented interventions by the Treasury and the Federal Reserve to provide insurance and liquidity support to the industry.

---

<sup>2</sup> See Patrick McCabe (2010), “The Cross Section of Money Market Fund Risks and Financial Crises”, Finance and Economics Discussion Series 2010–51 (Washington: Board of Governors of the Federal Reserve System, September).

<sup>3</sup> Anthony Crescenzi and Marcia Stigum (2007), *Stigum's Money Market*, 4th ed. (New York: McGraw-Hill) p. 1117.

A second example is the triparty repo market, which had grown to about \$2.8 trillion of outstanding financing by early 2007. In general, a repo, or “repurchase agreement”, is the sale of a security with an agreement to repurchase the security at a later date; the economics of repos are similar to that of short-term loans collateralized by longer-term assets. So-called triparty repos, typically used by broker-dealers to raise financing from cash-rich institutions such as money market funds, insurance companies, and some central banks, utilizes a particular settlement mechanism. The third party in this triparty market is a clearing bank, which handles settlement through accounts held at that institution by the broker-dealers who are cash borrowers and the cash lenders. Because the composition and size of broker-dealers’ inventories can change rapidly with the levels of trading activity, broker-dealers find the very flexible and inexpensive short-term financing offered by triparty repos to be extremely attractive. To the extent that this borrowing appeared riskless to lenders, broker-dealers were potential suppliers through triparty repos of the safe, liquid assets that were in such demand.

Broker-dealers who borrow in the triparty repo market want to have access to their securities for routine trading purposes – for example, to make deliveries to clients during the day. To allow for that, the market developed a critical operational feature called the “daily unwind”. Each day, the clearing banks “unwind” all repo trades, returning securities to borrowers and cash to lenders, even for longer-dated term transactions. However, the securities still require financing during the day. To this end, borrowers rely on intraday overdrafts at the two major clearing banks. At the end of the day, the transactions are “re-wound”. Thus, the risks associated with the portfolios of securities are fully transferred twice each day.

The lenders in this market widely believed that the two clearing banks would always unwind their maturing trades in the morning, returning cash to their account, despite no contractual provision requiring that the clearing banks do so. The fact that lenders believed they were protected in this way by the clearing bank helped perpetuate the illusion that, particularly when lending overnight, they were invested in a money-like asset that would *always* be highly liquid and safe, even though in reality the borrower was usually an entity that could go bankrupt.

This illusion faded as the financial crisis progressed. Significant strains were created by concerns about the financial strength of the broker-dealers, uncertainty about the value of the underlying collateral, and belated recognition that the clearing banks were not contractually obligated to unwind maturing trades. Only when the prospect of dealer failures became very real – for example, in the case of Countrywide’s broker-dealer affiliate in August 2007 and Bear Stearns in March 2008 – did the lenders appear to see these risks clearly. In addition, the presumed stabilizing function of collateral was weakened, since a default by a dealer or clearing bank could leave lenders with securities posted as collateral that they had no desire, operational capacity, or even, in some cases, legal authority to hold, or at least liquidate in an orderly way. The response at that point was to flee, ignoring the protection putatively afforded by collateral.

Only because of unprecedented official-sector action did the triparty repo market not suffer the same kind of disastrous run as did money market funds. A broad run on triparty repos would have severely impacted all major broker-dealers and thus the U.S. securities industry as a whole. The Primary Dealer Credit Facility – instituted on an emergency basis immediately after the failure of Bear Stearns – provided emergency lending to dealers, injected liquidity into the system, and provided a backstop that reassured markets. This public-sector support prevailed where implicit private-sector support had come into question, and helped stabilize the triparty repo market.

My third example of a funding channel characterized by tacit credit support is the securities lending market, which is driven in large part by demand for securities by financial institutions wanting to establish short positions or needing collateral to support other transactions. Securities lenders in this market are typically owners of large pools of securities such as

pension plans, endowments, and insurance companies. The securities borrower posts collateral, usually cash in the United States, which a custodian bank then typically invests on behalf of the securities lender in supposedly safe and liquid investments, including money market funds, triparty repos, and other short-term instruments. The gains from these reinvestment activities provide a significant amount – in some cases, all – of the compensation to the securities lender associated with participating in the lending program.<sup>4</sup>

The custodian banks all but universally provided a contractual indemnification to the securities lender that required them to absorb any losses to the securities lenders if the securities were not returned. But the investment returns, and risk of loss on the reinvestment of cash collateral that would have to be returned to the borrowers of securities, generally were not covered by such indemnifications. Nonetheless, a number of securities lenders seemed to believe otherwise, and in many cases their expectations were fulfilled as custodian banks agreed during the financial crisis to bear at least some of the losses from cash collateral reinvestment programs.

Although the experiences of money market funds, triparty repos, and securities lending vary in the details, they all share a common underlying pathology: Offering documents with stern warnings notwithstanding, explicit and implicit commitments combined with a history of discretionary support to create an assumption, even among sophisticated investors, that low-risk assets were free of credit and liquidity risk – effectively cash, but with a slightly higher return. This risk illusion led to pervasive underpricing of the risks embedded in these money-like instruments and made them an artificially cheap source of funding. The consequent oversupply of these instruments contributed importantly to systemic risk.

Reliance on private mechanisms to create seemingly riskless assets generally worked in the relatively calm years leading up to the financial crisis and, to some extent, well into the crisis. But, in many cases, discretionary support came into question at the time of acute financial-market stress, precisely when it was needed most, as questions arose about the ability or willingness of large financial institutions to follow through on their implicit commitments. Investors were reminded of their potential exposure, leading to wholesale and sometimes disorderly flight. The unwinding of this risk illusion helped transform a dramatic correction in real estate valuations – which itself would have had serious consequences for the economy – into a crisis that threatened the entire financial system.

### **Shaping a regulatory response**

Ideally, a regulatory response to the shadow banking system would be grounded in a full understanding of the dynamics that drove its rapid growth, the social utility of its intermediation activities, and the risks they create. Such a response would be comprehensive, meaning that it would cover in an effective and efficient manner any activities that create these vulnerabilities, without regard to how the activities were denominated, what transaction forms were used, or where they were conducted. Of course, many of the key issues are still being debated, and even those who agree on the desirability of a comprehensive response may differ on its basic form.

We should continue to seek the analytic and policy consensus that must precede the creation of a regulatory program that meets these conditions. More work is needed on fundamental issues such as the implications of private money creation and of intermediaries behaving like banks but without bank-like regulation. These implications are potentially quite profound for central banking and banking regulation, considering that the shadow banking

---

<sup>4</sup> Much of the attention devoted to securities lending in the wake of the crisis focused on the program run by AIG. In addition to general issues involving the reinvestment of cash collateral, AIG's securities lending program had more specific and fundamental flaws that go beyond the concerns discussed here.

system has caused the volume of money-like instruments created outside the purview of central bank and regulatory control to grow markedly.

But regulators need not wait for the full resolution of contested issues or the development of comprehensive alternatives, nor would it be prudent for them to do so. We should act now to address some obvious sources of vulnerability in the financial system. I believe that the foregoing discussion of implicit support for various shadow banking instruments helps identify areas where misunderstanding and mispricing of risk are more likely, with the result that destabilizing runs are a real possibility.

Let me then suggest three more-or-less immediate steps that regulators here and abroad should take, as well as a medium-term reform undertaking.

First, we should create greater transparency with respect to the various transactions and markets that comprise the shadow banking system. For example, large segments of the repo market remain opaque today. In fact, at present there is no way that regulators or market participants can precisely determine even the overall volume of bilateral repo transactions – that is, transactions not settled using the triparty mechanism. It is encouraging that the Treasury Department's new Office of Financial Research is working to improve information about this market, while the Securities and Exchange Commission is considering approaches to enhanced transparency in the closely related securities lending market.

Second, the risk of runs on money market mutual funds should be further reduced through additional measures to address the structural vulnerabilities that have persisted even after the measures taken by the SEC in 2010 to improve the resilience of those funds. The SEC is currently considering several possible reforms, including a floating net asset value, capital requirements, and restrictions on redemption. Clearly, as suggested by Chairman Schapiro, action by the SEC to address the vulnerabilities that were so evident in 2008, while also preserving the economic role of money market funds, is the preferable route. But in the absence of such action, there are several second-best alternatives, including the recent suggestion by Deputy Governor Tucker of the Bank of England that supervisors consider setting new limits on banks' reliance on funding provided by money market funds.

A third short-term priority is to address the settlement process for triparty repurchase agreements. Some progress has been made since 2008, but clearly more remains to be done. An industry-led task force established in 2009 orchestrated the implementation of some important improvements to the settlement process. The unwind, with its reliance on vast amounts of discretionary and uncommitted intraday credit from the two clearing banks, was pushed to later in the day, reducing the period during which the intraday credit was extended. In addition, new tools were developed for better intraday collateral management, and an improved confirmation process was instituted.

Though these were useful steps, the key risk reduction goal of the effective elimination of intraday credit has not yet been achieved. A second phase of triparty reform is now underway, with the Federal Reserve using its supervisory authority to press for further action not only by the clearing banks, who of course manage the settlement process, but also by the dealer affiliates of bank holding companies, who are the clearing banks' largest customers for triparty transactions. But this approach alone will not suffice. All regulators and supervisors with responsibility for overseeing the various entities active in the triparty market will need to work together to ensure that critical enhancements to risk management and settlement processes are implemented uniformly and robustly across the entire market, and to encourage the development of mechanisms for orderly liquidation of collateral, so as to prevent a fire sale of assets in the event that any major triparty market participant faces distress.

In the medium term, a broader reform agenda for shadow banking will first need to address the fact that there is little constraint on the use of leverage in some key types of transactions. One proposal is for a system of haircut and margin requirements that would be uniformly applied across a range of markets, including OTC derivatives, repurchase agreements, and

securities lending. Work is ongoing to develop globally uniform margin requirements for OTC derivatives, but there is not yet an agreement to develop globally uniform margin requirements for securities financing transactions. Such a margining system would not only limit leverage, but – to the extent it is in fact uniform – also diminish incentives to use more complicated and less transparent transactional forms to increase leverage or reduce its cost. Some proponents suggest that such systems of uniform haircut and margin requirements could also dampen the observed procyclical character of many collateralized borrowings that results from changes in margins and haircuts following general economic or credit trends.

## **Conclusion**

The shadow banking system today is considerably smaller than at the height of the housing bubble six or seven years ago. And it is very likely that some forms of shadow banking most closely associated with that bubble have disappeared forever. But as the economy recovers, it is nearly as likely that, without policy changes, existing channels for shadow banking will grow, and new forms creating new vulnerabilities will arise. That is why I suggest what is, in essence, a two-pronged agenda: first, near-term action to address current channels where mispricing, run risk, and potential moral hazard are evident; and, second, continuation of the academic and policy debate on more fundamental measures to address these issues more broadly and proactively.