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## The Basel III Liquidity Coverage Ratio and Financial Stability

Andrew W. Hartlage

*University of Michigan Law School*

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## NOTE

# THE BASEL III LIQUIDITY COVERAGE RATIO AND FINANCIAL STABILITY

Andrew W. Hartlage\*

*Banks and other financial institutions may increase the amount of credit available in the financial system by borrowing for short terms and lending for long terms. Though this “maturity transformation” is a useful and productive function of banks, it gives rise to the possibility that even prudently managed banks could fail due to a lack of liquid assets. The financial crisis of 2007–2008 revealed the extent to which the U.S. financial system is exposed to the risk of a system-wide failure from insufficient liquidity. Financial regulators from economies around the world have responded to the crisis by proposing new, internationally uniform bank liquidity standards, augmenting the existing Basel Capital Accord. This Note argues that a major component of these standards, the Liquidity Coverage Ratio requirement, may work to undermine the goals of effective liquidity regulation and instead contribute to issues of systemic risk.*

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## INTRODUCTION

Among the most dramatic and consequential events of the recent financial crisis was the panic in U.S. credit markets in September 2008. Spooked investors, unable to determine the health of financial institutions and fearing the worst after the Lehman Brothers bankruptcy, rushed to withdraw their money and sought refuge in the safest assets, the modern equivalent of hiding cash inside mattresses. A shortage of “liquid” assets—cash and assets readily convertible into cash<sup>1</sup>—precipitated a massive credit contraction that threatened poorly managed and well-managed banks alike with failure. Extraordinary measures by U.S. financial regulators and Congress avoided a systemic collapse, but the crisis propelled the economy into a recession, followed by a period of stagnation from which the country has yet to emerge.

The crisis revealed the extent to which firms at the center of the financial system had relied on short-term borrowing to finance their activities. When managed prudently, the process of taking on short-term debts to finance longer-term loans, such as mortgages, is a useful and productive activity at the heart of the modern financial system; however, this utility comes at a price—banks fail when this short-term funding disappears.<sup>2</sup> Failures at individual firms can spread to envelop the entire financial system through connections between financial institutions and other transmission channels. Effective regulation, then, seeks to balance the salutary effects of longer-term lending with the risks and costs of system-wide failure.

In the aftermath of this crisis, world governments acted to reduce systemic risk in the financial system by strengthening liquidity regulations. In December 2010, the Basel Committee for Banking Supervision—a college of central bankers and other financial regulators from the United States and other advanced economies—proposed new liquidity requirements meant to promote the resilience of the banking sector.<sup>3</sup> This Note examines one of these new requirements: the Liquidity Coverage Ratio (“LCR”), the Basel Committee’s newly proposed minimum threshold for short-term liquidity. The LCR is designed to measure a bank’s resilience over thirty days if faced with a crisis-like situation where some classes of creditors (e.g., other finan-

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1. See BLACK’S LAW DICTIONARY 1015 (9th ed. 2009) (defining “liquidity”).

2. For a fuller discussion of this “maturity transformation” function of banks, see *infra* Section I.A.

3. BASEL COMM. ON BANKING SUPERVISION, BASEL III: INTERNATIONAL FRAMEWORK FOR LIQUIDITY RISK MEASUREMENT, STANDARDS AND MONITORING (2010) [hereinafter BASEL III LIQUIDITY FRAMEWORK], available at <http://www.bis.org/publ/bcbs188.pdf>.

cial institutions) suddenly withdraw from credit markets.<sup>4</sup> The Basel Committee will accept comments on the proposal and announce amendments, if any, by mid-2016 at the latest.<sup>5</sup> The standards will go into effect, with any amendments, by January 1, 2018.<sup>6</sup>

This Note argues that the LCR as proposed may work to undermine the stability of the financial system rather than reduce systemic risk. Part I introduces the concept of maturity transformation, the risks it creates, and the regulatory responses it has provoked. Part II uses a simple model of bank liquidity to demonstrate how certain strategies for complying with the LCR may cause banks to increase borrowing to unsustainable levels, and argues that the LCR will likely push banks to engage in regulatory arbitrage, resulting in reduced financial stability. Finally, Part III reinforces this conclusion by presenting evidence of market distortions brought about by a rule similar to the LCR, which was enacted in the Republic of Korea after its financial crisis in the late 1990s.

### I. LIQUIDITY, BANK PANICS, AND LIQUIDITY REGULATION

Modern societies rely on the financial system to help spread capital efficiently throughout the economy. A modern financial system performs several crucial roles in spreading capital, including transferring resources across time and space, managing risk, clearing and settling payments, pooling resources, and providing information.<sup>7</sup> Banks are key players in the financial system, and they help mitigate the significant informational costs of assessing and monitoring the creditworthiness of borrowers.<sup>8</sup> Another important function of the modern financial system, and one traditionally performed only by commercial banks, is “maturity transformation”<sup>9</sup>—the process by which banks accept short-term debts, such as deposits payable on demand, and use these funds to make longer-term loans to borrowers.<sup>10</sup> Section I.A explains the nature and inherent risks of maturity transformation, and Section I.B describes the regulatory responses to these risks. This discussion frames the detailed analysis of the LCR in Part II.

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4. The LCR is discussed in detail *infra* in Section II.A.

5. BASEL III LIQUIDITY FRAMEWORK, *supra* note 3, paras. 9, 197.

6. *Id.* para. 9.

7. Robert C. Merton & Zvi Bodie, *A Conceptual Framework for Analyzing the Financial Environment*, in DWIGHT B. CRANE ET AL., *THE GLOBAL FINANCIAL SYSTEM* 3, 12–15 (1995).

8. See Hayne E. Leland & David H. Pyle, *Informational Asymmetries, Financial Structure, and Financial Intermediation*, 32 J. FIN. 371, 382–84 (1977) (arguing that financial intermediaries—lenders who make and hold loans—are a solution to the problem of extracting value from specialized information on borrowers).

9. See Douglas W. Diamond & Philip H. Dybvig, *Banking Theory, Deposit Insurance, and Bank Regulation*, 59 J. BUS. 55, 62 (1986) (“This transformation service is the most subtle and probably the most important function of banks.”).

10. Jeffrey D. Sachs, *Alternative Approaches to Financial Crises in Emerging Markets*, in CAPITAL FLOWS AND FINANCIAL CRISES 247, 250 (Miles Kahler ed., 1998).

### A. Maturity Transformation and Financial Instability

The following example illustrates the maturity transformation process: A bank accepts \$1,000 in demand deposits from each of 1,000 depositors. By the terms of the contracts between each depositor and the bank, a demand-deposit holder has the right to withdraw his or her funds "on demand"—that is, at any time. These deposits appear on the bank's balance sheet as a \$1 million liability: the demand-deposit contract sets up a creditor-debtor relationship between the bank and the depositor, with the bank as debtor and the depositor as creditor. Depositors withdraw and add money to their deposit accounts as they save and consume. In this way, the \$1 million liability on the bank's balance sheet fluctuates over time.

However, if the depositors' additions to and withdrawals from the accounts are random, there forms within the demand deposits a portion of funds that is statistically stable.<sup>11</sup> Returning to the example in the previous paragraph, assume the bank has determined that \$800,000 of the \$1 million deposit is stable. The bank then makes \$800,000 in mortgage loans to individuals and keeps the remainder of the money as cash in its vaults or securities that are readily convertible into cash, such as U.S. government debt. The mortgage borrowers agree to pay back principal and interest over thirty years. The bank uses the cash and liquid securities to satisfy day-to-day customer withdrawal requests. The bank's common stockholders invest cash in the amount of \$32,000 to absorb losses from bad mortgage loans. This amount appears on the bank's balance sheet as \$32,000 in shareholders' equity. The balance sheet of the example bank is given below:

TABLE 1  
EXAMPLE BANK BALANCE SHEET

Assets	Liabilities and Shareholder's Equity
Cash and Liquid Securities = \$232,000	Demand Deposits = \$1,000,000
Thirty-Year Mortgages = \$800,000	Common Stock = \$32,000
Total = \$1,032,000	Total = \$1,032,000

Through this process, the bank has transformed short-term obligations (demand deposits) into long-term obligations (thirty-year mortgages). This insight—that in normal times, stability emerges from the random, independent interactions of a large collection of depositors—forms the basis for the maturity transformation process.

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11. Douglas W. Diamond & Philip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. POL. ECON. 401, 404 (1983).

This process accrues benefits not only for the bank but also for the economy. The bank earns interest income equal to the interest collected from borrowers minus the interest paid to depositors. Provided that long-term interest rates are higher than short-term interest rates,<sup>12</sup> banks profit from maturity transformation by charging borrowers an interest rate keyed to higher long-term rates while paying interest at a rate keyed to lower short-term rates. But banks are not the only beneficiaries of maturity transformation: long-term borrowers benefit through an increased supply of long-term loans, and thus the improved affordability of long-term asset financing. For example, in the case of residential homebuyers, who must decide between leasing or purchasing a home, longer-term loans can help lower monthly mortgage payments and thus make home ownership more attractive vis-à-vis home rental.<sup>13</sup> Moreover, banks' comparative expertise in determining and monitoring creditworthiness<sup>14</sup> implies that borrowers for whom determining creditworthiness is expensive (e.g., individuals) have few alternatives to bank credit. To the extent that banks can offer longer-term loans, this does much to increase the supply of long-term financing to such borrowers.

However, maturity transformation also exposes banks to liquidity risk. As mentioned above, the maturity-transformation process depends on the probabilistic stability of short-term debt. If the assumptions regarding depositor stability fail to hold, banks risk defaulting on their debt due to a lack of available cash to satisfy withdrawals. Scholars refer to this type of sudden demand by the depositors of a single bank as a "run."<sup>15</sup> Returning to the example bank discussed above, if 500 of the bank's depositors simultaneously lost confidence in the bank and suddenly withdrew their funds, totaling \$500,000, the bank could satisfy only \$232,000 of this demand with its cash and liquid securities. Moreover, it could not easily turn its thirty-year mortgage loans into cash.<sup>16</sup> It could attempt to borrow more money, but it would

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12. This assumption holds under normal economic conditions, but a number of theories compete to explain this phenomenon. A fuller explanation is beyond the scope of this Note, but for more analysis on the theories of interest rates, see J.R. HICKS, *VALUE AND CAPITAL* 144–47 (2d ed. 1946) (explaining longer-term interest rates as reflective of expectations regarding future short-term rates), and JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT INTEREST AND MONEY* 165–74 (1936) (theorizing that interest rates are in part determined by investors' willingness to forego liquidity).

13. The thirty-year mortgage helped contribute to the post–World War II home-ownership boom. See Albert Chevan, *The Growth of Home Ownership: 1940–1980*, 26 *DEMOGRAPHY* 249, 249–50 (1989).

14. See generally Douglas W. Diamond, *Financial Intermediation and Delegated Monitoring*, 51 *REV. ECON. STUD.* 393 (1984).

15. E.g., Gary Gorton & Andrew Winton, *Financial Intermediation*, in 1A *HANDBOOK OF THE ECONOMICS OF FINANCE: CORPORATE FINANCE* 431, 495–96 (George M. Constantinides et al. eds., 2003).

16. The large information asymmetries in loans create the potential for adverse selection problems, making the outright-sale market for mortgages akin to a market for "lemons." See generally George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 *Q.J. ECON.* 488, 489–91 (1970). One would therefore expect loans to

likely incur difficulties in the face of depositors' general lack of confidence. Thus, this sudden withdrawal could lead the bank to default on its obligations and, in the worst case scenario, to fail.

Runs can quickly become "panics"—system-wide demands on banks—and ultimately adversely affect the real economy. Depositors might run on their bank without specific concerns about that bank's health: they could be fearful generally of banks due to macroeconomic conditions<sup>17</sup> or they could run on the bank irrationally.<sup>18</sup> Once some depositors begin to withdraw funds, the remaining depositors could rush to withdraw as well, before the limited resources available to the bank to satisfy creditors are depleted.<sup>19</sup> Credit would become scarce, scuttling long-term asset purchases such as real estate.<sup>20</sup> Historically, financial crises usually precede significant declines in economic output and employment.<sup>21</sup>

The ineluctable two-sided nature of maturity transformation has real consequences for policymakers. Regulators cannot hope to eliminate the possibility of bank runs or systemic panics without discarding the benefits of maturity transformation.<sup>22</sup> Thus, regulations mitigating liquidity risk must balance the risks of excessive maturity mismatch and the potential for runs against the impact of reduced credit and depressed bank performance on economic growth. The following Section reviews the approaches of regulators around the world to liquidity regulation.

### B. Regulatory Responses to Liquidity Risk

No international consensus exists on the "right" way to regulate liquidity at financial firms. The following Sections survey the varying approaches to liquidity regulations employed by countries around the world.<sup>23</sup> Section

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trade at a significant discount, even under normal conditions; if banks must sell assets quickly, these discounts would deepen, making this an even more punitive deleveraging strategy. See generally Andrei Shleifer & Robert Vishny, *Fire Sales in Finance and Macroeconomics*, J. ECON. PERSP., Winter 2011, at 29, 30 (describing financial fire sales in general).

17. See Gorton & Winton, *supra* note 15, at 505 (reviewing the literature on information-based theories of banking panics).

18. See Diamond & Dybvig, *supra* note 11, at 404 (noting that runs "could depend on almost anything").

19. See *id.* at 403.

20. See *supra* note 15 and accompanying text.

21. CARMEN M. REINHART & KENNETH S. ROGOFF, *THIS TIME IS DIFFERENT* 224 (2009). Professors Reinhart and Rogoff's survey of financial crises in advanced countries from 1815 to 2007 reveals that, on average, banking crises result in a 7 percent increase in unemployment trough to peak, and a 9.3 percent drop in real per-capita GDP peak to trough. *Id.* at 229 fig.14.3, 230 fig.14.4.

22. DANIEL K. TARULLO, *BANKING ON BASEL* 28 (2008); see also Diamond & Dybvig, *supra* note 11, at 409 ("A demand deposit contract which is not subject to runs provides no liquidity services.").

23. This Note reviews only positive requirements with respect to liquidity meant to prevent failure. This excludes those public mechanisms meant to support ailing firms in crisis, such as Federal Deposit Insurance Corporation ("FDIC") receivership, deposit insurance

I.B.1 describes the United States' process-oriented approach, and analyzes recent developments regarding large banks and systemically significant nonbanks. Section I.B.2 discusses how European Union ("EU") requirements for domestic liquidity regulation are patterned after the U.S. approach, and describes recent shifts by some member states toward "harder" numerical requirements. Section I.B.3 reviews the work of the Basel Committee on Banking Supervision to harmonize liquidity regulation across international borders. By imposing a uniform international standard, the Basel III liquidity risk management provisions will impose order on a currently fragmented system, but doing so requires the introduction of new types of liquidity requirements on firms in countries important to the global economy, such as the United States.

### 1. Liquidity Regulation in the United States

U.S. banking regulators seek to control liquidity risk by inspecting the processes of liquidity-risk management at regulated firms using what this Note calls a "qualitative" approach.<sup>24</sup> Rather than set minimum levels of cash and liquid securities as a portion of liabilities, safety-and-soundness regulators consider management of liquidity risk to be part of prudent bank-management practice; government examiners use supervisory audits to evaluate firms' internal liquidity risk management processes,<sup>25</sup> looking for oversight of liquidity-risk tolerances by the bank's board of directors, sufficient management information systems to track liquidity risk, the establishment and periodic adjustment of risk limits, and the development of a liquidity contingency plan.<sup>26</sup> Deficient liquidity-risk management could invite supervisory action, including a cease-and-desist order.<sup>27</sup> Also, in principle, a bank's performance in liquidity-risk management could affect its

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schemes, and discount-window lending, as well as emergency lending to nonbanks under section 13(3) of the Federal Reserve Act, 12 U.S.C. § 343 (2006 & Supp. V 2011). For an analysis of these mechanisms, see Andrew W. Hartlage, Note, *Europe's Failure to Prepare for the Next Financial Crisis Affects Us All*, 44 GEO. J. INT'L L. (forthcoming 2013).

24. By contrast, this Note defines a "quantitative" requirement as a rule that mandates a certain numerical level of cash and liquid securities, usually expressed as a ratio over a portion of the bank's liabilities. The LCR is a quantitative requirement. See *infra* Section II.A for a detailed explanation of the LCR.

25. As of 2010, all four major safety-and-soundness regulators (the FDIC, the Board of Governors of the Federal Reserve System, the Office of the Comptroller of the Currency, and the now-abolished Office of Thrift Supervision) had incorporated liquidity-risk management elements into their supervisory guidelines. See Interagency Policy Statement on Funding and Liquidity Risk Management, 75 Fed. Reg. 13,656, 13,660 & n.8 (Mar. 22, 2010) (collecting citations).

26. See, e.g., OFFICE OF THE COMPTROLLER OF THE CURRENCY, COMPTROLLER'S HANDBOOK: LIQUIDITY 27–44 (2001), available at [http://www.occ.treas.gov/publications/publications-by-type/comptrollers-handbook/\\_pdf/liquidity.pdf](http://www.occ.treas.gov/publications/publications-by-type/comptrollers-handbook/_pdf/liquidity.pdf).

27. See, e.g., 12 U.S.C. § 1818(b)–(c) (2006 & Supp. V 2011) (granting the FDIC the power to issue cease-and-desist orders to banks under its direct supervision and, in limited circumstances, to institutions regulated by other regulators).



composite CAMELS rating,<sup>28</sup> which in part determines the amount of deposit-insurance premiums paid by a financial firm.<sup>29</sup> However, as the liquidity component is one component among six that determine a firm's composite CAMELS rating,<sup>30</sup> which itself is one of many factors used to compute deposit-insurance assessment rates,<sup>31</sup> any effect of liquidity-risk-management audit findings on deposit assessment rates is highly attenuated.

Since the economic crisis, Congress has acted to strengthen liquidity regulations for large, systemically significant financial companies. The Board of Governors of the Federal Reserve System must promulgate more stringent liquidity regulations for large bank holding companies and systemically important nonbank financial firms than that which is applicable to other firms,<sup>32</sup> and the Financial Stability Oversight Council has the authority to recommend that the Board promulgate more stringent liquidity regulation.<sup>33</sup> Per this grant of authority by Congress, the Board has proposed more concrete liquidity-risk management regulations;<sup>34</sup> however, the new rules generally leave discretion with financial-firm boards and senior executives on important liquidity-management decisions,<sup>35</sup> the amounts of cash and liquid securities held,<sup>36</sup> and sources of assumed liabilities.<sup>37</sup>

## 2. Liquidity Regulation in the European Union and Its Member States

The precrisis approach of EU member states to liquidity-risk regulation closely tracked that of the United States. The Capital Requirements Directive ("CRD")<sup>38</sup> forms the fundamental EU-wide regulatory framework

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28. Federal banking regulators use a uniform rating system for financial institutions commonly known as CAMELS, an acronym for the phrase Capital adequacy-Asset quality-Management-Earnings-Liquidity-Sensitivity to market. *See* Uniform Financial Institutions Rating System, 61 Fed. Reg. 67,021, 67,022, 67,025 (Dec. 19, 1996).

29. *See* 12 C.F.R. § 327.9 (2012).

30. Uniform Financial Institutions Rating System, 61 Fed. Reg. at 67,025.

31. CAMELS ratings can appear as part of the FDIC's assessments under 12 C.F.R. § 327.9(a)–(c), or as one of seven factors used to calculate the initial base-assessment rates for the least risky banks per *id.* § 327.9(d).

32. 12 U.S.C. § 5365(a)(1)(A), (b)(1)(A)(ii) (Supp. V 2011).

33. *Id.* § 5325(a)(1)(A), (b)(1)(C).

34. *See* Regulation YY, 77 Fed. Reg. 594, 645–49 (proposed Jan. 5, 2012) (to be codified at 12 C.F.R. pt. 252).

35. *See, e.g., id.* at 646–47 (imposing responsibilities on boards and board committees for liquidity-risk management, including overseeing "liquidity risk management processes"; establishing policies, strategies, and contingency plans; and reviewing management assumptions on the firm's liquidity position).

36. *See id.* at 648.

37. *See id.*

38. *See generally* Directive 2006/48/EC, of the European Parliament and of the Council of 14 June 2006 Relating to the Taking Up and Pursuit of the Business of Credit Institutions (Recast), 2006 O.J. (L 177) 1 [hereinafter Capital Requirements Directive].

for banking,<sup>39</sup> the CRD adopts a qualitative approach to liquidity-risk management, requiring banks to establish appropriate management procedures and contingency plans.<sup>40</sup> As a result, quantitative liquidity regulations that form part of the Basel III proposal will be new for most of Europe.<sup>41</sup>

However, some EU member states have already shifted to a quantitative approach. The CRD, as a directive of the European Union, is not directly applicable in EU countries and must be enacted through legislation in each member state.<sup>42</sup> This allows for some variation in operational details from state to state. Going beyond the CRD's requirements, Germany promulgated a quantitative liquidity ratio in December 2006.<sup>43</sup> Germany's regulation requires banks and securities firms to maintain sufficient cash and other assets readily convertible into cash to satisfy maturing liabilities within the next one-month period.<sup>44</sup> Banks must also calculate "observation ratios" that measure the assets available to cover maturing liabilities over the next three-, six-, and twelve-month periods.<sup>45</sup> The United Kingdom updated its liquidity regulation applicable to banks in September 2009,<sup>46</sup> adopting a split approach: general qualitative standards concerning a firm's liquidity-risk management processes apply to firms by default,<sup>47</sup> while some firms with uncomplicated balance sheets may choose to comply instead with a quantitative liquidity rule.<sup>48</sup>

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39. Georgina Peters, *Developments in the EU, in* CROSS-BORDER BANK INSOLVENCY 128, 129–30 (Rosa M. Lastra ed., 2011).

40. See Capital Requirements Directive, *supra* note 38, Annex V ¶¶ 14–15, 2006 O.J. (L 177) at 80 ("Policies and processes for the measurement and management of [credit institutions'] net funding position and requirements on an ongoing and forward-looking basis shall exist. Alternative scenarios shall be considered and the assumptions underpinning decisions concerning the net funding position shall be reviewed regularly.").

41. See, e.g., Derek Paine, Compliance Manager, J.P. Morgan & Henrik Lang, Liquidity Product Sales Specialist, J.P. Morgan, Liquidity Regulation in the UK & Europe: Impact on International Banks and Broker-Dealers 8 (July 7, 2010), available at [http://www.jpmorgan.com/cm/BlobServer/Liquidity\\_Regulation\\_in\\_UK\\_and\\_Europe.pdf?blobkey=id&blobnocache=true&blobwhere=1320537297240&blobheader=application%2Fpdf&blobcol=urldata&blobtable=MungoBlobs](http://www.jpmorgan.com/cm/BlobServer/Liquidity_Regulation_in_UK_and_Europe.pdf?blobkey=id&blobnocache=true&blobwhere=1320537297240&blobheader=application%2Fpdf&blobcol=urldata&blobtable=MungoBlobs).

42. See Consolidated Version of the Treaty on the Functioning of the European Union art. 288, Mar. 30, 2010, 2010 O.J. (C 83) 47, 172 ("A directive shall be binding, as to the result to be achieved, upon each Member State to which it is addressed, but shall leave to the national authorities the choice of form and methods.").

43. See Liquiditätsverordnung [LiqV] [Liquidity Regulation], Dec. 14, 2006, BUNDESGESETZBLATT, Teil I [BGBL. I] at 3117, § 2 (Ger.).

44. *Id.* § 2(1).

45. *Id.* § 2(2).

46. Prudential Sourcebook for Banks, Building Societies and Investment Firms (Liquidity) Instrument 2009, FSA 2009/55 (U.K.).

47. *Id.* arts. 12.3–12.5.

48. *Id.* art. 12.6.

### 3. International Coordination on Liquidity Regulation

The Basel III Liquidity Coverage Ratio is part of the first concrete international agreement on liquidity to issue from the Basel Committee on Banking Supervision. First established in 1974,<sup>49</sup> the Basel Committee works to foster “regular cooperation on banking supervisory matters.”<sup>50</sup> Representatives from twenty-seven jurisdictions<sup>51</sup> work to harmonize capital adequacy and other requirements through the Basel process.<sup>52</sup> Recommendations made by the Basel Committee are not binding on nations, and must be enacted into law in each jurisdiction; countries have no obligation with the force of law to follow the Basel Committee’s recommendations.<sup>53</sup> Though the Committee is known for its work on capital adequacy standards,<sup>54</sup> in September 2008 it released a final set of *Principles for Sound Liquidity Risk Management and Supervision*<sup>55</sup> and included the LCR in its Basel III capital adequacy proposal in December 2010.<sup>56</sup>

\* \* \*

Regulators have begun to modify their approach to liquidity regulation in the aftermath of the recent financial crisis. The LCR and similar quantitative liquidity requirements will, for many countries including the United States, represent a break from the past. The next Part discusses the extent of this break and concludes that significant potential exists for market distortions that could work to undermine financial stability.

## II. EVALUATING THE BASEL III LIQUIDITY COVERAGE RATIO

In response to the liquidity problems encountered in the recent financial crisis, the Basel Committee on Banking Supervision released a preliminary proposal for new liquidity requirements in December 2010.<sup>57</sup> Among the new regulations proposed by the Basel Committee is a requirement to meet a minimum threshold for short-term liquidity as measured by the LCR. Sec-

49. *History of the Basel Committee and Its Membership*, BASEL COMM. ON BANKING SUPERVISION, 1 (Aug. 2009), <http://www.bis.org/bcbs/history.pdf>.

50. *About the Basel Committee*, BANK FOR INT’L SETTLEMENTS, <http://www.bis.org/bcbs/about.htm> (last visited Aug. 29, 2012).

51. Not all members of the Basel Committee are states. For example, the Committee’s membership includes the Hong Kong Special Administrative Region. *Id.*

52. *Id.*

53. See, e.g., Michael S. Barr & Geoffrey P. Miller, *Global Administrative Law: The View from Basel*, 17 EUR. J. INT’L L. 15, 23 (2006) (U.K.) (“[T]he Basel process . . . results only in non-binding standards to be implemented at the national level . . .”).

54. *About the Basel Committee*, *supra* note 50.

55. BASEL COMM. ON BANKING SUPERVISION, *PRINCIPLES FOR SOUND LIQUIDITY RISK MANAGEMENT AND SUPERVISION* (2008), available at <http://www.bis.org/publ/bcbs144.pdf>.

56. BASEL III LIQUIDITY FRAMEWORK, *supra* note 3.

57. *Id.*

tion II.A provides a detailed overview of the LCR requirement. Section II.B explores the implications of the requirement using a simple model of bank liquidity, and shows how the rule may lead to costly, even unsustainable, borrowing cycles. Section II.C considers potential responses to the LCR, and argues that bank managers are likely to choose a regulatory arbitrage strategy of compliance that may, in the aggregate, undermine financial stability.

#### A. The Basel III Liquidity Coverage Ratio Proposal Defined

The LCR seeks to improve the short-term resilience of financial firms by requiring that firms be sufficiently liquid to survive a thirty-day scenario of severe credit-market stress.<sup>58</sup> Under the LCR, firms would be required to keep “high-quality liquid assets” (“HQLA”)<sup>59</sup> equal to at least 100 percent of “total net cash outflows”<sup>60</sup> over the next thirty calendar days.<sup>61</sup> Expressed as an equation, the LCR takes the following form<sup>62</sup>:

$$\text{Liquidity Coverage Ratio} = \frac{\text{high-quality liquid assets}}{\text{total net cash outflows over 30 days}} \geq 100\%$$

Firms would report compliance with the LCR on at least a monthly basis, with more frequent reporting possibly being required in cases of increased stress.<sup>63</sup>

Two categories of assets make up HQLA. The first category, Level 1 assets, includes cash and other assets that may be easily converted to cash in a stressed situation (for example, statutory reserves and high-quality sovereign debt such as U.S. Treasuries).<sup>64</sup> The full current market value of Level 1 assets is applied to HQLA.<sup>65</sup> The second category, Level 2 assets, includes assets that will likely fetch nearly full value in a stressed situation, such as low-risk corporate bonds, covered bonds,<sup>66</sup> and some securities issued by

58. *Id.* para. 4.

59. For more detail regarding the definition of HQLA, see *infra* notes 64–71 and accompanying text.

60. For more on the computation of total net cash outflows, see *infra* notes 72–73 and accompanying text.

61. BASEL III LIQUIDITY FRAMEWORK, *supra* note 3, para. 15.

62. *Id.* para. 16.

63. *Id.* para. 186.

64. See *id.* para. 40.

65. *Id.* para. 39.

66. Covered bonds are bonds issued by a financial institution that are secured by a pool of assets, such as residential mortgages, held on the financial institution’s balance sheet. U.S. DEP’T OF THE TREASURY, BEST PRACTICES FOR RESIDENTIAL COVERED BONDS 7 (2008),

sovereigns, central banks, and similar entities.<sup>67</sup> Eighty-five percent of the current market value of Level 2 assets is applied to HQLA,<sup>68</sup> and Level 2 assets may make up no more than 40 percent of the total HQLA amount.<sup>69</sup> Assets that do not come under Levels 1 or 2 cannot be included in HQLA.<sup>70</sup> In all cases, any asset that is counted in HQLA must not be encumbered by any third-party security interest or kept as a hedge, and must be held on the firm's own account (that is, customer-held securities cannot be included).<sup>71</sup>

"Total net cash outflows" is defined as the sum of outflows over the next thirty days minus the lesser of inflows and 75% of outflows.<sup>72</sup> Thus, total net cash outflows will be either the firm's projected thirty-day outflows minus its projected thirty-day inflows or 25% of its projected thirty-day outflows, whichever is greater. This definition of total net cash outflows limits the degree to which firms may rely on inflows to cover outflows because in no event will the rule's definition of total net cash outflows be less than 25% of the firm's projected outflows.<sup>73</sup> The liquidity ratio thus forces a firm to hold liquid assets equal to at least 25% of the dollar volume of its projected outflows.

A bank's most obvious and easy-to-predict outflows are its principal obligations on borrowings that will mature during the applicable window. Its inflows consist of the interest it earns on loans and the principal payments made during the applicable window.<sup>74</sup> But more exotic forms of inflows and outflows exist: for example, unused lines of credit can cause outflows if borrowers choose to draw down,<sup>75</sup> and derivatives contracts may give rise to known receivables, which would count as inflow.<sup>76</sup>

The LCR adjusts both inflows and outflows to simulate severe liquidity stress. For outflows, the rule assigns minimum runoff rates by type of liability, with these rates increasing as funding instability increases.<sup>77</sup> For example, for deposits that are owned by natural persons and fully covered by a deposit insurance scheme (historically, a stable source of funding), regulators may assume that as little as 5% of these funds will leave the bank in

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available at <http://www.treasury.gov/about/organizational-structure/offices/General-Counsel/Documents/USCoveredBondBestPractices.pdf>. The U.S. market for these instruments is still small—as of July 2008, only two U.S. depository institutions had issued covered bonds. See *id.* at 5.

67. BASEL III LIQUIDITY FRAMEWORK, *supra* note 3, paras. 41–42.

68. See *id.* para. 42 (imposing a 15 percent "haircut").

69. *Id.* para. 41.

70. See *id.* para. 35.

71. See *id.* paras. 26–28.

72. *Id.* para. 50.

73. *Id.*

74. E.g., *id.* paras. 105, 112–114 (including cash inflows from "fully performing" loans).

75. See *id.* paras. 93–97.

76. *Id.* para. 117.

77. See *id.* paras. 54–87.

a stress scenario.<sup>78</sup> However, for the type of bank borrowing that proved to be highly unstable during recent financial crises, such as unsecured lending from other financial institutions, regulators must assume that 75 to 100% of these funds will be unavailable in a crisis.<sup>79</sup> For inflows, the rule assumes that in a crisis situation, banks will refuse to roll over loans made to other financial institutions, and thus they will have available 100% of inflows to satisfy depositors; as for other customers such as retail borrowers, the rule assumes that half of all inflows will be lent back to customers as rollovers, leaving 50% of gross inflows available to satisfy the LCR.<sup>80</sup>

The LCR also accounts for outflows that are not captured on the balance sheet. Firms must include in net outflows 100% of the amount of collateral or any other cash outflows that would result from a credit downgrade, up to and including a three-notch downgrade.<sup>81</sup> Firms also must include additional outflows to reflect the falling value of collateral in a fire sale.<sup>82</sup> In addition, firms must assume that counterparties will draw on outstanding credit and liquidity facilities, with runoff rates ranging from 5% (in the case of retail and small business customers) to 100% (in the case of, for example, financial institutions).<sup>83</sup>

In sum, the LCR is structured to differentiate between volatile funding sources, such as wholesale funding, and less volatile sources such as retail deposits. However, the mechanics of the rule and the wide discrepancy between the treatment of wholesale and retail deposits could instead undermine the stability of banks.

### B. The Mechanics of the Liquidity Coverage Ratio

Though the LCR is meant to make firms more resilient and less likely to fail or require rescue from the government during a financial crisis, this Note argues that the rule may lead to broad market distortions in the markets for wholesale funding,<sup>84</sup> retail deposits, and bank capital. This is due to what this Section calls the “snowballing” borrowing requirements of the LCR, where firms that engage in maturity transformation borrow (and only borrow) to satisfy the LCR and face ever-growing borrowing requirements. To demonstrate this snowballing effect, this Section constructs simple examples to show how although the LCR does foreclose some funding strategies that breed systemic risk through interconnectedness (as the Basel Committee

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78. *See id.* para. 56.

79. *See id.* paras. 81–83.

80. *See id.* paras. 112–114.

81. *Id.* para. 89. This provision is largely meant to address the liquidity stresses like those that led to the bailout of American International Group (“AIG”). *See generally* FIN. CRISIS INQUIRY COMM’N, THE FINANCIAL CRISIS INQUIRY REPORT 344–47 (2011) (attributing AIG’s liquidity problems in part to downgrade-triggered collateral obligations).

82. *See* BASEL III LIQUIDITY FRAMEWORK, *supra* note 3, para. 90.

83. *See id.* paras. 93–97.

84. That is, debt issued to nonretail creditors.

intended), the LCR also penalizes firms that pursue common competitive strategies in retail banking, strategies that do not implicate systemic risk issues. Section II.B.1 discusses the endlessly increasing borrowing requirements for banks that rely exclusively on wholesale funding. Section II.B.2 shows how even a choice to borrow from historically stable funding sources is “taxed” by the requirement that firms hold a cushion of HQLA in preparation for severe market conditions.

### 1. Wholesale Funding and “Snowballing” Borrowing

*Example 1.* To begin with an extreme example, imagine a bank with \$100 in assets on the first day of Year Zero that will mature on the first day of Year Thirty. No payments are required before maturity. This bank funds these long-term assets with \$100 in unsecured borrowing from financial institutions that mature on the first day of Year One. The bank’s regulator requires banks to meet the LCR as measured on the first day of each year. Assume that the bank has no right to terminate its funding agreement (or prepay) before the maturity date. The bank also keeps \$8 in common stock and \$8 in HQLA. We will assume that the bank will fund any increase in assets solely with wholesale funding from financial institutions, and that this new funding will mature at the next period. The bank’s balance sheet on the first day of Year Zero is given as follows:

TABLE 2  
EXAMPLE 1: BALANCE SHEET AT YEAR ZERO

Assets	Liabilities and Shareholder's Equity
High-Quality Liquid Assets = \$8	Wholesale Funding = \$100
Long-Term Loans = \$100	Common Stock = \$8
Total = \$108	Total = \$108

In the final thirty days of Year Zero, just before the wholesale funding matures at the beginning of Year One, all \$100 of wholesale funding would count as outflows under the LCR because the rule defines outflows to include 100 percent of wholesale liabilities maturing in the next thirty days.<sup>85</sup> As we have assumed that no payments are due on the loans, there are no inflows to offset the outflows, making net outflows equal to \$100; thus, to satisfy the ratio, the bank must hold \$100 in HQLA. As the bank has only \$8 in such assets, the bank must raise \$92 in additional funding to meet the standard. The bank also rolls over its \$100 in maturing funding to fund its loans. Thus, the bank has a balance sheet at the beginning of Year One as follows:

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85. See BASEL III LIQUIDITY FRAMEWORK, *supra* note 3, para. 82.

TABLE 3  
EXAMPLE 1 BALANCE SHEET AT YEAR ONE

Assets	Liabilities and Shareholder's Equity
High-Quality Liquid Assets = \$100	Maturing Wholesale Funding = \$100
	New Wholesale Funding = \$92
Long-Term Loans = \$100	Common Stock = \$8
Total = \$200	Total = \$200

Once year one has begun, the bank is flush with liquidity because the bank has no outflows until the beginning of Year Two. However, due to the bank's one-term borrowing fixed-funding strategy, it cannot discharge its obligations early once made.<sup>86</sup>

In the final thirty days of Year One, just before the beginning of Year Two, all \$192 of the wholesale funding again counts as outflows under the LCR. The bank has only \$100 in HQLA, and again borrows \$92 in the market to cover the shortfall. Thus, at the beginning of Year Two, the bank's balance sheet will have swelled:

TABLE 4  
EXAMPLE 1 BALANCE SHEET AT YEAR TWO

Assets	Liabilities and Shareholder's Equity
High-Quality Liquid Assets = \$192	Maturing Wholesale Funding = \$192
	New Wholesale Funding = \$92
Long-Term Loans = \$100	Common Stock = \$8
Total = \$292	Total = \$292

Further iterations of this funding strategy create ever-increasing, or "snowballing," funding needs when liabilities mature and are replaced with other liabilities of a similar duration. If the bank is unable to raise this amount of money in the market, the firm will be unable to satisfy the LCR. What the LCR fails to reveal, however, is that the bank is still likely to be liquid, as the incremental borrowing is needed only to build excess HQLA stock for LCR ratio purposes.

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86. If the bank in our example could prepay its debt, it could use its excess HQLA (because the bank need not report its ratio to the regulator until the beginning of the next year) to repay its creditors and shrink its balance sheet. However, few banks have the flexibility to prepay their depositors or other creditors, and I assume here that they do not.



Though the snowballing effect leads to runaway borrowing when firms rely solely on wholesale funding, reliance on more stable funding sources also gives rise to more modest snowballing under the LCR. Consider the following example.

## 2. Other Funding Sources and Liquidity “Gross-Ups”

*Example 2.* Assume a bank on the first day of Year Zero with \$100 in long-term assets that will mature on the first day of Year Thirty, and that no payments are required before maturity. This bank funds these long-term assets with \$100 in retail time deposits<sup>87</sup> that mature on the first day of Year One.<sup>88</sup> The bank also keeps \$8 in common stock and \$8 in HQLA. As before, the bank’s regulator requires it to meet the LCR as measured on the first day of each year. We will assume that the bank will fund any increase in assets solely with additional retail time deposits, and that this new funding will mature at the next period. The bank’s balance sheet on the first day of Year Zero would look like this:

TABLE 5  
EXAMPLE 2 BALANCE SHEET AT YEAR ZERO

Assets	Liabilities and Shareholder's Equity
High-Quality Liquid Assets = \$8	Retail Time Deposits = \$100
Long-Term Loans = \$100	Common Stock = \$8
Total = \$108	Total = \$108

Because the LCR requires banks to count at least 10 percent of maturing retail time deposits as “total net cash outflows,”<sup>89</sup> in the thirty days before the time deposits mature on the first day of Year One, at least \$10 would count as net outflows under the LCR. As we have again assumed that no payments are due on the loans, the bank must hold \$10 in HQLA. As before, the bank borrows the \$2 difference as retail time deposits, and rolls over the \$100 in maturing funding. The bank would now have \$102 in retail-time-deposit funding on the first day of Year One:

87. A time deposit is “[a] bank deposit that is to remain for a specified period or for which notice must be given to the bank before withdrawal.” BLACK’S LAW DICTIONARY 504 (9th ed. 2009).

88. As with the previous example, the bank will have no right to terminate or prepay this borrowing before maturity.

89. See BASEL III LIQUIDITY FRAMEWORK, *supra* note 3, paras. 57–64.

TABLE 6  
EXAMPLE 2 BALANCE SHEET AT YEAR ONE

Assets	Liabilities and Shareholder's Equity
High-Quality Liquid Assets = \$10	Retail Time Deposits = \$102
Long-Term Loans = \$100	Common Stock = \$8
Total = \$110	Total = \$110

The new borrowing required to satisfy the ratio tapers off after the first day of Year One, and with further iterations, the HQLA holdings arrive at a steady-state level, forming a “liquidity cushion.” After fifteen iterations, the balance sheet would look like this:

TABLE 7  
EXAMPLE 2 BALANCE SHEET AT YEAR FIFTEEN

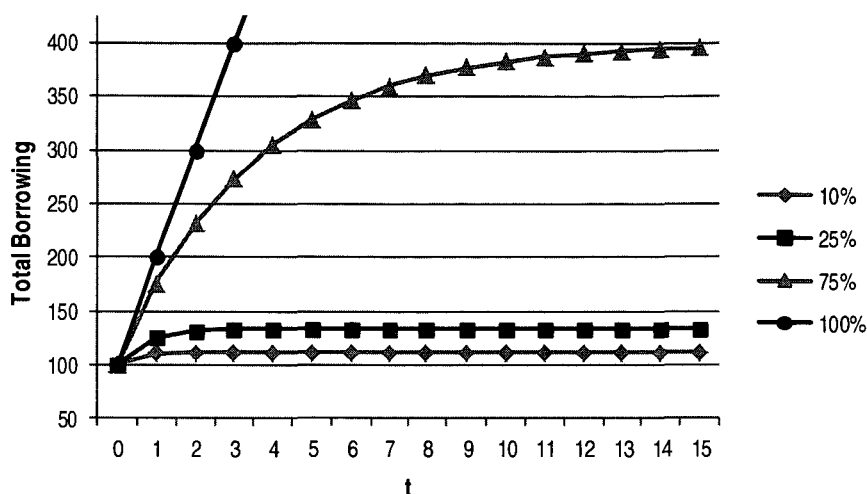
Assets	Liabilities and Shareholder's Equity
High-Quality Liquid Assets = \$ 10.22	Retail Time Deposits = \$102.22
Long-Term Loans = \$100	Common Stock = \$8
Total = \$110.22	Total = \$110.22

Unlike Example 1, for funding with runoff rates of less than 100 percent, the rule does not create endlessly snowballing lending but creates steady-state borrowing cushions that build up over time. The following figure shows the cushion sizes for each minimum LCR runoff rate<sup>90</sup>:

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90. Another way to think of these steady-state amounts is as the “gross-up” rates that would allow banks to meet the LCR without having to return to the market for more funding. These gross-up rates in practice would depend on other factors such as the loan’s amortization schedules.

FIGURE 1  
BORROWING AMOUNTS BY LCR RUNOFF RATE<sup>91</sup>



This example shows more clearly the disparity in treatment between unsecured whole funding and retail, small-business, or public funding. Institutions that rely too heavily on wholesale funding in any form will have much greater liquidity needs.

The LCR operates as an effective “tax” on the liabilities of banks in the form of higher funding requirements for debt borrowed at short terms and debt that has shown instability in past crises. We would expect such taxes to provoke a response from banks as they develop a strategically optimal way to comply with the rule. Some of these strategic responses are discussed in the next Section.

### C. Responses to the Rule

The LCR does not prescribe how firms are to comply with its requirements. A straightforward way to comply with the rule would be to acquire HQLA in the amounts required to satisfy the rule. This is the same strategy employed by the banks in the examples above in Section II.B. However, this strategy would likely require banks to raise large amounts of new funding,<sup>92</sup>

91. To better demonstrate the steady-state cushion values, Figure 1 assumes that the firms have no cash on hand at  $t = 0$ . It can be shown that, given the conditions assumed above, for  $t \geq 2$  the curves conform to the general equation:

$$f(t+1) - f(t) = \lambda \cdot (f(t) - f(t-1))$$

where  $\lambda \geq 2$  and is the value of the LCR runoff rate. It then follows that  $\lim_{t \rightarrow \infty} f(t)$  converges for  $0 \leq \lambda < 1$ , and does not for  $\lambda \geq 1$ .

92. See, e.g., PHILIPP HÄRLE ET AL., MCKINSEY & CO., *BASEL III AND EUROPEAN BANKING 3 ex.1* (2010) (forecasting that U.S. banks must add the equivalent of 570 billion euros in short-term funding and 2.2 trillion euros in long-term funding to comply with the Basel III liquidity requirements).

and some predict that in certain jurisdictions there may not be enough HQLA for all banks to satisfy the rule.<sup>93</sup> Thus, one might expect banks to adjust their capital structures to comply with the rule at the least cost to them.<sup>94</sup>

Companies have three “degrees of freedom” when changing their capital structures to comply with the rule: first, banks may “deleverage,” or choose to fund with equity rather than debt; second, banks may pursue a “mismatch reduction” strategy by increasing the average maturity of their borrowing (i.e., begin borrowing for longer terms); and third, banks may engage in “regulatory arbitrage” by changing the sources of their borrowing from higher-taxed to lower-taxed sources of funding. Companies may choose one or a combination of the above strategies when adjusting their capital structures to comply with the LCR.

Though it is difficult to predict which strategy companies are likely to choose, each strategy has a different set of associated costs and benefits, and different barriers to implementation. The following Sections discuss these response strategies in turn: Section II.C.1 discusses the deleveraging option and concludes that few banks would be expected under classical theories of bank capital structure to increase equity levels voluntarily to insure against illiquidity. Section II.C.2 evaluates the mismatch-reduction option and concludes that few banks would have the flexibility in borrowing terms to adopt such a strategy. Section II.C.3 analyzes the regulatory-arbitrage option and argues that many banks are likely to choose this strategy and compete with one another for the retail demand deposits that receive favorable treatment under the LCR. I argue that this third strategy, though likely the most attractive of the above alternatives for a typically situated bank acting alone, leads to aggregate consequences that may undermine systemic financial stability.

### 1. Option One: Deleveraging

One strategy to satisfy the LCR’s snowballing borrowing requirements is to reduce leverage—that is, fund the business not with debt but with common stock and other equity instruments that do not mature. This strategy works because, as a residual claim on the value of the firm, common equity never matures, and would never form a part of “net outflows” under the

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93. See, e.g., AUSTL. PRUDENTIAL REGULATION AUTH., IMPLEMENTING BASEL III LIQUIDITY REFORMS IN AUSTRALIA 8 (2011), available at [http://www.apra.gov.au/adi/Documents/ADI\\_DP\\_IBLR\\_November\\_2011.pdf](http://www.apra.gov.au/adi/Documents/ADI_DP_IBLR_November_2011.pdf) (“As is well recognised, the supply of [high-quality liquid assets] in Australia is insufficient to meet the Australian dollar liquidity requirements of [institutions covered by the LCR].”).

94. Banks could also decide to comply with the rule by increasing short-term non-readily-marketable assets, such as credit-card receivables. Because contractual inflows from fully performing outstanding exposures reduce net cash outflows, see BASEL III LIQUIDITY FRAMEWORK, *supra* note 3, para. 105, this strategy reduces the size of the ratio’s denominator, thereby increasing the quotient and improving the bank’s ratio. However, this strategy would adjust a bank’s portfolio of assets and thus the bank’s credit risks. The strategy’s success would therefore depend on market particulars. A discussion of this strategy is beyond the scope of this Note.

LCR.<sup>95</sup> Some scholars have called for firms to hold capital against the risk of illiquidity,<sup>96</sup> in effect forcing firms to adopt this manner of substitution.

This kind of substitution would bring about an immediate and direct improvement to the resilience of the financial system. More capital gives firms a larger buffer to absorb losses due to eroding asset values. Increased capital also lowers leverage, and excessive leverage among investment banks and government-sponsored enterprises worsened the crisis in the United States.<sup>97</sup>

However, few banks would be expected under the classical theories of bank capital structure to increase equity levels voluntarily to insure against illiquidity. First, banks are thought to prefer to fund their activities with debt rather than equity. One explanation for this preference arises from “pecking order” theory, which posits that the informational asymmetries between managers of a firm and external investors drive managers to choose internal financing over debt, and debt over equity.<sup>98</sup> Another key reason is deposit insurance, which shifts some of the costs of bank failure from depositors to the deposit insurance fund.<sup>99</sup> If regulators did not shift the costs of deposit insurance back to banks, these banks would enjoy a subsidy for debt financing. Evidence from the recent crisis suggests that U.S. deposit insurance was underpriced, at least during the decade before the crisis.<sup>100</sup> Increasing equity may lower return on equity in the short term, a key measure of corporate performance, or may be unacceptable to current shareholders who are unwilling to dilute their holdings.

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95. See *supra* text accompanying note 48.

96. See, e.g., MARKUS BRUNNERMEIER ET AL., *THE FUNDAMENTAL PRINCIPLES OF FINANCIAL REGULATION* 45–48 (Geneva Reports on the World Econ. No. 11, 2009).

97. FIN. CRISIS INQUIRY COMM’N, *supra* note 81, at xix to xx.

98. RICHARD A. BREALEY & STEWART C. MYERS, *PRINCIPLES OF CORPORATE FINANCE* 524–27 (7th ed. 2003).

99. See, e.g., Robert C. Merton, *An Analytic Derivation of the Cost of Deposit Insurance and Loan Guarantees: An Application of Modern Option Pricing Theory*, 1 J. BANKING & FIN. 3 (1977) (framing deposit insurance as a put option on a bank’s liabilities, and using the Black-Scholes option pricing formula to analyze the value of that option to a bank). Nearly all countries have some form of deposit insurance. See Asli Demirgüç-Kunt et al., *Deposit Insurance Around the World: A Comprehensive Database*, in *DEPOSIT INSURANCE AROUND THE WORLD* 363, 364 (Asli Demirgüç-Kunt et al. eds., 2008) (identifying 181 countries with either an explicit or implicit deposit insurance scheme).

100. The most compelling evidence of underpriced deposit insurance is the failure of the Deposit Insurance Fund to satisfy all benefit claims arising from the failures of insured institutions. The Fund showed a negative balance from the third quarter of 2009 to the second quarter of 2011. See *Quarterly Banking Profile: Second Quarter 2011*, 5 FDIC Q. (Fed. Deposit Ins. Corp., Washington, D.C.), no. 3, 2011, at 1, 17 tbl.I-B. A factor that likely contributed to this shortfall was statutory requirements that capped the size of the fund and prohibited the FDIC from collecting deposit insurance premiums from the lowest risk banks once the fund reached the size limit. Viral V. Acharya et al., *Systemic Risk and Deposit Insurance Premiums*, FRBNY ECON. POL’Y REV. (Fed. Reserve Bank of N.Y.C.), Aug. 2010, at 89, 91. As a result, the FDIC did not collect premiums from the majority of banks from 1996 to 2006. *Id.*

## 2. Option Two: Mismatch Reduction

Banks may also comply with the LCR through “mismatch reduction,” or increasing the length of borrowing terms from existing sources of funding.<sup>101</sup> This strategy works because longer-term borrowing would mature in the LCR’s thirty-day window less often than shorter-term debt, and the “snowballing” borrowing described above<sup>102</sup> would occur more gradually, giving banks more time to arrange for more stable funding sources. Extending the borrowing periods would also allow banks to enjoy more inflow deductions from net outflows, thus lowering net outflows and dampening the effects of the rule.

Financial stability would likely improve if banks were to shift their capital structures in this way. Some of the most egregious failures of the recent financial crisis were those of firms that funded long-term illiquid assets with short-term, highly volatile debt—a prominent example is Northern Rock, a thrift-like financial institution in the United Kingdom, whose failure was accelerated by its reliance on wholesale funding.<sup>103</sup>

However, many banks would be unable to adopt this strategy. Most importantly, banks likely have little flexibility to extend the terms of borrowing from their existing creditors. Banks funded in large part with wholesale liabilities—the institutions that suffer the largest penalties under the LCR and would be under the greatest pressure to revamp their capital structure—are among the least likely to succeed in increasing average borrowing terms, because most financial institutions that lend surplus funds to other banks are themselves vulnerable to liquidity stresses or runs. Lender banks would rationally seek to operate such funds at short terms so that they could be used as a buffer during a crisis. As for banks funded mainly through retail deposits, these banks would also struggle to increase borrowing terms because demand deposits and time deposits are not substitutes for one another: consumers hold demand deposits in large part to access payment systems, which would no longer be possible if funds were instead held in longer-term time deposits.

Also, such a strategy would cause bank profitability to suffer due to increased interest expense. In a normal interest rate environment, borrowing long term is more expensive than borrowing short term.<sup>104</sup> An increase in funding cost would lower the bank’s net interest margin, operating profit, and return on capital. Thus, bank executives would likely be reluctant to adopt such a strategy as a first choice.

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101. This Section assumes that banks borrow from the same sources. For a discussion of the effects of a shift among funding sources, see *infra* Section II.C.3.

102. See *supra* Section II.B.

103. See NAT’L AUDIT OFFICE, HM TREASURY: THE NATIONALISATION OF NORTHERN ROCK, 2008-9, H.C. 298, at 13-14 (U.K.), available at [http://www.nao.org.uk/publications/0809/northern\\_rock.aspx](http://www.nao.org.uk/publications/0809/northern_rock.aspx) (click on “Full Report” link); Hyun Song Shin, *Reflections on Northern Rock: The Bank Run that Heralded the Global Financial Crisis*, J. ECON. PERSP., Winter 2009, at 101, 107-10.

104. See *supra* note 12 and accompanying text.

### 3. Option Three: Regulatory Arbitrage

A third way to comply with the LCR is through regulatory arbitrage: shifting borrowing from sources with unfavorable treatment under the rule, such as wholesale funding, to sources with favorable treatment, such as retail deposits. This would lower the applicable runoff ratio with respect to those maturing liabilities, thereby reducing net cash outflows, and increasing the ratio given a fixed level of HQLA.

Banks may find that this alternative is the most attractive among those discussed here. First, increasing retail deposits, especially non-interest-bearing demand deposits, may increase bank profitability by lowering the bank's average cost of funds. Also, attracting new depositors to banks gives an opportunity to sell other banking products, such as loans or transaction services, to more customers and thereby increase income.

Moreover, such a strategy does not necessarily require expensive investments in systems, staff, and real estate; banks could compete on price instead. The "direct" banking model is an example of a low-capital-expenditure, price-led business strategy targeting retail depositors.<sup>105</sup> One well-known adherent to the direct banking strategy was the Icelandic bank Landsbanki, which rapidly built a deposit book through its U.K. branch under the "Icesave" name.<sup>106</sup> Another well-known example is ING Bank fsb, or "ING Direct," which held \$82 billion in deposits as of June 30, 2011, making it the fifteenth-largest insured depository institution in the United States despite its very small branch network.<sup>107</sup> In many ways, direct banks offer a product similar to that of money market mutual funds ("MMFs"), whereby customers trade a modicum of transactional convenience for higher returns.<sup>108</sup>

Though such a strategy may make sense at the individual-firm level, a shift in this direction has strong negative implications for overall financial

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105. For an explanation of the direct banking model, see Brian A. Johnson et al., *Banking on Multimedia*, MCKINSEY Q., no. 2, 1995, at 94 (describing the "multimedia bank").

106. See Mark J. Flannery, *Iceland's Failed Banks: A Post-Mortem*, in 9 RANNSÓKNARNEFND ALÞINGIS [SPECIAL INVESTIGATION COMM'N], AÐDRAGANDI OG ORSAKIR FALLS ÍSLENSKU BANKANNA 2008 OG TENGDIR ATBURÐIR [BACKGROUND AND CAUSES OF THE COLLAPSE OF ICELANDIC BANKS IN 2008 AND RELATED EVENTS] app. 3 at 89, 100 & fig.6 (2009) (Ice.), available at <http://www.rannsoknarnefnd.is/pdf/RNABindi9.pdf> (stating that Landsbanki's U.K. branch raised over 4 billion pounds sterling in deposits after only one year of operations).

107. *Top 50 Commercial Banks and Savings Institutions by Total Domestic Deposits*, FED. DEPOSIT INS. CORP., <http://www2.fdic.gov/sod/index.asp> (follow "Summary Tables" hyperlink; then follow "Top 50 Commercial Banks and Savings Institutions by Total Domestic Deposits" hyperlink) (data as of June 30, 2011). ING Direct has only one deposit-taking office. *Id.*

108. MMF investors also forfeit deposit insurance protection. See PRESIDENT'S WORKING GRP. ON FIN. MKTS., MONEY MARKET FUND REFORM OPTIONS 8 (2010) ("[M]any retail customers likely consider MMF shares and bank deposits [to be] near substitutes, even if the two classes of products are fundamentally different (most notably because MMF shares are not insured and because MMFs and banks are subject to very different regulatory regimes).").

stability. The favorable treatment of retail deposits is justified on the basis of the stability of such deposits, even in times of extreme financial stress. Though ordinarily retail deposits are stable in a crisis, this may not hold true for retail depositors who are underinsured—that is, who have deposits in excess of the deposit insurance coverage limits. These large-volume depositors are those with the greatest incentives to move to higher-yielding savings products, and to flee to safer products in times of crisis.

Evidence from the 2007–2008 financial crisis supports the idea that these “hot” retail deposits do not exhibit the stability normally attributed to retail deposits. Underinsured depositors were primarily responsible for the withdrawal of \$9.4 billion from Seattle-based thrift Washington Mutual (“WaMu”) during a two-week period in July 2008.<sup>109</sup> A second run in September 2008 led the Office of Thrift Supervision, WaMu’s primary federal regulator, to place WaMu into Federal Deposit Insurance Corporation (“FDIC”) receivership.<sup>110</sup> From June 30 to September 25, 2008, WaMu lost \$13.6 billion in retail deposits,<sup>111</sup> in large part due to a loss of depositor confidence.<sup>112</sup> U.S. MMFs—for which no investor insurance scheme existed—also suffered runs in September 2008, and the U.S. Department of the Treasury and the Board of Governors of the Federal Reserve System were forced to make “unprecedented . . . interventions”<sup>113</sup> to stabilize the market,<sup>114</sup> including a blanket guarantee.<sup>115</sup> In the United Kingdom, Landsbanki’s Icesave suffered a debilitating bank run in September 2008 due to concerns that Iceland’s deposit insurance fund could not satisfy depositor claims in the case of the bank’s failure.<sup>116</sup> In view of this track

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109. Kirsten Grind, *The Downfall of Washington Mutual*, PUGET SOUND BUS. J., Sept. 28, 2009, <http://www.bizjournals.com/seattle/stories/2009/09/28/story1.html?page=all> (“[M]ost of the money withdrawn during the July bank run lacked FDIC coverage, because it exceeded the \$100,000 limit at the time.”).

110. *Id.*; see also OFFICES OF INSPECTOR GEN., DEP’T OF THE TREASURY, FED. DEPOSIT INS. CORP., REP. NO. EVAL-10-002, EVALUATION OF FEDERAL REGULATORY OVERSIGHT OF WASHINGTON MUTUAL BANK 13 (2010) [hereinafter REGULATORY OVERSIGHT OF WASHINGTON MUTUAL], available at <http://www.fdicog.gov/reports10/10-002EV.pdf>.

111. As of June 30, 2008, WaMu held \$148.3 billion in retail deposits. Wash. Mut., Inc., Quarterly Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Quarterly Period Ended June 30, 2008 (Form 10-Q), at 54 (Aug. 11, 2008). By September 25, 2008, this amount had dropped to \$134.7 billion. REGULATORY OVERSIGHT OF WASHINGTON MUTUAL, *supra* note 110, at 62.

112. See Grind, *supra* note 109 (“WaMu’s deposit team and liquidity managers watched as billions flew out of the bank, from all areas of the country. They estimated that the FDIC insurance covered more than half of the money that fled. It didn’t matter. Like the Great Depression, customers acted purely out of fear.”).

113. PRESIDENT’S WORKING GRP. ON FIN. MKTS., *supra* note 108, at 12.

114. See FIN. CRISIS INQUIRY COMM’N, *supra* note 81, at 358–59; PRESIDENT’S WORKING GRP. ON FIN. MKTS., *supra* note 108, at 11–13.

115. See Press Release, U.S. Dep’t of the Treasury, Treasury Announces Guaranty Program for Money Market Funds (Sept. 19, 2008), available at <http://www.treasury.gov/press-center/press-releases/Pages/hp1147.aspx>.

116. Flannery, *supra* note 106, at 106.



record, it is unclear why these “less stable” retail deposits, particularly deposits belonging to underinsured depositors, should receive treatment under the rule that is significantly more favorable than that of wholesale funding.

Moreover, if competition for retail deposits increases, prices could rise to a level where customers are more sensitive to changes in price, undermining stability.<sup>117</sup> Though bank customers in the United States and other countries appear to choose banks primarily on the basis of factors other than price, such as convenience,<sup>118</sup> it is unclear what would happen if retail banking markets were disrupted by a bank with an aggressive price strategy. The successes of MMFs, ING Direct, and Landsbanki in attracting some segments of retail depositors indicate that some depositors will respond to increased prices. A permanent environment of increased prices could cause a similar increase in customer price sensitivity, thus leading to an irreparable deterioration in the stability of retail deposits.

Some may argue that, despite the possibility of runs at a few high-risk banks like WaMu, deposit insurance has made the probability of a system-wide panic in the traditional banking system highly remote. Congress has increased the insured amounts under the federal deposit insurance scheme,<sup>119</sup> and should even these higher insurance levels fail to stop a market-wide run, the U.S. government has shown that it is willing to extend unlimited guarantees when threatened with a panic.<sup>120</sup> Clearly such guarantees are effective at stopping market-wide panics once in motion. But ex post interventions treat the symptoms of financial instability and ignore the disease. Effective ex ante regulation is an important component of a suite of actions to prevent and deal with financial crises,<sup>121</sup> and its weaknesses should not be rationalized by the existence of bailouts.

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In the preceding Part, the mechanics of the LCR were explored using a simple model of bank liquidity. Though the model makes several simplifying assumptions and explores only a single-minded strategy of HQLA increases to meet the rule’s requirements, it demonstrates the

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117. In other words, the LCR’s effect on the supply curve could move the equilibrium price for retail deposits to a region on the demand curve where demand is more price elastic.

118. See Charles Blankson et al., *Determinants of Bank Selection in USA, Taiwan and Ghana*, 25 INT’L J. BANK MARKETING 469, 480 tbl.V (2007).

119. See Dodd–Frank Wall Street Reform and Consumer Protection (Dodd–Frank) Act, Pub. L. No. 111-203, § 335, 124 Stat. 1376, 1540 (2010) (amending Federal Deposit Insurance Act § 11(a)(1)(E), 12 U.S.C. § 1821(a)(1)(E) (2006 & Supp. V 2011)).

120. See, e.g., 12 C.F.R. § 370.4 (2011) (guaranteeing in full all non-interest-bearing transaction accounts); see also *supra* text accompanying note 115 (money market mutual funds).

121. See Sachs, *supra* note 10, at 261 (“[T]he governing principle for emergency international support should be a combination of ex ante prudential standards to avoid moral hazard . . . [and] timely lending to avert or stem a panic . . .”).

disparate treatment of wholesale and retail funding under the LCR. Alternative strategies for complying with the LCR by adjusting capital structure were discussed, and the costs and benefits of these options for both individual firms and market stability (as informed by prevailing economic theory) were evaluated. In view of the above calculus, this Part argued that bank managers may be tempted to choose the regulatory-arbitrage strategy as the least punitive and most growth-oriented of the strategies available; however, a market-wide shift to adopt this strategy may erode the stability of the deposits, undermining the very reason that retail deposits enjoy preferential treatment under the LCR.

### III. CASE STUDY: REPUBLIC OF KOREA

The preceding Part argued that the LCR as proposed could increase competition for retail deposits and other deposits with favorable treatment under the rule, which could undermine the stability of these deposits and increase the risk in the financial system. The analysis relied largely on insights from neoclassical economic theory. This Part supplements this theoretical investigation with some empirical evidence; in particular, this Part discusses the response by banks in the Republic of Korea to liquidity regulations promulgated in the wake of the Asian financial crisis of the late 1990s.<sup>122</sup> Section III.A argues that the lessons from Korea's crisis and its subsequent financial reforms are highly relevant to today's international financial reform efforts due to the fundamental similarity between the Korean and U.S. financial crises. Section III.B describes Korea's postcrisis reforms with respect to liquidity regulation, showing that overly prescriptive liquidity regulation of a type similar to that of the LCR was responsible for market distortions, eventually leading regulators to relax the regulations.

#### A. Comparing the Korean and U.S. Financial Crises

The Republic of Korea suffered through a debilitating economic period as part of the larger Asian financial crisis of the late 1990s. The Korean economy developed quickly in the four decades after the Korean War through a close relationship between the government and industry, especially the *jaebeol*, or large commercial conglomerates.<sup>123</sup> However, the country's rapid growth obscured fundamental weaknesses in loan underwriting that allowed overinvestment in some industrial sectors.<sup>124</sup> This led

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122. For an overview of the Republic of Korea's modern economic development and the late-1990s financial crisis, see TERENCE C. HALLIDAY & BRUCE G. CARRUTHERS, *BANKRUPT: GLOBAL LAWMAKING AND SYSTEMIC FINANCIAL CRISIS* 212–15 (2009).

123. Yoon Je Cho, *The Financial Crisis in Korea: Causes and Challenges*, in 7 *RIISING TO THE CHALLENGE IN ASIA: A STUDY OF FINANCIAL MARKETS* 1, 3 (Asian Dev. Bank 1999).

124. See *id.* at 5; see also Letter from Kyung-shik Lee, Governor, Bank of Korea, and Chang-Yuel Lim, Deputy Prime Minister and Minister of Fin. & Econ., Republic of Korea, to Michel Camdessus, Managing Dir., Int'l Monetary Fund, at attachment para. 4 (Dec. 3, 1997).

to a string of large corporate bankruptcies, saddling the financial sector with large portfolios of nonperforming loans.<sup>125</sup> Korean bank regulation had been lax,<sup>126</sup> and Korean banks were vulnerable due to risks from maturity transformation (borrowing short-term to lend long-term) and currency mismatch (borrowing in one currency to lend in another).<sup>127</sup> The Thai currency crisis created regional scarcity in short-term borrowing, eventually compelling Korea to apply for assistance from the International Monetary Fund.<sup>128</sup>

Though the Korean and U.S. financial crises appear superficially very different, a closer inspection shows that the two arose from similar causes, unfolded through similar sequences of events, and led to convergent regulatory structures. Due to these similarities, the lessons of Korea's postcrisis path to reform are readily applicable to the international process of liquidity-regulation reform prompted by the 2007–2008 financial crisis.

Though each crisis was the result of a complex interconnection of causes,<sup>129</sup> a close look at the Korean and U.S. financial crises reveals several important shared attributes. Korean and U.S. financial institutions were saddled with solvency issues in the years immediately preceding each crisis: in Korea's case, these issues arose from nonperforming commercial loans to *jaebeol*;<sup>130</sup> similarly, in the United States, poorly underwritten residential mortgage assets infected the financial system.<sup>131</sup> Also, in each case, these underlying solvency problems were in part masked by strong economic performance and asset bubbles.<sup>132</sup> Firms in

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[hereinafter Letter of Intent], available at <http://www.imf.org/external/np/loi/120397.htm> (describing the role of highly leveraged corporate bankruptcies in financial sector failures).

125. Letter of Intent, *supra* note 124, at attachment para. 4.

126. *Id.* at attachment para. 5.

127. See SIMON JOHNSON & JAMES KWAK, 13 BANKERS: THE WALL STREET TAKEOVER AND THE NEXT FINANCIAL MELTDOWN 42–43 (2010).

128. *Id.* at 43–45.

129. BYUNG-TAE KIM, KOREA'S BANKING LAW REFORM: POST ASIAN CRISIS 16 (2003) (“[M]ultiple factors combined and interconnected under Korea's specific banking circumstance.”); see FIN. CRISIS INQUIRY COMM'N, *supra* note 81, at xvii to xxv (giving several conclusions on factors contributing to the 2007–2008 U.S. financial crisis).

130. Joon-Ho Hahm & Frederic S. Mishkin, *The Korean Financial Crisis: An Asymmetric Information Perspective*, 1 EMERGING MARKETS REV. 21, 35 tbl.6 (2000) (quantifying the dramatic increase in “latent” nonperforming loans on large Korean-bank balance sheets from 1995 to 1998).

131. FIN. CRISIS INQUIRY COMM'N, *supra* note 81, at 256 (noting that large mortgage losses “strained [large financial institutions'] capital and cash reserves”).

132. Compare Ajai Chopra et al., *From Crisis to Recovery in Korea: Strategy, Achievements, and Lessons* 4 (Int'l Monetary Fund, Working Paper No. WP/01/154, 2001) (noting that Korea's dramatic economic growth masked its structural weaknesses), and Letter of Intent, *supra* note 124, at attachment para. 5 (mentioning the drop in stock prices as a further cause of bank-equity erosion), with FIN. CRISIS INQUIRY COMM'N, *supra* note 81, at 84–88, 213–15 (describing the “stabilizing” effect of rising house prices in the U.S. economy, and the subsequent bust).

both countries relied heavily on stable market prices for liquidity,<sup>133</sup> and each country was populated by “too-big-to-fail” institutions.<sup>134</sup>

Also, the two crises played out in similar ways. In 1997, the Korean crisis peaked when excessive maturity transformation in foreign-currency-denominated assets, especially among merchant banks, could no longer be sustained;<sup>135</sup> many large U.S. broker-dealers had similarly large maturity mismatches that created funding problems when credit markets collapsed in September 2008.<sup>136</sup> Additionally, both crises worsened when credit-rating downgrades—and the threat of downgrades—led to sudden liquidity scarcity (or threat of scarcity).<sup>137</sup>

Also, the strong parallels between Korea’s postcrisis bank regulatory structure and the current U.S. structure can increase confidence in the use of Korea as a bellwether for the current crisis. Korea patterned its postcrisis reform agenda on the U.S. and then-prevailing international financial regulatory standards. Korea implemented its own bank-holding-company law that hewed closely to the U.S. bank-holding-company regulatory framework, including similar provisions on ownership,<sup>138</sup> definitions of permissible

133. In the Korean case, financial institutions relied on a U.S.-dollar currency peg for some funding, which led to liquidity strains when the peg could no longer be defended. Seonuk Park, *Reforming the Korean Banking System After the IMF Era - A Proposal for a Market Driven Approach*, CURRENTS: INT’L TRADE L.J., Summer 2007, at 23, 28–29; see also KIM, *supra* note 129, at 17; Hahm & Mishkin, *supra* note 130, at 29 tbl.2, 30 (describing the large external borrowings relative to foreign currency reserves, and describing this as a “structural vulnerability”); Bang Nam Jeon, *From the 1997–98 Asian Financial Crisis to the 2008–09 Global Economic Crisis: Lessons from Korea’s Experience*, 5 E. ASIA L. REV. 103, 112 (2010) (describing currency mismatch as one leg of a “double mismatch” problem). In the U.S. case, firms relied heavily on pricing stability among mortgage-backed securities for short-term lending. See Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 J. FIN. ECON. 425 (2012).

134. In Korea, *jaebeol* enjoyed implicit government guarantees, JOHNSON & KWAK, *supra* note 127, at 42, and were eventually rescued by the government despite assurances of no bailouts. See, e.g., Todd A. Gormley et al., *Ending “Too Big to Fail”: Government Promises vs. Investor Perceptions* 2–3 (Nat’l Bureau of Econ. Research, Working Paper No. 17,518, 2011). In the United States, these problems were in the financial sector. See, e.g., *Does the Dodd-Frank Act End “Too Big to Fail?”: Hearing Before the Subcomm. on Fin. Insts. & Consumer Credit of the H. Comm. on Fin. Servs.*, 112th Cong. 59 (2011) (statement of Michael S. Barr, Professor, University of Michigan Law School) (remarking that the problems at Bear Stearns, Lehman Brothers, AIG, and other substantially interconnected financial firms “left the government with the untenable choice between taxpayer-funded bailouts and financial collapse”).

135. Cho, *supra* note 123, at 10–11; Hahm & Mishkin, *supra* note 130, at 43 (“The absence of prudential regulations on the liquidity position of merchant banking corporations and resulting maturity mismatch problems for foreign assets and liabilities played a critical role in triggering the currency crisis in December 1997.”).

136. See Markus K. Brunnermeier, *Deciphering the Liquidity and Credit Crunch 2007–2008*, J. ECON. PERSP., Winter 2009, at 77, 80.

137. Compare JOHNSON & KWAK, *supra* note 127, at 43, and Letter of Intent, *supra* note 124, at attachment para. 5, with FIN. CRISIS INQUIRY COMM’N, *supra* note 81, at 344–47.

138. Compare *geumyung jiju hoesa beop* [Financial Holding Companies Act] [FHCA], Act No. 6274, Oct. 23, 2000, as amended, art. 8 (S. Kor.), translated in 11(II) STATUTES OF

activities,<sup>139</sup> limits on covered transactions with affiliates,<sup>140</sup> approval requirements for mergers,<sup>141</sup> and supervisory authority.<sup>142</sup> Korea also implemented a capital-adequacy supervisory framework modeled on the “prompt corrective action” statute from the Federal Deposit Insurance Corporation Improvement Act of 1991 (“FDICIA”).<sup>143</sup> And Korea moved quickly after the crisis to adopt the international best practices of bank supervision promulgated by the Basel Committee.<sup>144</sup>

### B. FSS 105 and Market Distortions

In response to the liquidity problems that ultimately led to contagion and systemic crisis, the Korean government pledged to strengthen liquidity regulation for commercial and merchant banks.<sup>145</sup> In 1998, the Financial Supervisory Service (“FSS”), Korea’s consolidated financial regulator, enacted a local-currency liquidity standard, enforced as of the end of every quarter, that required banks to hold “assets with residual tenor of three months or fewer” in an amount equal to at least 100 percent of “liabilities

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THE REPUBLIC OF KOREA 965 to 965–86 (Korea Legislation Research Inst. 1997 & Supp. 48), with 12 U.S.C. §§ 1841(a)(1)–(2), 1842(a) (2006 & Supp. V 2011).

139. Compare FHCA arts. 15–19, with 12 U.S.C. § 1843(a).

140. Compare FHCA art. 48, with Federal Reserve Act § 23A, 12 U.S.C. § 371c.

141. Compare FHCA arts. 60–63, with 12 U.S.C. § 1842.

142. Compare FHCA arts. 49–59, and *geumyung jiju hoesa beop gamdok gyujeong* [Regulations on Supervision of Financial Holding Companies], Fin. Servs. Comm’n Decree No. 2000-116, Dec. 29, 2000, as amended, with Regulation Y, 12 C.F.R. pt. 225 (2012).

143. Compare *eunhaeng eop gamdok gyujeong* [Gyujeong] [Regulation on Supervision of Banking Business], Fin. Servs. Comm’n Decree No. 2000-118, Dec. 29, 2000, as amended, arts. 33–37, with 12 U.S.C. § 1831o. For more on the prompt corrective action scheme’s motivations, see Park, *supra* note 133, at 34–35.

144. See Letter from Chol-Hwan Chon, Governor, Bank of Korea, and Kyu-sung Lee, Minister of Fin. & Econ., Republic of Korea, to Michel Camdessus, Managing Dir., Int’l Monetary Fund, at attachment (May 2, 1998), available at <http://www.imf.org/external/np/loi/050298.htm> (pledging to issue for comment by mid-1999 rules to bring the country into compliance with the Basel Committee’s *Core Principles for Effective Bank Supervision*, released in 1997).

145. See *id.* (promising to implement by mid-1999 requirements for internal liquidity management systems, reporting of maturity mismatches, maintenance of positive short-term mismatches, and public release of foreign-currency liquidity data).

with residual tenor of three months or fewer.”<sup>146</sup> This is expressed in equation form as follows<sup>147</sup>:

$$\text{Local-Currency} = \frac{\text{assets with residual tenor of 3 months or fewer}}{\text{liabilities with residual tenor of 3 months or fewer}} \geq 100\%$$

Liquidity Ratio

This formulation closely mirrors the equation for the LCR.<sup>148</sup> The Korean liquidity ratio’s numerator included cash, marketable securities, and expected inflows from loans as “short-term assets.”<sup>149</sup> These categories correspond broadly to the definitions of HQLA and cash inflows under the LCR.<sup>150</sup> The Korean liquidity ratio’s denominator included maturing liabilities and a portion of demand deposits as “short-term liabilities,”<sup>151</sup> corresponding to the LCR’s outflows, which are usually composed of maturing liabilities.<sup>152</sup> Beginning in March 2002, the FSS began enforcing a “precautionary” ratio for banks that failed to maintain a local-currency liquidity ratio of at least 105 percent,<sup>153</sup> known colloquially as “FSS 105.”

Around the time of the precautionary ratio’s promulgation, Korean banks began competing with each other in the domestic mortgage market, and greatly increased the size and scale of their maturity transformation. The Korean mortgage market nearly tripled in size over four years, growing from just over 85 trillion Korean won, or \$73.9 billion, in 2002 to 200

146. See eunhaeng gamdok gyujeong [1998 Gyujeong] [Regulation on Supervision of Banks], Apr. 1, 1998, *as amended* Nov. 27, 1998, art. 29(1)(2) (repealed 2000) (current version at Gyujeong art. 26(1)(2)); eunhaeng gamdok eommu sihaeng sechik [1999 Sechik] [Detailed Regulations on Supervision of Banks], Apr. 1, 1998, *as amended* Mar. 26, 1999, app. 2 (repealed 2000) (current version at eunhaeng eop gamdok eommu sihaeng sechik [Detailed Regulations on Supervision of Banking Business], Dec. 20, 2000, *as amended*, app. 3–4). Prior to this version of the rule, banks were required to hold liquid assets (e.g., cash, notes, government bonds, and some interbank lending) equal to 30 percent of deposits. 1998 Gyujeong art. 29(1)(2); eunhaeng gamdok eommu sihaeng sechik [Detailed Regulations on Supervision of Banks], Apr. 1, 1998, app. 2 (repealed 2000).

147. 1999 Sechik app. 2.

148. Compare *supra* text accompanying note 62, with *supra* text accompanying note 147.

149. 1999 Sechik app. 2.

150. Compare *supra* notes 64–71 and accompanying text, with *supra* text accompanying note 149.

151. 1999 Sechik app. 2.

152. See *supra* notes 72–83 and accompanying text.

153. Press Release, Fin. Supervisory Serv., wonhwa yudongseong biyul jedo gaeseon [Improvements to Won-Denominated Liquidity Ratio Regulations] (July 27, 2006), available at [http://www.fss.or.kr/fss/kr/promo/bodobbs\\_view.jsp?seqno=11303&no=2&s\\_title=원화유동성비율&s\\_kind=title&page=1](http://www.fss.or.kr/fss/kr/promo/bodobbs_view.jsp?seqno=11303&no=2&s_title=원화유동성비율&s_kind=title&page=1). Expressed using terms defined in Section II.B.2 above, the rule’s ratio had a  $\lambda$  of 1.05. This gives rise to a nonconvergent “snowballing” condition. See *supra* note 91.

trillion Korean won, or \$173.9 billion, by mid-2006.<sup>154</sup> Banks funded this growth mostly with one- to two-year time deposits.<sup>155</sup> This created significant maturity transformation, as one-year time deposits funded ten-year and longer mortgage assets.

This liquidity transformation, coupled with FSS 105, provided the ingredients necessary for market distortions and reduced stability. Korean banks chose to satisfy FSS 105 by borrowing again and again from the one-year retail time-deposit market, and had to raise 105 cents on the dollar with each rollover.<sup>156</sup> Borrowing snowballed over several years, which ignited competition for the time deposits needed to meet FSS 105: as banks scrambled to bring in sufficient deposits and competed with each other on price, the spreads of one- to two-year time-deposit rates over the overnight call rate grew sharply during 2005 and the first half of 2006.<sup>157</sup>

In view of these distortions, the FSS eliminated the precautionary ratio in July 2006.<sup>158</sup> The FSS expressly referred to the precautionary ratio's market distortions in its decision to discontinue the standard.<sup>159</sup> The reporting period was shortened from every three months to every month.<sup>160</sup> The abolishment of the precautionary ratio left the FSS to enforce the background local-currency liquidity ratio and dropped the effective ratio from 105 per-

154. Chae-Sun Chung, Korea Hous. Fin. Corp., *Integrating Price Dynamics in the Prudential Norms: The Korean Example*, HOUSING FIN. INFO. NETWORK 4 (May 26, 2010), <http://hofinet.org/documents/doc.aspx?id=244> (click on "Download Document" link). To ensure comparability of the figures across time, all Korean won amounts have been converted to U.S. dollars at the rate of 1150.15 Korean won to one dollar, the U.S. Department of the Treasury Reporting Rate of Exchange as of December 31, 2011. See *Treasury Reporting Rate of Exchange as of March 31, 2012*, FIN. MGMT. SERVICE, <http://fms.treas.gov/intn.html#rates> (last updated Apr. 13, 2012).

155. In January 2002, just over half of all fixed deposits had a contractual maturity between one and two years. See *Economic Statistics System*, BANK OF KOREA, <http://ecos.bok.or.kr/> (click "English" button; then follow "3.1 Deposits" hyperlink; then click "3.1.4 Time Deposits by Term (CBs and SBs, End of)"; then click the check box next to each detailed item under the "Total" folder; then click "Download") (data retrieved Nov. 4, 2011) (giving that depository banks held 118.0 trillion won in one- to two-year fixed deposits and 103.4 trillion won in fixed deposits of all other tenors). By December 2005, this proportion had grown to three-fourths. See *id.* (193.2 trillion won and 67.9 trillion won, respectively).

156. See *supra* notes 153, 155.

157. Compare BANK OF KOREA, *supra* note 155 (click "4.2.1.1 Based on Newly Extended"; then click the check box next to each detailed item under the folder "Time Deposits"; then click "Download") (data retrieved Nov. 4, 2011), with BANK OF KOREA, *supra* note 155 (click "4.1.1 Principal Financial MarketIndicators(daily) [sic]"; then click the check box next to "Call Rate (Overnight-All Trades)"; then click "Download") (data retrieved Nov. 4, 2011).

158. YUN JEUNG-HYEON, CHAIRMAN, FIN. SUPERVISORY COMM'N, 『EUNHAENG EOP GAMDOK EOMMU SIHAENG SECHIK』 JUNG GAEJEONG SECHIK SEUNG-IN AN [PROPOSAL FOR PARTIAL AMENDMENT OF THE DETAILED REGULATIONS ON SUPERVISION OF BANKING BUSINESS] 2 (2006), available at <http://law.fss.or.kr/fss/lmx/main.jsp> (follow "은행법 및 관련규정" hyperlink; then follow "은행업감독업무시행세칙" hyperlink; then click "의안" button labeled "20060825").

159. See Press Release, Fin. Supervisory Servs., *supra* note 153, at 5.

160. YUN, *supra* note 158, at 2.

cent to 100 percent,<sup>161</sup> thus easing somewhat the snowballing borrowing under FSS 105. Later, in October 2008, the FSS further shortened the observation period for both assets and liabilities from three months to one month<sup>162</sup>; after this change, banks were required to hold “assets with residual tenor of *one month* or fewer” in an amount equal to 100 percent of “liabilities with residual tenor of *one month* or fewer.” This change further dampened snowballing effects by lengthening the time required for rollover lending to appear again in the observation period.

The Korean case demonstrates the unintended consequences of an overly prescriptive liquidity rule. The Local Currency Liquidity Ratio and FSS 105 were intended to bolster financial stability by increasing banks’ stock of liquid assets. Instead, the rules worked to undermine stability through excessive competition. There are clear lessons for policymakers responsible for implementing the Basel Committee’s recommendations: regulators should inspect domestic markets and ensure that banks have viable strategic options under the rule to avoid having banks follow a dominant compliance strategy to distort the market.

#### CONCLUSION

The costs of the financial crisis of 2007–2008 have been enormous, and the U.S. economy has yet to recover fully from the crisis’s devastating consequences. Financial regulators are charged with the difficult task of balancing the useful effects of maturity transformation with its capacity to expose both individual banks and the wider financial system to failure. The Basel Committee’s proposed Liquidity Coverage Ratio requirement will likely work to curb those risky funding strategies that represented the crisis’s most egregious regulatory failures. However, the Liquidity Coverage Ratio’s highly disparate treatment of retail and wholesale funding may instead undermine financial stability by increasing the competition for the types of funding treated preferably under the rule. These concerns are not merely theoretical: the Republic of Korea’s experience with its postcrisis liquidity regulation demonstrates that overly prescriptive rules can create market distortions as banks compete to meet snowballing regulatory requirements. When implementing the Liquidity Coverage Ratio in their jurisdictions, financial regulators must take care that competition for traditionally more stable debt such as retail deposits does not erode the very stability that supports maturity transformation and the modern financial system.

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161. The background rule required banks to hold “assets with residual tenor of three months or fewer” in an amount equal to 100 percent of “liabilities with residual tenor of three months or fewer.” See *supra* text accompanying note 147.

162. See eunhaeng eop gamdok eommu sihaeng sechik [Detailed Regulations on Supervision of Banking Business], Dec. 20, 2000, as amended, app. 3–4.



