

Drawing Boundaries Around and Through the Banking System

DARRELL DUFFIE

Stanford University Graduate School of Business

Legislators and regulators are once again grappling with one of the most complex and important policy issues concerning our economic system: How should the boundaries of the regulated banking system be drawn? Should “shadow banks” that offer services tantamount to lending and deposit taking be forced to operate under a banking license? Conversely, should banks that benefit from a safety net of governmental deposit insurance and access to central bank liquidity be allowed to do more than take deposits and make loans?

The United States has had a particularly tortured history with respect to the latter question. US regulators are currently groping for a reasonable implementation of the Volcker Rule, which bans many forms of speculative trading by bank holding companies while allowing them to trade so as to hedge their banking risks and to provide clients with underwriting and market-making services. Some have suggested, instead, a strict return to the Glass-Steagall Act of 1933, under which banks could not offer investment-banking services. The United Kingdom is now drawing fundamental new boundaries *within* its banking system by “ring-fencing” traditional domestic banking services from risks associated with wholesale global financial services. Other major regulatory jurisdictions, particularly Switzerland and the euro zone, have maintained variants of the “universal banking” model, by which banks are permitted to offer a wide range of financial services. In October 2012, however, the Liikanen Group Report recommended to the European Commission that European banks have ring-fencing along lines similar to those of the United Kingdom.

Proponents of tight restriction on the activities of banks assert that limiting banks to traditional lending and deposit taking improves the safety of our financial system. They believe that such limitations need not lead to a loss of market efficiency but, even if it does, we can afford to give up some market liquidity and convenience in order to ensure that our banks are safe.

Bank failures, however, are not the only significant threat to financial stability. Some of the gravest moments of the financial crisis of 2007-2009 involved the bailouts or collapses of large non-bank financial institutions, such as Bear Stearns, Lehman Brothers, Fannie Mae, Freddie Mac, Merrill Lynch, and AIG. Gorton and Metrick detail the additional damage caused by runs on a range of shadow banks, including prime money market mutual funds, asset-backed commercial paper conduits, structured investment vehicles, and other forms of short-term lending backed by collateralized debt obligations.¹ *Shadow banks* are firms that offer close substitutes to

This draft is intended for a publication of the World Economic Forum. The views expressed here are entirely my own. I am grateful for comments from Pierre Collin-Dufresne.

traditional bank lending and deposit taking but are not regulated as banks.² Some hedge funds offer loans, thus participating in the world of shadow banking, but hedge fund failures did not figure prominently in the financial crisis of 2007-2009.

Investment banks and shadow banks have been far less limited than traditional banks by regulatory supervision and capital requirements. They normally have no safety net of deposit insurance or direct access to central bank emergency liquidity.

Banking regulation affects not only the safety and soundness of banks, but also what happens outside the regulated banking system. Our economy depends heavily on the continued provision of certain financial services, whether or not they are offered by regulated banks. The failure of non-bank financial services firms can also cause contagious damage through asset fire sales, heightened investor uncertainty, and counterparty default exposures. In theory, separate systems of regulation for non-bank financial services firms can bring the exterior of the regulated banking system to almost any desired level of safety and soundness. In practice, the recent financial crisis does not leave much comfort in that respect.

What are we trying to protect?

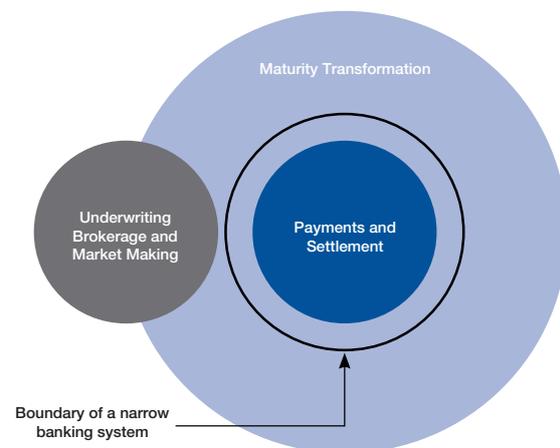
The regulatory boundaries of banking systems are designed mainly to protect within them certain crucial economic functions. Banks operate the economy's most important payment and settlement systems. It would be difficult for a market-based economy to carry out its essential functions if buyers of goods and services were unable to settle their transactions by debiting their bank accounts (or borrowing on bank credit lines) in favor of the bank accounts of sellers. Similarly, a wide range of important financial contracts and securities trades are settled through payment systems operated by banks or bank-controlled clearinghouses. These systems include deposit account and check-clearing systems, credit card account systems, ATM networks, direct bank account transfer systems, interbank large payment systems (such as CHIPS for US dollars and CHAPS for UK pounds), foreign currency transactions settlement services such as CLS Bank, and various securities trade-settlement and depository systems. Some important interbank payment and settlement systems are operated by central banks. The highest priority must be given to the continued operation of these payment and settlement systems.

These payment and settlement systems facilitate the use of *money*, the class of financial instruments by which wealth or access to short-term credit can be safely maintained and widely and easily used as a medium for transactions. The level of economic activity that a market economy can support

depends in part on the stock of money available to facilitate transactions. Bank deposits and short-term bank credit lines are an important source of money. During banking crises, the money supply can drop dangerously unless steps are quickly taken to replenish it. As emphasized by Friedman and Schwartz, the massive failures of US banks in the early 1930s were exceptionally damaging to the US economy because they lowered the stock of money available to the economy, exacerbated by the failure of the central bank to act as a robust lender of last resort.³ By contrast, during the financial crisis of 2007-2009, all major central banks moved aggressively and in a coordinated fashion to ensure that the economy had an abundant stock of money.

In practice, banks offer a substantial credit services beyond those needed to maintain our payment and settlement systems and money stock, especially through *maturity transformation*, by which banks borrow for short maturities and lend for longer maturities. Long-term credit provision is generally risky. Over the term of a 10-year loan, for instance, a borrower whose credit quality is initially strong has plenty of time to become insolvent. Some observers have proposed that our payment and settlement systems and money supply would be better protected within a regime of "narrow banks" that are precluded from significant maturity transformation, as depicted in Figure 1. A related proposal, "100% reserve banking," suggested (and then abandoned) by Milton Friedman, would force each bank's deposits to be 100% backed by reserves (vault currency and central bank deposits), but would allow banks to offer risky long-term loans funded from other sources.⁴

Figure 1: The boundary of a narrow banking system



These sorts of restrictions on banks, however, increase incentives to create money-like financial instruments in the shadow banking system, where they may be less regulated. It would then be left to additional regulation to restrict risks taken by shadow banks (and perhaps to provide a separate

safety net for shadow banks) or, alternatively, to force shadow banking activities back into the regulated banking system. A significant amount of maturity transformation can be (and is) intermediated by hedge funds and other asset management firms, through specialty non-bank finance firms and through the use of security markets, primarily via the issuance of bonds, structured products such as collateralized debt obligations, and mutual funds. If regulations significantly limited maturity transformation by banks, much of the resulting gap could probably be filled adequately outside the regulated banking system, given enough time for adjustment. Most banks are purpose-built for credit intermediation and maturity transformation, however, so this could involve some loss in economic efficiency. In any case, maturity transformation is currently offered liberally within the boundaries of the regulated banking system, where the associated risks are principally addressed with regulatory capital requirements, regulatory supervision, deposit insurance to reduce the risk of runs, and access to emergency loans from the central bank.

In the United States, about 60 percent of credit intermediation occurs in securities markets, rather than through bank loans,⁵ partly explaining the historical tension in the United States over the separation of banks and investment banks. US banks have wanted access to profitable opportunities for intermediating securities and derivatives markets; regulators and investment banks have often resisted. In essentially every other major jurisdiction, securities markets play a much smaller role than banks in credit provision. While the assets of US banks are less than 100 percent of US GDP, this ratio is approximately 300 percent for France and Germany and about 500 percent for the United Kingdom and Switzerland.⁶ The extremely high ratios for the U.K. and Switzerland are due to the fact that their largest banks operate extensively in non-domestic markets.

Even in the United States, the provision and intermediation of credit by banks is substantial and serves an important function beyond contributing to the stock of money and maintaining payment and settlement systems. Providing access to long-term debt financing at a low frictional cost is an important economic service in which banks specialize. Moreover, in the course of arranging access to credit, banks provide substantial governance benefits through the monitoring of borrowers, especially in the case of loans to corporations.⁷

Bundling the robust provision of risky long-term lending together with insured deposit taking is only one of several plausible extensions of the protective safety net of the regulated banking system. If the uninterrupted intermediation of certain securities markets is viewed as critical to the economy, or if their collapse would otherwise endanger the

economy, then regulators could provide some form of safety net for selected securities intermediaries.

For example, Gorton and Metrick argue that certain shadow banks now operating in securities markets should be brought within the protective safety net of the banking system and regulated as narrow banks.⁸ They recommend this step for so-called “stable net asset value” (one dollar per share) money market mutual funds, which are tantamount to demand deposits, and for certain types of securitization vehicles that offer close substitutes for money. Similarly, Ricks proposes that any financial activity that effectively creates money or close substitutes for money should require a license, have its risk taking regulated, and be placed under the protection of deposit insurance and central-bank liquidity support.⁹ In a related proposal, Tuckman suggests that shadow banks of various types should be allowed to submit bids in an auction for access to emergency loans from their central bank.¹⁰

Some analysts believe that shadow banks provide a necessary and relatively safe supply of money. Pozsar makes the case that bank deposits are an unsatisfactory form of money for many large institutional investors, given the risk of bank failure and the limited coverage of deposit insurance.¹¹ Deposit insurance is capped at \$250,000 per account in the United States, and does not exist in many major countries. Based on his analysis of the uses and quantities of various types of money-like instruments, Pozsar suggests that, in preference over bank deposits, institutional investors choose safe and liquid money-like assets that are found in securities markets. These instruments include Treasury bills, of which there is too small a quantity to meet demand, and shadow bank money-like instruments such as money market funds and repurchase agreements. Pozsar writes that institutional investors’ cumulative demand for short-term government-guaranteed instruments (as alternatives to insured deposits) exceeded the supply of such instruments by at least \$1.5 trillion between 2003 and 2008, and that the shadow banking system filled this vacuum through the creation of safe, short-term, liquid instruments.

Dang, Gorton, and Holmstrom caution, however, that reliance on ostensibly safe forms of shadow-bank money can lead to damaging runs by investors once their safety is called into question.¹² Because of this, shadow-banking activities that offer investors access to large amounts of run-susceptible money-like instruments should be either forced back into the regulated banking environment or given a safety net of their own. These approaches are not simple to implement, and could lead to unintended consequences. In particular, safety nets increase moral hazard, a point examined in more detail in the next section. Regulators should be especially alert to

large pools of money-like instruments backed by assets that cannot be given emergency financing at the central bank.

Access to the safety net

Regulated banks benefit substantially from a safety net that, depending on the jurisdiction, can include government-backed deposit insurance, access to loans of last resort from the central bank, and a perception held by many bank creditors that legislatures or central banks would be likely to offer even more assistance if their banking systems were seriously threatened. A particular threat to the banking system is the failure of even a single sufficiently large bank, leading to the infamous phrase “too big to fail.”

The extra assistance offered by governments to regulated banks during the most recent financial crisis, beyond the normal banking safety net, included special bank-specific loan guarantees and capital injections, as well as enormous amounts of secured lending to banks by central banks and other government agencies.¹³ Beyond these steps, all UK bank deposits were given a government guarantee during the crisis. In the United States, banks got extra support from interest payments on their central bank reserve deposits, from a central bank policy of ultra-low short-term interest rates, and from a dramatic extension of government guarantees on loans to banks. The extension of guarantees on US bank debt offered by the Federal Deposit Insurance Corporation through the Temporary Liquidity Guarantee Program covered not only deposit insurance at significantly increased levels, but also other forms of new bank borrowing in almost unlimited amounts. Likewise, in the face of a general bank solvency crisis in late 2011 and early 2012, the European Central Bank offered unprecedented amounts of special three-year financing to euro zone banks.

The US safety net was also extended during the 2007-2009 crisis to many non-bank financial institutions. The insurance giant AIG received government capital injections and secured loans from the Federal Reserve. Two enormous mortgage financing firms, Fannie Mae and Freddie Mac, were nationalized. Emergency secured loans were provided to major non-bank securities dealers through such programs as the Primary Dealer Credit Facility and the Term Securities Lending Facility. When Lehman’s September 2008 bankruptcy triggered a massive run by institutional investors on prime money market mutual funds, these funds were offered a complete guarantee by the US Treasury.¹⁴

These extensions of the safety net beyond the regulated banking system were, however, subjected to heavy scrutiny by many observers, including members of the US Congress, which oversees the Federal Reserve. In the future, these extraordinary forms of support will probably not be viewed by creditors of financial institutions as reliable, compared with the

safety net for regulated banks. Indeed, with the Dodd-Frank Act, Congress removed the ability of the Federal Reserve to provide emergency loans of last resort to individual non-bank institutions. Going forward, non-bank emergency loans from the Fed may be provided only to financial market utilities or under programs that address the needs of a broad set of borrowers. The US Treasury has declared that it is no longer authorized to provide an emergency guarantee to money market mutual funds.

A key benefit to banks of the government safety net is a reduction of their normal cost of debt financing. For example, the treasurer of Goldman Sachs recently estimated that the annual cost to her firm of borrowing with three-year term bank deposits was about 2 percent less than that of issuing three-year bonds.¹⁵

In the United States, it is sometimes said that financial institutions whose risk-taking activities go beyond traditional lending should be denied access to the safety net in order to protect government deposit insurance funds. This logic is backward. Rather, the main purpose of deposit insurance is to lower the risk of interruptions of critical banking services that could be caused by depositor runs. Path-breaking research by Diamond and Dybvig demonstrates that, without deposit insurance, a mere expectation by depositors that other depositors will withdraw their funds earlier than necessary will cause most depositors to attempt to do so, leading to a run and to costly bank failures.¹⁶ Since the introduction of federal deposit insurance in the United States in 1933, the country has experienced none of the broad depositor-based bank runs that had previously plagued its economy. Europe’s leaders are currently considering how to obtain a euro zone-wide deposit insurance scheme in order to mitigate the risk of run-induced failures of their own banks.

A bank run is triggered by solvency concerns that can arise from any source of loss. Empirically, as emphasized by Reinhart and Rogoff, non-performing loans, especially real-estate loans, are the normal cause of banking crises.¹⁷ This is the case even when banking and investment banking have been bundled, as during the financial crises of 1929-1933 and 2007-2009.¹⁸ From the perspective of financial stability, the relevant question is which activities are more dangerously conducted inside the regulated banking system as opposed to outside.

The main cost of extending the safety net to a wider range of activities or firms is the associated moral hazard. If the creditors and managers of a financial institution believe that the institution is likely to receive enough support from the government to prevent its failure, then the financial institution has an incentive to take socially inefficient risks, given the prospect of a bailout and given that failure-causing losses

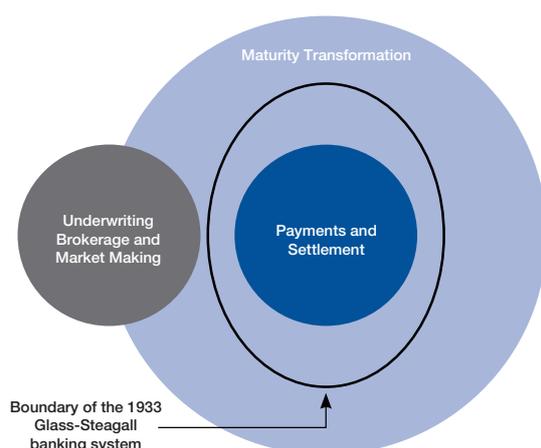
would be borne in part by the safety net provider. For example, Dam and Koetter use pre-crisis German banking industry data to show that significant increases in expectations of bailouts for banks lead to significant increases in risk taking by banks.¹⁹ The more limited the types of risks that are legally permitted by those within the safety net, the less opportunity for moral hazard.

As additional risky activities are permitted within the safety net of the banking system, the associated moral hazard can be mitigated by several approaches, including (i) risk-based capital and liquidity requirements, (ii) risk-based pricing of access to the safety net, and (iii) regulatory supervision. There is, nevertheless, concern that these mitigation tools have often been ineffective. The effectiveness of the first two tools, in particular, depends on accurate risk measurement.²⁰ The difficulty of risk measurement and regulatory supervision grows with the range and complexity of activities bundled within a financial institution.

Ring-fencing, Glass-Steagall, or Volcker?

In the United States, the systemically dangerous practices of most investment banks that were revealed during the financial crisis of 2007-2009 have triggered a new debate over the benefits of a Glass-Steagall-type separation of investment banking from commercial banking. This separation, depicted in Figure 2, was weakened in various regulatory and court decisions during the 1980s and 1990s, and was finally eliminated in 1999 by the Graham-Leach-Bliley Act.²¹

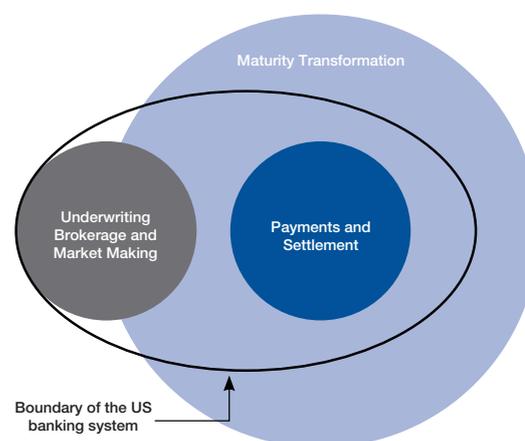
Figure 2: Separation of commercial and investment banking under the Glass-Steagall Act



An outcome of this most recent debate is new legislation commonly known as the Volcker Rule, prohibiting regulated banks and affiliates within the same holding company from financial trading activities other than those necessary for hedging their own risks, making markets, and underwriting new securities offerings. The separation of activities provided

by the Volcker Rule, depicted in Figure 3, is sometimes called “Glass-Steagall light.” The government agencies charged with implementing this legislation have been delayed by the difficulty of clearly defining the exempted trading activities. It is relatively easy to identify some of the types of prohibited trading activities, such as internally operated hedge funds. Indeed, banks and their affiliates have already largely jettisoned these easily identified trading businesses in anticipation of the regulators’ final rules. It has been quite difficult, however, for regulators to define “hedging” and “market making” in an implementable manner that respects the intent of Congress. For example, in many cases it will be difficult for regulators to detect whether a trade was conducted in order to profit from the provision of an intermediation service to a client (market making) or purely in order to benefit from an expected price change.²²

Figure 3: The US banking system under the Volcker Rule



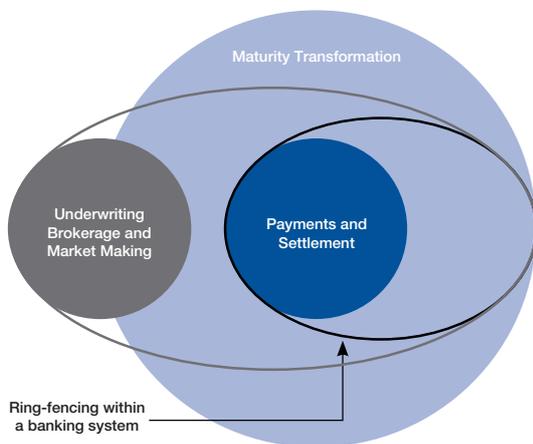
Some of the complaints over the agencies’ initially proposed methods for implementing the Volcker Rule have been over the loss of market liquidity that may result from an unintended but potentially significant reduction in market-making services. For example, Japan, Canada, the United Kingdom, and the European Union have asked the United States to exempt their government bond issues from the Volcker Rule, just as Congress has exempted US government bonds, in order to avoid a loss of liquidity in the markets for their bonds. The less liquid the secondary market for the bonds, the higher must be the interest rate offered by these governments to investors who buy these bonds when they are issued.

If there indeed turns out to be a significant loss of liquidity associated with a reduction in market-making services offered by banks and their affiliates, that gap would probably be filled over time through the entry of market makers that are not affiliated with banks. This, however, raises the specter of the past practices of large investment banks that were outside the regulated banking sphere. Market makers that are not

under the supervision of bank regulators have a different and historically weaker regime of capital requirements than banks and do not have direct access to the safety net. They could, then, pose risks to financial stability. This possibility amplifies the importance of regulatory supervision for systemically important financial institutions (SIFIs) that are not banks. In the United States, the Financial Stability Oversight Council (FSOC), a committee of all major US financial regulatory agencies, will designate and supervise SIFIs. One of the first serious tests of the FSOC's ability to control systemic risk outside the regulated banking system is likely to be over the regulation of money market mutual funds.

The United Kingdom has responded to the dangers to its banking system revealed by the recent crisis with a plan to “ring-fence” its traditional domestic banks from wholesale global banking activities, such as dealings in securities and derivatives.²³ Roughly speaking, this will mean that, whenever these two classes of activities are offered by the same bank, the traditional domestic banking activities (including the critical payment and settlement systems) must be backed by a pool of capital that is legally insulated from losses suffered on wholesale global banking activities, as depicted in Figure 4.

Figure 4: Ring-fencing within the boundary of a universal banking system



As with the Volcker Rule, ring-fencing is easier to describe in general terms than it will be to implement. For example, some domestic commercial banking clients may wish to use derivatives to hedge business risks associated with interest rates, commodities, or foreign exchange. It will be difficult in practice to know when clients are indeed obtaining commercial hedging services or are actually routing demand for speculative positions through the “domestic side” of the bank in order to have a safer counterparty.

In some respects, ring-fencing is less severe than the Volcker Rule, which precludes a significant amount of trading by a bank holding company even when conducted by a broker-dealer affiliate that does not in principle have access to the bank's capital.²⁴ In practice, it is not clear which of these two forms of separation between traditional banking and “wholesale” trading activities will prove to be more effective at maintaining financial stability.

Questions for regulators

Regulators face a complex array of options for how to draw regulatory boundaries around and through their banking systems, and how to promote financial stability outside the boundaries of the banking system.

Nothing about the boundaries of the regulated banking system should be taken on principle. Which activities are allowed within this specially protected regulatory environment is a cost-benefit decision that should be based on how dangerous it would be for these activities to be interrupted, what sorts of collateral damage might be caused by their failure, and what risks these activities would pose to financial stability if conducted outside the regulated banking system. The benefits of access to the safety net are also to be evaluated against the associated moral hazard, which leads to socially inefficient risk taking, to the extent that it cannot be controlled by other regulation.

There can be more than a single monolithic safety net, as with the ring-fencing approach of the United Kingdom. Even more surgical approaches to safety nets include regulated categories of special-purpose narrow banks²⁵ or a market for access to emergency liquidity.²⁶

The regulation of activities by banks clearly influences the activities undertaken in the shadow banking system. The activity limits and safety nets that apply inside and outside the regulated banking environments should be coordinated. Regulatory boundaries should also reflect any clear economies or diseconomies of scope that may add to the costs and benefits of bundling financial services of various sorts within the same enterprise. These economies affect both technical operating costs and customer service quality and efficiency. There are also diseconomies of scope associated with complexity, both for the management of financial institutions and for their regulatory supervision.

After a review of the available evidence, Pennacchi writes, “There appears to be little or no benefits [sic] available from traditional banks that could not be obtained in a carefully designed narrow bank financial system.”²⁷ As to whether there are net efficiency gains associated with extending traditional banks into universal banks, analysts reach mixed or uncertain conclusions.²⁸

Notes

- 1 Gorton and Metrick 2012, 2010.
- 2 See, for example, McCulley 2009. McCulley is the originator of the term *shadow banking*.
- 3 Friedman and Schwartz 1963.
- 4 See Friedman 1960 and Friedman and Schwartz 1986.
- 5 Office of Financial Research 2012, p. 16.
- 6 Her Majesty's Treasury 2012, p. 10.
- 7 See Diamond 1984. The empirical evidence associated with the benefits of governance by universal banks is mixed. See Kroszner and Rajan 1994, Gorton and Schmid 2000, and Ferreira and Matos 2009. On additional benefits through combining underwriting and loan monitoring, see Drucker and Puri 2005.
- 8 Gorton and Metrick 2010.
- 9 Ricks 2012.
- 10 Tuckman 2011.
- 11 Pozsar 2011.
- 12 Dang et al. 2009.
- 13 In the United States, Federal Home Loan Banks provided high levels of "advances" to banks, collateralized by mortgages and other housing-related assets.
- 14 Squam Lake Group, Reforming Money Market Funds: A Proposal by the Squam Lake Group, January 14, 2011, <http://www.squamlakegroup.org/Squam%20Lake%20MMF%20January%2014%20Final.pdf>.
- 15 Harper and Son 2012.
- 16 Diamond and Dybvig 1983.
17. Reinhart and Rogoff 2009.
- 18 See, for example, Markham 2010 and White 2010.
- 19 See Dam and Koetter 2012.
- 20 The price of government deposit insurance has generally been below the market price. See Duffie et al. 2003.
- 21 An excellent review of the history of the Glass-Steagall Act and its elimination is provided in Markham 2010.
- 22 See Duffie 2012.
- 23 See Her Majesty's Treasury 2012, ch. 2.
- 24 Market making and underwriting are exempted by the Volcker Rule but not by ring-fencing. Market making and underwriting, however, are conducted by broker-dealers, not banks. Under Sections 23A and 23B of the US Bank Holding Company Act, transactions between a bank and its broker-dealer and other affiliates within the same holding company must be on an arm's-length basis, must not allow the bank to fund its affiliate beyond strict

limits, and moreover may not involve many of the "wholesale" securities and derivatives products that are ring-fenced in the United Kingdom, except under emergency exemptions that meet stringent conditions and the approval of the Federal Deposit Insurance Corporation. See Omarova 2011. Recently, Bank of America and Morgan Stanley have been prevented by the Federal Reserve from transferring large portfolios of over-the-counter derivatives from their broker-dealer affiliates to their banking arms.

25 See, e.g., the shadow bank examples of Gorton and Metrick 2010 and Ricks 2012.

26 See, e.g., Tuckman 2012.

27 Pennacchi 2012.

28 See Benston 1994, Duffie 2010, Baxter 2012, and Saunders and Walter 2012.

References

- Baxter, L. 2012. "Betting Big: Value, Caution and Accountability in an Era of Large Banks and Complex Finance." *Review of Banking and Financial Law* 31 (in press).
- Benston, G. 1994. "Universal Banking." *Journal of Economic Perspectives* 8(3): 121-43.
- Dam, L. and M. Koetter. 2012. "Bank Bailouts and Moral Hazard: Evidence from Germany." *Review of Financial Studies* 25 (8): 2343-80.
- Dang, T.V., G. Gorton, and B. Holmstrom. 2009. "Opacity and the Optimality of Debt for Liquidity Provision." Work in Progress, available at http://www.econ.yale.edu/~dirkb/teach/pdf/d/dang/Paper_Liquidity.pdf.
- Diamond, D.W. 1984. "Financial Intermediation and Delegated Monitoring." *Review of Economic Studies* 51(3):393-414.
- Diamond, D.W. and P. Dybvig. 1983. "Bank Runs, Deposit Insurance, and Liquidity." *The Journal of Political Economy* 91 (3): 401-19.
- Drucker, S. and M. Puri. 2005. "On the Benefits of Concurrent Lending and Underwriting." *Journal of Finance* 60 (6): 2763-99.
- Duffie, D. 2010. *How Big Banks Fail – And What to do About It*. Princeton, NJ: Princeton University Press.
- . 2012. "Market Making Under the Proposed Volcker Rule." Report to the Securities Industry and Financial Markets Association, submission to the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Securities and Exchange Commission. Available at <http://www.sec.gov/comments/s7-41-11/s74111-72.pdf>.

- Duffie, D., R. Jarrow, A. Purnanandam, and W. Yang. 2003. "Market Pricing of Deposit Insurance." *Journal of Financial Services Research* 24(2-3):93-119.
- Ferreira, M. and P. Matos. 2009. "Universal Banks and Corporate Control – Evidence from the Global Syndicated Loan Market." Working Paper No. 1066. Frankfurt: European Central Bank.
- Friedman, M. 1960. *A Program for Monetary Stability*. New York: Fordham University Press.
- Friedman, M. and A.J. Schwartz. 1986. "Has Government Any Role in Money?" *Journal of Monetary Economics* 17(1): 37-62.
- . 1963. *A Monetary History of the United States, 1857-1960*. Princeton, NJ: Princeton University Press.
- Gorton, G. and A. Metrick. 2010. "Regulating the Shadow Banking System." *Brookings Papers on Economic Activity* 41 (2): 261-97.
- . 2012. "Securitized Banking and the Run on Repo." *Journal of Financial Economics* 104 (3): 425-51.
- Gorton, G. and F. Schmid. 2000. "Universal Banking and the Performance of German Firms." *Journal of Financial Economics* 58 (1-2): 29-80
- Harper, C. and H. Son. 2012. "Breaking up Banks is Hard with Traders Hooked on Deposits." Bloomberg, September 4.
- Liikanen Group. 2012. High-level Expert Group Report on Reforming the Structure of the Banking Sector, Final Report, European Commission, Brussels, October 2, 2012. http://ec.europa.eu/internal_market/bank/docs/high-level_expert_group/report_en.pdf
- Her Majesty's Treasury. 2012. *Banking Reform: Delivering Stability and Supporting a Sustainable Economy*. London: HM Treasury.
- Kroszner, R. and R. Rajan. 1994. "Is the Glass-Steagall Act Justified? A Study of the U.S. Experience with Universal Banking Before 1933." *American Economic Review* 84(4): 810-32.
- Markham, J. 2010. "The Subprime Crisis—A Test Match For the Bankers: Glass-Steagall vs. Gramm-Leach-Bliley." *University of Pennsylvania Journal of Business Law* 12 (4): 1081–134.
- McCulley, P. 2009. "The Shadow Banking System and Hyman Minsky's Economic Journey." *Insights into the Global Financial Crisis*, ed. L. Siegel. The Research Foundation of CFA Institute.
- Office of Financial Research, US Department of the Treasury. 2012. *2012 Annual Report*. Washington DC: OFR.
- Omarova, S.T. 2011. "From Gramm-Leach-Bliley to Dodd-Frank: The Unfulfilled Promise of Section 23A of the Federal Reserve Act." *North Carolina Law Review* 89: 1683-769.
- Pennacchi, G. 2012. "Narrow Banking." *Annual Review of Financial Economics* 4 (in press).
- Pozsar, Z. 2011. "Institutional Cash Pools and the Triffin Dilemma of the U.S. Banking System," *IMF Working Paper* 11/190. Washington DC: IMF.
- Reinhart, C.M. and Rogoff, K.S. 2009. *This Time is Different: Eight Centuries of Financial Folly*. Princeton, NJ: Princeton University Press.
- Ricks, M. 2012. "Reforming the Short-Term Funding Markets." *Harvard University John M. Olin Center for Law, Economics and Business Discussion Paper* No. 713. Available at <http://dx.doi.org/10.2139/ssrn.2062334>.
- Saunders, A. and I. Walter. 2012. "Universal Financial Architecture, Systemic Risk, and Universal Banking." *Financial Markets and Portfolio Management*. 26 (1): 39-59.
- Tuckman, B. 2012. "Federal Liquidity Options: Containing Runs on Deposit- Like Assets without Bailouts and Moral Hazard." *Center for Financial Stability Policy Paper*. New York: Center for Financial Stability.
- White, L. J. 2010. "The Gramm-Leach-Bliley Act of 1999: A Bridge Too Far? Or Not Far Enough?" *Suffolk University Law Review* 43(4): 937-56.