



FINANCIAL ECONOMISTS ROUNDTABLE

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Statement on **How to Manage and Help to Avoid Systemic Liquidity Risk**

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The Financial Economists Roundtable (FER) is a group of senior financial economists, who have made significant contributions to the finance literature and seek to apply their knowledge to current policy debates. The Roundtable focuses on microeconomic issues in investments, corporate finance, and financial institutions and markets, both in the U.S. and internationally. Its major objective is to create a forum for intellectual interaction that promotes in-depth analyses of current policy issues in order to raise the level of public and private policy debate and improve the quality of policy decision.

FER was founded in 1993 and meets annually. Members attending a FER meeting discuss specific policy issues on which statements may be adopted. When a statement is issued, it reflects a consensus among the majority of the attending members and is signed by all members supporting it. The statements are intended to increase the awareness and understanding of public policy makers, the financial economics profession, the communications media, and the general public. FER statements are distributed to relevant policy makers and the media.

The following statement on “How to Manage and Help to Avoid Systemic Liquidity Risk” is the result of a discussion at FER's annual meeting on July 17-19, 2010 at the Grand Hyatt Hotel, Newport, Rhode Island.

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Statement of the Financial Economist Roundtable (FER)

on

How to Manage and Help to Avoid Systemic Liquidity Risk

Summary

In the summer of 2010, when legislative and regulatory responses were being finalized to address financial institution and market liquidity issues, the Financial Economists Roundtable, meeting in Newport, Rhode Island, developed principles to address both market-wide and institution-specific liquidity problems that were exposed by the 2007-2008 financial crisis. These principles can be used to assess the strengths and weakness not only of the legislation that was passed but also of the regulatory proposals promulgated to implement the law as they continue to emerge. The group identified a list of more than eight such principles. For example, the Roundtable urged that regulations seek to make the failures of large complex institutions independent events in order to minimize spillover effects; to ensure that the interdependence of capital and liquidity requirements were recognized, that such requirements were flexible and cost effective; to ensure that central banks continued to provide lender-of-last-resort lending against sound collateral; and to ensure timely and accurate transparency of institutions' risk exposures. The Roundtable concluded that the crisis revealed critical weaknesses in the tri-party repo market. It recommended consideration of reforms to the tri-party repo market including moving such transactions to organized exchanges, reducing the dependence upon two private sector financial institutions to operate that market's infrastructure. Additional useful reforms would include limiting daylight overdrafts, imposing margin requirements on counterparties to limit systemic risk and prohibiting re-hypothecation. Finally, the Roundtable believes that improved transparency of transactions and prices would enhance monitoring by responsible regulatory agencies.

When the financial crisis first surfaced in August of 2007, financial regulators in the U.S. and elsewhere diagnosed the market disruptions as a traditional liquidity problem. Some large financial firms suddenly had difficulty funding themselves in the wholesale money markets, as reflected in credit spreads such as the TED spread (the difference between the three month London Interbank Borrowing Rate (LIBOR) and three month Treasury rate). LIBOR rates increased from about 25 basis points to over 225 basis points on October 20, 2007. In some markets, such as the asset-backed commercial paper market, funding essentially stopped. Disruptions were also evident in the bi- and tri-party repo markets.¹

Policy makers responded with traditional remedies that attempted to channel funds to large complex financial institutions, investment banks as well as banks that were experiencing funding difficulties.² For a while, markets calmed and spreads narrowed, but rates and spreads remained significantly above pre-crisis levels. The asset backed commercial paper market—especially that portion related to the funding of securitized subprime mortgages—continued to shrink in size and new issuance through the end of 2007 and into 2008. In March 2008, Bear Stearns failed and the Federal Reserve Bank of New York subsidized its acquisition by JPMorgan Chase through the creation of a special purpose vehicle. Funding difficulties continued for some large financial institutions across the world throughout the summer of 2008 until finally a series of events in early fall of 2008 made clear that the solvency problems afflicting the financial sector were much more profound than a simple shortage of liquidity in the major money markets. These events included the placement of Freddie Mac and Fannie Mae into conservatorship by the U.S. government, the bankruptcy of Lehman Brothers, the rescue of the insurance giant AIG, and finally, after a failed first attempt, the passage of the Emergency Financial Stabilization Act of 2008 to provide funding for policy makers to avert a possible systemic crisis. The program led to the creation of a federal capital infusion program that injected taxpayer funds into Chrysler and General Motors and bolstered the capital positions of the nation’s largest financial institutions as well as many other financial institutions—both banks and nonbanks—that, arguably, were not all systemically important.

The fear that the U.S. faced a systemic financial crisis in the form of a meltdown of the financial system if major U.S. financial firms were forced into bankruptcy exposed the fact that the year-long liquidity crisis and subsequent developments were symptomatic of a much deeper problem. In particular, the failures and severe financial distress of several large complex financial institutions, the abrupt shutdown of the asset-backed commercial paper markets, rising credit spreads, and funding problems in the repo markets all exposed the fact that the protracted liquidity squeeze in financial markets was rooted in uncertainty about the value of contracts and the financial condition of many large institutions. At the same time, the

¹ There are many interpretations as to the causes and role of different financial instruments, such as credit default swaps, in the crisis as well as the importance of commercial paper and the repo markets. See for example, Stulz, R., “Credit Default Swaps and the Credit Crisis,” *Journal of Economic Perspectives*, Vol. 24, no.1, Winter 2010: 73-92; Krishnamurthy, A., “How Debt Markets Have Malfunctioned in the Crisis,” *Journal of Economic Perspectives*, Vol. 24, no.1, Winter 2010:2-28; Brunnermeier, M., “Deciphering the Liquidity and Credit Crunch 2007-2009,” *Journal of Economic Perspectives*, 23(1):77-100; Gorton, G and A. Metrick (2009), “Securitized Banking and the Run on Repo,” NBER Working Paper 151223; Kacperczyk, M and P. Schnabl (2010), “When Safe Proved Risky: Commercial Paper During the Financial Crisis of 2007-2009,” *Journal of Economic Perspectives*, Vol. 24, no.1, Winter 2010:29-50; Ewerhart, C and J. Tapking, “Repo Markets, Counter party Risk, and the 2007/2008 Liquidity Crisis,” European Central Bank, Working paper no. 909, June 2008.

² See http://www.newyorkfed.org/markets/Forms_of_Fed_Lending.pdf which details Federal Reserve efforts concentrated on ensuring that the Primary Dealers had access to funds and acceptable collateral.

crisis exposed weaknesses in the structure of OTC derivative and tri-party repo markets, just to name two.³

Once financial markets finally calmed down, as reflected in the decline in the TED spread to about 100 basis points, Congress turned its attention in 2010 to financial and regulatory reforms. The efforts culminated with passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act, which was designed to address the problems exposed by the crisis and the belief that some institutions were too-big-to-fail. However, the details concerning implementation were left to the responsible regulatory authorities who are now beginning to put forward proposed regulations. Other countries have embarked upon financial reform efforts; some have been piecemeal while others have been more comprehensive. A common thread has been to provide for the imposition of both new liquidity requirements to be imposed upon financial institutions and tightened regulatory capital standards, the precise structure of which are under consideration in the U.S. and by the Basel Committee. Left unanswered were questions about the nature of the so-called liquidity problems, why they occurred, what reforms might be needed in clearing and settlement systems like the tri-party repo market, and what might be done to minimize the chances that another systemic crisis might occur.

FER Policy Recommendations

When the Financial Economist Roundtable held its annual meeting in (July of) 2010, specific regulatory proposals were only in the development phase and not publicly available. Hence they were not discussed at the meeting. Instead, building on its work and statement of the previous year—which addressed a number of market structure and liquidity concerns with respect to risk from OTC derivatives—the Roundtable focused its attention on liquidity issues more broadly, and developed a series of recommendations or principles that address both market-wide and institution-specific liquidity problems. The FER believes that these principles can be used to assess the strengths and weakness not only of the legislation that was passed ,but also of the regulatory proposals to implement the law as they emerge.

The following is a list of the key recommendations and principles that emerged during the Roundtable discussions:

R.1. Regulators should devise regulations and seek changes to financial market infrastructures that would ensure that the inevitable failure of one or more significant market participants would remain isolated events with minimal negative spillover effects on other institutions and the economy more broadly.

R.2. Both liquidity and capital requirements for regulated financial institutions should be integrated in ways that recognize their interdependence and that ensure both substitutability—to the extent that liquidity and capital requirements provide alternative means of addressing the same ends—and complementarity when considering the

³ Problems in the Over the Counter Derivatives markets were widely viewed as contributing to the opacity of financial institutions' balance sheets and liability structure and also because of their structure created the potential for systemic risk. The recently passed Dodd-Frank Wall Street Reform and Consumer Protection Act provides for moving many derivative transactions to organized exchanges. The issues surrounding derivatives were considered in the Roundtable's statement last year "Reforming the OTC Derivatives Markets."

protections afforded by capital and liquidity.

R.3. Liquidity requirements should aim to mitigate systemic risks to the financial system and should therefore give safe harbor to institutions that manage their affairs in ways designed to avoid creating systemic risks.

R.4. Liquidity requirements should be flexible so that regulators can permit the drawing down of accumulated liquidity reserves when needed (for example, during a crisis). One potentially desirable approach would be to structure liquidity requirement policies that mimic prompt corrective action sanctions that accelerate as liquidity ratios decline through pre-specified tranches. This would permit institutions to use accumulated liquidity reserves but at an increasing cost and with increased monitoring by regulators.

R.5. Regulations on both liquidity and capital should recognize the costs associated with meeting such requirements. Insuring against all liquidity risk is likely to be prohibitively costly, just as fail-safe capital requirements are likely to be costly and inefficient.

R.6. Regardless of what other measures are put in place, central banks should continue to perform their traditional lender-of-last-resort function by lending against sound collateral. It should be noted that the Dodd-Frank Act added significant new restraints to the Federal Reserve's lender of last resort function.

R.7. Policies should ensure that both institutions and regulators have accurate and timely disclosure of risk position and asset prices in order to manage risk exposures and to limit systemic risks.

R.8. Policy makers, and particularly the Federal Reserve, should explore policies that encourage—but do not mandate—the movement of tri-party repo transactions to organized exchanges and centralized clearing and settlement systems with the aim of eliminating the potential conflicts of interest and systemic risk associated with the present arrangement that relies on only two private-sector financial institutions.

R.8.a. Should the two private institutions continue to dominate the market, authorities should ensure that the tri-part repo activity be separately capitalized and capable of continuing on a stand-alone basis regardless of the condition of either of the institutions. The objective should be to avoid the transfer of risk from either of these institutions to the broader market.

R.8.b. Limits on daylight overdrafts should be controlled and supervised to ensure appropriate collateral requirements and other trading conventions.

R.8.c. Consideration should be given to imposing margin requirements on counterparties to limit systemic risk.

R.8.d. Procedures should be established to permit and to define substitution of securities for both collateral and in the case of a default.

R.8.e. Whether public or private, the centralized system should have *ex ante* loss sharing rules that are publicly disclosed and enforceable.

R.8.f. Consideration should be given to structuring repo transactions without recourse rather than with recourse to avoid the possibility of unwinding transactions that might put counterparties into financial distress.

R.8.g. Consideration should be given to prohibiting re-hypothecation.

R.8.h. Transparency of post-trade prices and collateral values should be encouraged and made immediately available to the appropriate regulators and, with a brief lag, to the public.

Background Concepts of Liquidity Risk and Its Relationship to Capitalization and Solvency

Liquidity risk can take several forms. Individual institutions may sometimes face “funding risks”; that is, they won’t be able to roll over demandable or other debt or meet OTC derivative contracts in the market when they come due. More broadly, markets may experience liquidity problems when there are disruptions of the orderly sale and purchase of risky securities. When such market illiquidity risks materialize, institutions may suddenly find themselves unable to participate as either buyers or sellers in what otherwise had been a reasonably deep secondary market—one that generally absorbs relatively large transactions with minimal (if any) impact on price or transactions costs.

Liquidity problems have affected financial markets from time to time. For example, early in the development of financial markets in the late 19th and early 20th century when currency and deposits were freely convertible into specie, occasional liquidity problems emerged when institutions were faced with sudden demands for specie and reserve holdings were insufficient. Some of these problems were due to financial structure flaws while others were due to information problems.⁴ In those instances, institutions may have been solvent, in the sense that the value of their assets was greater than the value of their liabilities, but they were unable to convert non-specie assets into specie quickly enough to meet demand. But a short-term liquidity problem for one bank could suddenly become a systemic risk problem for many banks if it led to the conversion of reserves held with other banks into specie. This behavior could turn a short-term liquidity problem at one bank into a systemic problem. The important point, however, is that not all traditional short-term liquidity problems necessarily resulted in system-wide systemic risk problems.

The first efforts to regulate such problems involved the imposition of liquidity requirements. That is, institutions were required to hold prescribed amounts of specie in their vaults to meet unanticipated demands to convert currency into gold. As currency issuance declined in importance relative to deposits as a funding source for U.S. banks, institutions began to hold assets that could be quickly sold at low cost to meet demands for withdrawals. In periods when the U.S. didn’t have a central bank, clearing houses sometimes acted as a conduit that enabled firms experiencing demands for withdrawals to liquidate assets quickly. In the U.K. the Bank of England served this function, even though it was a private bank in the early years. As central banks evolved or began to be created, discount window loans served as a source of backup liquidity that enabled banks to avoid large losses from forced firesales of assets to meet withdrawal demands.

⁴ For example, in the U.S. the National Banking Act of 1864 provided for the pyramiding of required reserves at other commercial banks such that a liquidity problem in one institution could quickly be transformed into a systemic liquidity problem for many institutions.

Liquidity concerns arising from a sudden shock to one institution, or a sudden unanticipated demand for funds from otherwise financially sound institutions, can be remedied by “Bagehot-type” central bank lending at a penalty rate on good collateral or by having adequate liquidity on hand to meet sudden demands for funds by depositors. Uncertainty about the value of a financial institution’s assets relative to its liabilities can lead to runs by creditors as some depositors and creditors attempt to get their funds before others. At times an institution may actually experience solvency problems that create panic demands for funds by depositors seeking to avoid the risk and costs of a potential bankruptcy. Such runs can become systemic when uncertainty about the solvency of one institution creates a “lemons” problem where creditors can’t distinguish healthy from unhealthy institutions. In cases that are fortunately rare, such solvency concerns can arise about many institutions, either because of correlated risks or the public perception that several other institutions are heavily exposed to an institution that is known or thought to be insolvent. Either large suspected direct exposures or highly correlated external exposures can trigger a system-wide panic. Such solvency driven liquidity problems can have significant negative externalities that can threaten the financial system as a whole.

The systemic risks posed by the sudden efforts of many institutions to liquidate assets are particularly great when combined with funding maturity mismatches between assets and liabilities and with extreme leverage, both of which characterized the business models of many large, complex financial institutions in the U.S. and elsewhere in the world. In such cases, even relatively small price effects of fire-sales of assets, or increases in haircuts on collateral, can suddenly create economic insolvency where the market value of assets is less than the market value of liabilities.

Illiquidity problems that persist for a long time are almost always associated with an insolvency shock and become a source of public policy concern about possible systemic risks, and the current financial crisis is no exception. Such systemic risk events have the potential for protracted endogenous effects on prices, since multiple insolvencies shut down financial markets and reduce economic growth. Examples of perceived systemic liquidity problems include the classic banking panics of the late 19th century and the panic of 1907, the wholesale banking runs, such as those that affected Continental Illinois in the U.S. and Northern Rock in the U.K., the action of the tri-party repo banks in the case of AIG, and the novation issues that faced Bear Stearns.

It is usually difficult for policy makers to distinguish between traditional liquidity problems and solvency concerns, in large part because solvency-driven runs often initially appear to be short-term, traditional liquidity problems as institutions attempt to liquidate assets in an attempt to meet creditors’ demands. Under normal circumstances, a solvency-driven liquidity problem can be resolved relatively quickly if healthy institutions are able credibly to reveal to the market that they are indeed solvent. Moreover, they should have strong economic incentives to do so.

Regulatory approaches to reduce the likelihood of solvency-driven runs typically rely on capital requirements to ensure that an institution has sufficient resources to absorb unanticipated losses that might otherwise threaten its economic solvency. Here the link between capital requirements (that accurately reflect the ability to absorb loss) and liquidity requirements becomes more apparent. An institution with a huge capital cushion can absorb larger losses from the forced sale of assets while an institution with lower capital may be protected by having a larger pool of high quality assets, such as government securities, that

can be sold with fewer negative price effects that have to be absorbed by its equity. Of course, higher capital requirements means *ceteris paribus* less leverage and a lower return on equity, while a larger liquidity cushion typically comes from holding lower yielding assets. For this reason, capital requirements can partly substitute for liquidity requirements and vice versa. But, of course, both have costs to financial institutions and must be balanced by regulators.

Against this general discussion of liquidity issues, the liquidity problems experienced during the recent financial crisis were unique in some ways but not in others. There were restrictions on access to and withdrawal of wholesale market funding for individual institutions, but not runs by retail customers in the traditional sense. The first institutions to experience problems, both in the U.S. and U.K., specialized in mortgages, including Countrywide, IndyMac, Northern Rock, and some sponsored hedge funds that were active in mortgage securitization (especially low quality, subprime mortgages). The initial funding problems soon spread to the few primary dealers as uncertainty about the quality of the collateral they were pledging to obtain short-term funding in money markets was increased by problems in the U.S. housing market. Much of that collateral took the form of mortgage-backed securities, and many of these firms were active in securitizing those assets. The extended period of the funding problems and uncertainty about asset values exposed the capital deficiency and solvency problems in many of the large financial institutions. The crisis exposed a deadly vulnerability that had been created by the combination of high leverage and extreme maturity mismatching by large institutions that were funding portfolios of longer term assets (like MBS) with overnight or very short-term borrowing. The crisis also revealed weaknesses in bank supervisory and regulatory regimes and accounting conventions since most of the institutions that experienced funding problems were reported as being adequately capitalized, when in fact their levels of capital were severely deficient.

The crisis also generated policy makers' fears of severe systemic risk since markets were viewed as having frozen up because of uncertainty about the solvency of counterparties, and some markets were critically dependent on some of the weakened financial institutions for back office operations and funding, which would be threatened if one of several key institutions were to fail.

One such market was the tri-party repo market in which securities are sold temporarily (overnight or very short term) with agreements to repurchase them back.⁵ Just two institutions, JPMorgan Chase and Bank of New York Mellon, operate the back office, custodial and clearing and settlement functions of this market. They often provide significant intra-day credit to other large primary dealers and other large complex financial institutions, borrowing that can amount to as much as \$2 trillion on a given day. These two institutions have a unique informational advantage, especially during times of market stress, which may represent a conflict of interest since they are also active market participants in competition with institutions for which they provide tri-party repo services. Their trading and other activities expose the functioning and their role in the tri-party repo market to exogenous risk, which if realized could cause systemic problems for that market as a whole.

⁵ See Federal Reserve Bank of New York, "Tri-party Repo Infrastructure Reform," White Paper, May 2010 for a discussion of this market and needed reforms. It also contains the Final Report of the Tri-party Repo Infrastructure Reform Task Force. The website is http://www.newyorkfed.org/banking/tpr_infr_reform.html.

Liquidity Risks and a Guide to Policy

An understanding of the key attributes of liquidity and liquidity risks discussed above can guide and shape appropriate public policies for regulation and for managing systemic liquidity risk.

First, it is clear that institutions derive a service from having adequate liquidity; and like other services, that liquidity should carry a price. Failure to internalize the costs of liquidity risk to financial institutions created negative externalities in the form of bail out costs and moral hazard behavior that resulted in large costs (guarantees that have been estimated to equal 25% of world GDP by 2009). These costs have been borne by governments and ultimately by taxpayers.⁶

Second, liquidity risk is affected by the availability and adequacy of information about the value of assets if they are to be regarded as liquid and about the solvency of counterparties.

Third, asymmetric information and, in particular, differential information on asset prices during crises, play a significant role in turning solvency shocks in individual institutions into systemic illiquidity problems.

Fourth, liquidity risk can be affected, both positively and negatively, by market infrastructure (for example, by whether transactions take place on organized exchanges or in over-the-counter markets). For example, the complexity of derivative transactions combined with the lack of information about where the risks would reside in the event of financial distress at a major institution—or the degree of interdependence among institutions that could trigger systematic problems—was a major source of market uncertainty. This uncertainty substantially increased the difficulty of dealing with the current financial crisis and would likely have been greatly reduced if those instruments had been traded on an organized exchange.

Fifth, exchange design and its features can reduce the costs and frequency of illiquidity. That is, liquidity risk can be significantly affected by rules for disclosure and loss-sharing, which, if carefully designed, can create incentives for effective risk management. At the same time, the systematic coordination of disclosure and liquidity supply can help reduce information asymmetries and incentives for market participants to engage in runs, thereby helping to mitigate the consequences of systemic illiquidity shocks.

Sixth, liquidity risks will always exist, but they can be reduced and better managed by effective supervision and well-designed prudential rules for individual institutions. However, to the extent that private parties do not absorb that risk, the FER has concluded that there is an important role to be played by the central bank or other government entities. Unfortunately, improperly designed methods for supplying needed liquidity by central banks can create moral hazard incentives.

⁶ See Alessandri, Piergiorgio and Andrew Haldane, “Banking on the State,” Bank of England, November 2009.

Finally, when it comes to well-designed prudential rules and supervision, the FER suggests that capital ratios and asset liquidity are alternative, but not totally equivalent, means for mitigating liquidity risk. Hence the design of standards for both capital and liquidity must consider their interdependence. This perspective seems to have been lost in the current reform debate.

The above considerations have led the FER to articulate the set of recommendations and principles that were laid out earlier and are discussed in the next section.

Applying Principles: Liquidity Requirements for Financial Institutions

In a world without information asymmetries or taxes, the Modigliani-Miller theorem says that institutions should be indifferent about their capital structure, with debt and equity being perfect substitutes because shareholders could undo capital structure decisions in their own portfolios. This also implies, from our earlier discussion of the relationship between capital and liquidity, that liquidity and capital are also perfect substitutes. But once we recognize the reality of information asymmetries and other market frictions, liquid debt and capital may not be perfect substitutes—and given the clear evidence of the existence of public safety nets for financial institutions that are perceived to be systemically important, it makes sense to regulate both capital structure and liquidity with the aim of limiting taxpayers' exposure to losses. When markets are illiquid or there is uncertainty about the value of the holdings of so-called liquid assets, cash is the most certain and [cut?:more] valuable source of liquidity, including unused debt capacity (the ability to raise funds quickly and efficiently in debt markets).⁷ Cash in the form of deposits at the central bank, currency, and perhaps holdings of riskless government debt are easy to value, observe, and evaluate—and hence they should be the centerpiece of any attempts to regulate liquidity. Requiring private holdings of such cash assets by financial institutions reduces frequency and depth of central bank interventions, and indirectly limits too-big-to-fail or moral hazard. But cash liquidity requirements are not costless, and thus those costs should be considered when limits are established.⁸ Because of the costs of reducing liquidity risks, the FER concluded that central bank backup liquidity services must be kept in place, but should be administered in such a way as to avoid subsidizing economically insolvent firms. In particular, regulators should be prepared to relax liquidity during times of stress, thereby freeing up liquidity capacity to actually be used.⁹ At the same time, regulators also need to recognize that liquidity risk is dependent not only on asset structure or access to debt markets, but is also a function of both leverage and maturity mismatches. Therefore, it is critical that these factors be considered in structuring liquidity and capital requirements.¹⁰

⁷ R.2.

⁸ R.5.

⁹ R.4.

¹⁰ R.3.

Applying Principles: Implementing Tri-party Repo Infrastructure Reforms

The crisis revealed that the current structure of the tri-party repo market, which is one of the largest and most critical markets for liquid assets, is critically flawed when one considers its potential for imposing systemic risks on the financial system. This market is not only important to the efficient operation of liquidity transfers among the world's large complex financial institutions, it is also the major conduit for the conduct of day-to-day Federal Reserve open market operations. It is the main market through which the Primary Dealers interact with each other. And as a consequence of this linkage, a problem in one institution has a high probability of being transmitted to others, and perhaps even to the entire financial system.¹¹ This structure evolved in an *ad hoc* way, largely before the advent of modern technology. Policy makers should place top priority on strengthening the resiliency of the tri-party repo market.

Rather than being an organized exchange, the tri-party market has evolved as a private-sector duopoly run by JPMorgan Chase and Bank of New York. These two institutions are the operational hub of this market and, between them, they are linked to all the world's major financial institutions and extend literally trillions of dollars in daylight over drafts to participating institutions. This market lacks transparency, has virtually no federal regulatory oversight, raises potential issues of conflicts of interest by virtue of the duopoly's unique access to information on counterparty transactions and ability to meet collateral requirements, and poses systemic risks should either of these institutions experience financial distress in their other operations. Their failure would threaten the stability of the world's financial system. If there ever was a question of what firms might be determined too-big-to-fail, the operators of the tri-party repo market fit the bill.

A centralized clearing platform, be it stand alone or government operated, offers clear advantages when it comes to limiting risk transfers from the system operators, reducing systemic risk and controlling liquidity problems over the present OTC model for repos.¹² The present arrangements also suggest the need for contractual reforms that would include specific rules governing automatic substitution of securities and loss-sharing among private sector market participants before public sector support is provided.¹³ The current recourse provisions mean that the failure of a counterparty can have ripple effects across the entire system as transactions are unwound. There also needs to be consideration of changes in the rules governing hypothecation and the treatment of repos in bankruptcy, again to reduce uncertainty about the status of claims of counterparties.¹⁴

Most importantly, there is a need for increased supervision and regulation of the market platforms and better access to information, especially by the Federal Reserve.¹⁵ Day-to-day monitoring would not only help to protect this market, but also provide an important window into the cross-system and counterparty

¹¹ See Duffie, Darrell, "The Failure Mechanics of Dealer Banks," *Journal of Economic Perspectives*, Vol. 24, No.1: 51-72 for a discussion of these problems.

¹² R.8.a.

¹³ R.8.f.

¹⁴ R.8.e. and R.8.h.

¹⁵ R.8.b.

risk exposures and important signals from collateral haircuts and transaction pricing about the health of individual market participants. The authority to expand this oversight is contained in the recently passed Dodd-Frank Wall Street Reform and Consumer Protection Act and the FER urges consideration of several important reforms.

The preferred solution would be to move this market to a separate exchange that is not operated by private sector financial institutions. However, should the present arrangements be continued, then the FER recommends that the duopoly be required to transfer the functions to separately capitalized and operated affiliates or subsidiaries that are capable of continuing operations on a stand-alone basis should either or both of the parents experience financial distress.¹⁶ Furthermore, limits should be placed upon daylight overdrafts to eliminate them altogether or, alternatively, to control and supervise them to ensure that collateral requirements and haircuts are appropriate and that other trading conventions don't subject the market to undue risks.¹⁷ The imposition and enforcement of margin requirements, for example, would be one way of constraining undue risks and reducing the need for daylight overdrafts.¹⁸ While participating institutions might argue that such restrictions are unduly costly, in the view of the FER the social benefits outweigh the private sector costs.

One of the present problems with the current structure of the repo market is that transactions are structured with recourse. This means that should a counterparty fail, there is the risk that many transactions might have to be unwound, which would transfer and pyramid risks. The FER suggests that rules require that repos be structured without recourse to solve the unwinding issues.¹⁹ Finally, transparency of post-trade prices and collateral values should be required and made immediately available to the appropriate regulators and with a brief lag to the public.²⁰ In this way, red flags concerning macro-systemic problems would be readily available and would be a self-enforcing source of market discipline.

Conclusions

This report summarizes the FER's examination of the liquidity issues that arose in the course of the current financial crisis. It suggests principles that can be applied to improve both the regulation and supervision of large complex financial institutions and to reduce systemic risks that might be inherent in some of the world's key financial markets as they are now structured. These principles can be used to evaluate proposed reforms and regulations promulgated to implement them as the U.S. and other nations consider reforms to the financial systems in the wake of the current financial crisis. Finally, we have provided some concrete examples of how the principles might be applied to control financial institution liquidity requirements and to restructure the tri-party repo market.

¹⁶ R.8.a.

¹⁷ R.8.c.

¹⁸ R.8.d.

¹⁹ R.8.g.

²⁰ R.8.i.

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