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Erik F. Gerding

University of Colorado Law School

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The Dialectics of Bank Capital: Regulation and Regulatory Capital Arbitrage

Erik F. Gerding*

I. INTRODUCTION

Bank capital regulation has surprisingly moved from being a critical but boring tool of banking law to a politically contentious topic of national debate. Anat Admati and Martin Hellwig's book,¹ which advocates for much higher capital requirements for banks, has received scholarly plaudits.² On the other hand, senior executives of large Wall Street banks have attacked proposals for higher capital requirements as threatening economic growth.³ On the presidential campaign trail, two prominent Republican candidates made higher capital requirements a centerpiece of their financial reform proposals.⁴ Bank capital regulations have attracted a wave of excellent legal scholarship on how regulators have made these rules,⁵ how they have enforced them,⁶ and how policymakers ought to rethink the baseline for regulation.⁷

In considering the history and efficacy of capital regulations, one dynamic deserves much more academic attention than it has received—

* Professor of Law and Associate Dean for Academic Affairs, University of Colorado Law School.

1. See generally ANAT ADMATI & MARTIN HELLWIG, *THE BANKERS' NEW CLOTHES: WHAT'S WRONG WITH BANKING AND WHAT TO DO ABOUT IT* (2013).

2. John Crawford, *Capital Accounts: Bank Capital, Crises, and the Determinants of an Optimal Regulatory Approach*, 66 HASTINGS L.J. 1161, 1162–63 (2015) (citing academic reviews of Admati and Hellwig's book).

3. E.g., Tom Braithwaite, *Dimon Warns of Bank 'Nail in Coffin'*, FIN. TIMES (Mar. 31, 2011), <http://www.ft.com/intl/cms/s/0/3157bcbe-5b05-11e0-a290-00144feab49a.html#axzz41m5ZgROX> [<https://perma.cc/W5YF-V88H>].

4. Peter Schroeder, *Cruz, Kasich Spar on Bank Bailouts*, THEHILL.COM, (Nov. 10, 2015) <http://thehill.com/policy/finance/259783-cruz-kasich-spar-on-bank-bailouts> [<https://perma.cc/37Z2-SP62>] (describing views of Ohio Governor John Kasich and former Florida Governor Jeb Bush); Mark Gimein, *The 8 Weirdest Economic Ideas of the Republican Debate*, TIME.COM (Nov. 11, 2015), <http://time.com/money/4107879/republican-debate-milwaukee-fox-weird-economic-ideas/> [<https://perma.cc/BLM3-HWNM>].

5. See, e.g., Eric A. Posner, *How Do Bank Regulators Determine Capital-Adequacy Requirements?*, 82 U. CHI. L. REV. 1853 (2015).

6. See, e.g., Julie Andersen Hill, *Bank Capital Regulation by Enforcement: An Empirical Study*, 87 IND. L.J. 645 (2012).

7. See, e.g., Heidi Mandanis Schooner, *Top-Down Bank Capital Regulation*, 55 WASHBURN L.J. 327 (2016); Brett H. McDonnell, *The Promise and Perils of Top-Down Capital Regulation*, 55 WASHBURN L.J. 385 (2016).

the ways in which financial institutions game these legal rules. The strategies financial institutions use to avoid capital requirements—known collectively as regulatory capital arbitrage—merit closer study for at least two crucial reasons.⁸ First, regulatory capital arbitrage diminishes the effectiveness of bank capital rules.⁹ This is of great concern to the extent that bank capital regulation mitigates the externalities of bank failures on the broader economy. Lower levels of capital and higher levels of leverage leave banks dangerously exposed to economic shocks.¹⁰ However, regulatory capital arbitrage may camouflage this risk and give the illusion that banks enjoy a significant capital buffer and can weather a financial storm.¹¹ Indeed, some economists argue that regulatory capital arbitrage may have exacerbated the severity of the Global Financial Crisis of 2008. Prominent banks that had seemingly sufficient levels of capital nonetheless failed or required government lifelines. The gaming of regulation meant that the effective leverage of these banks and their actual fragility may have been much higher than they appeared.¹²

Second, regulatory capital arbitrage helps explain the evolution of bank capital rules. Indeed, bank capital regulation has evolved in an almost lockstep dialectical manner with regulatory capital arbitrage. Each enactment by policymakers of new capital rules has engendered new strategies by financial institutions to game those rules. This gives birth to a new generation of rules, as policymakers attempt to close loopholes and make bank capital rules more closely match the economic reality of bank balance sheets and bank risk-taking.¹³

However, the form of bank regulations may never match exactly the substance of bank risk. This stems in part from the “incompleteness” of legal rules. Incompleteness provides a fancy term for describing how laws have jurisdictional boundaries (e.g., regulators in Italy have only limited application in Japan) and how the text of legal rules cannot cover every potential future state of the world and every possible behavioral reaction to those rules.¹⁴ Moreover, financial

8. For an early, influential, and prescient account of regulatory capital arbitrage, see David Jones, *Emerging Problems with the Basel Capital Accord: Regulatory Capital Arbitrage and Related Issues*, 24 J. BANKING & FIN. 35 (2000).

9. *Id.* at 37.

10. Schooner, *supra* note 7, at 330–31; ADMATI & HELLWIG, *supra* note 1.

11. Jones, *supra* note 8, at 36.

12. *Infra* Part V.

13. *Infra* Part III.

14. Katharina Pistor & Chenggang Xu, *Incomplete Law*, 35 N.Y.U. J. INT'L L. & POL. 931, 931 (2003). Pistor and Xu argue that incompleteness may take many forms. *Id.* at 932–33. Legal rules may be incomplete because they attempt to regulate comprehensively a set of activities but omit some substantively equivalent actions. *Id.* Other legal rules are incomplete because of vague or ambiguous language which leaves the boundaries of legal rules unclear. *Id.* Pistor and Xu describe how incompleteness can result not only from bad legislative drafting, but also because of

institutions have strong incentives to react to bank capital rules by devising new strategies of regulatory capital arbitrage. If bank failures impose a negative externality on the economy, rules that attempt to internalize those costs on banks and their shareholders and managers may be inherently unstable.¹⁵

This Article attempts to cast more light on regulatory capital arbitrage, by outlining why and how banks engage in regulatory capital arbitrage and briefly sketching out how capital regulation and regulatory capital arbitrage have evolved in dialectical fashion. This Article concludes by describing and evaluating two broad approaches to dealing with the dynamic and unstable nature of capital rules (i.e. their constant erosion by regulatory capital arbitrage). The first approach—exemplified by the scholars like Anat Admati, Martin Hellwig,¹⁶ and, elsewhere in this Issue, Heidi Mandanis Schooner—is to enact simple, broad brush rules. For Admati and Hellwig, this takes the form of much higher and blunter capital requirements. Professor Schooner adds an additional nuance in her Article in this Issue. She argues that policymakers should have a different baseline for capital regulations. Instead of incrementally increasing capital regulations over time, policymakers could have a presumption, anchored in the high finance of the Modigliani-Miller theorem,¹⁷ of high capital levels. Regulators could then allow an individual bank to present evidence that its risk-taking and probability of failure are low enough to justify lowering the capital requirement.¹⁸

The second approach to addressing the recurring problem and evolving nature of regulatory capital arbitrage is to match complexity with complexity. Policymakers could accept regulatory capital arbitrage and the constant evolution of financial institutions, markets, and investments, and in response, policymakers can dynamically adjust rules to reflect these realities. That would require, however, that regulators possess the capacities and incentives both to track bank risk-taking and regulatory capital arbitrage and to adjust capital rules in a prompt and appropriate manner.

Before launching into this Article, it may help to clarify some

technological or social changes, or because legal drafters deliberately made legal rules ambiguous (whether for political reasons or to allow courts and agencies to fill in gaps). *Id.*

This account of incomplete legal rules has a mirror image in legal and economic scholarship on “incomplete” contracts. See, e.g., Oliver Hart & John Moore, *Foundations of Incomplete Contracts*, 66 REV. ECON. STUD. 115 (1999) (providing theoretical economic framework for analysis of incomplete contracts); Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87 (1989).

15. See Jones, *supra* note 8, at 36.

16. ADMATI & HELLWIG, *supra* note 1.

17. See *infra* notes 37–38 and accompanying text (explaining the Modigliani-Miller theorem).

18. Schooner, *supra* note 7, at 329.

terminology. Regulatory arbitrage as a general phenomenon has received increasing attention in legal scholarship.¹⁹ One might think of this term as simply a “high falutin’” label for how individuals or firms game or sidestep regulations. However, it is helpful to see just how regulatory arbitrage strategies work in practice and how complex they can become. It is also useful to think of regulatory arbitrage as two interconnected dynamics:²⁰

Investment switching. In the face of regulatory restrictions that might lower or foreclose investment returns, investors and financial institutions divert to alternative channels for making investments or obtaining credit that are subject to lower regulatory taxes. Investment switching often involves moving capital to parallel financial markets or other legal jurisdictions that offer close economic substitutes for a loan or investment but impose lower regulatory taxes.²¹

Investment structuring. Financial institutions or sophisticated investors also engage lawyers and other advisers (accountants, bankers, etc.) to develop legal structures to exploit the incompleteness of financial regulation. Legal innovation provides these parties with regulatory “work-arounds.” These legal structures creatively interpret legal definitions and exemptions to avoid the application of regulatory restrictions to a particular investment or source of credit. Work-arounds allow market participants to enjoy the same economic benefits of a loan or investment at a lower regulatory “tax rate.” Developing regulatory “work-arounds” for clients represents an essential role of transactional and regulatory attorneys, whom Professor Ronald Gilson famously called “transaction cost engineers.” By lowering transaction costs, Gilson argues that lawyers facilitate the efficient pricing of assets.²²

These two techniques are by no means mutually exclusive. Indeed, investment structuring—novel forms of transactions—often facilitates investment switching. For example, in another financial regulatory context, American Depositary Receipts (“ADRs”) are instruments that represent an interest in the securities of a non-U.S. company. These ADRs trade on U.S. financial markets and enable U.S. investors to invest in foreign companies without having to purchase shares directly on a foreign exchange.²³ Regulatory arbitrage is distinct from

19. See, e.g., Victor Fleischer, *Regulatory Arbitrage*, 89 TEX. L. REV. 227 (2010).

20. ERIK F. GERDING, LAW, BUBBLES, AND FINANCIAL REGULATION 236–37 (2013).

21. *Id.* at 236–37 (describing investment switching); *id.* at 241–43 (describing factors that influence the decision by an individual or a firm to engage in investment switching).

22. *Id.* at 237 (describing investment structuring); *id.* at 243–46 (describing factors that influence the decision by an individual or a firm to engage in investment structuring). See Ronald J. Gilson, *Value Creation by Business Lawyers: Legal Skills and Asset Pricing*, 94 YALE L.J. 239, 243 (1984). Gilson’s conclusion applies to transaction cost engineering, not regulatory arbitrage. The arbitrage of a regulation only makes the pricing of an asset more efficient when that regulation is welfare reducing. Undermining capital regulations that mitigate systemic risk might make capital rules less costly for firms, but more costly for society.

23. Brian P. Murray & Maurice Pessa, *The Accident of Efficiency: Foreign Exchanges, American Depositary Receipts, and Space Arbitrage*, 51 BUFF. L. REV. 383, 389 (2003) (describing American Deposit Receipts (“ADRs”)). Some economists have found that ADRs may enable financial arbitrage of foreign company securities, as arbitrageurs exploit price differences between a

deregulation. The former is a decision by regulated firms or individuals to avoid regulation to lower their effective regulatory tax rate, while the latter is a choice by regulators to change the content or enforcement of legal rules also to lower the effective regulatory tax rate.²⁴ Nonetheless, increased regulatory arbitrage and deregulation may create feedback effects for one another.²⁵

Regulatory *capital* arbitrage occurs when financial institutions or their investors engage in either investment switching or investment structuring to avoid or lower the effectiveness of regulatory capital requirements. This translates into financial institutions having higher effective leverage or making riskier investments with the same amount of leverage. As mentioned above, and as this Article further describes, regulatory capital arbitrage played a crucial role in leaving financial institutions more exposed to the subprime crisis and the larger Global Financial Crisis.²⁶

This Article proceeds as follows, Part II answers a fundamental question about regulatory capital arbitrage: why do banks seek to engage in it? Part III sketches a high-level history of the development of bank capital regulations as an evolutionary/dialectical response to regulatory capital arbitrage. Part IV examines how financial institutions engage in regulatory capital arbitrage, outlining some of the strategies, financial products, and transaction structures that financial institutions have used to sidestep the full brunt of these rules and to increase their leverage. Part V summarizes some of the evidence of the extent that firms engaged in regulatory capital arbitrage in the years before the Financial Crisis of 2008 and the consequences of that gamesmanship during the Crisis. Part VI frames the dialectics of capital regulation and regulatory capital arbitrage in terms of research into complex adaptive systems. Part VI also describes how capital regulations may be inherently unstable, and it outlines the simple and high tech approaches to this instability and the challenge of regulatory capital arbitrage.

company's ADRs and equivalent amounts of its stock traded on foreign exchanges. Mahmoud Wahab et al., *Arbitrage Opportunities in the American Depository Receipts Market Revisited*, 2 J. INT'L FIN. MARKETS, INSTITUTIONS & MONEY 97 (1993).

24. Cf. GERDING, LAW, BUBBLES, AND FINANCIAL REGULATION, *supra* note 20, at 64 (contrasting deregulation with "regulatory stimulus," which describes a broader range of actions by government officials to promote investment or lending, including repealing or rolling back legal rules, granting exemptions or waivers from legal rules, changing legal interpretations, lowering enforcement, or other actions).

25. Erik F. Gerding, *Deregulation Pas de Deux: Dual Regulatory Classes of Financial Institutions and the Path to Financial Crisis in Sweden and the United States*, 15 NEXUS: CHAPMAN J.L. POL'Y 135 (2010).

26. See *infra* Part V.

II. THE WHY OF REGULATORY CAPITAL ARBITRAGE

A great deal of recent scholarship has looked at ways to reform capital rules. Some of this has even noted the propensity of financial institutions to game and thus erode the effectiveness of bank capital regulations. However, fewer scholars have asked the all-important question: why? In other words, why are banks so intent on increasing their leverage and sidestepping rules that constrain that leverage? Furthermore, when regulations cap overall bank leverage, why do banks respond by making riskier investments?

A. Capital Requirements as Regulatory Tax

To understand first why, and later how, banks engaged in this form of regulatory arbitrage, it is critical first to highlight the functions of capital regulations. Regulatory capital requirements require that a financial institution retain a certain amount of equity based on the amount of assets it owns.²⁷ The regulatory capital cushion has two interrelated functions. First, it protects the bank from unexpected losses on its investments.²⁸ Lowering the risk of bank insolvency mitigates the negative externalities of bank failures on financial markets, as well as on the firms and taxpayers who fund government guarantees of banks, explicit or implicit.²⁹ Second, bank capital requirements reduce a firm's leverage.³⁰ Increased leverage of financial institutions not only leaves those firms more exposed to economic shocks and insolvency, it also can increase the effective supply of money in the economy and add fuel to asset price booms and bubbles.³¹

When regulations require banks to maintain more capital than they would when subject solely to market discipline (i.e. the level of capital that their creditors and investors would demand), banks view these requirements as a form of regulatory taxation.³² As they do with respect to other forms of taxation, banks incur structuring costs to reduce the regulatory burden imposed by capital requirements.³³ The goal of this

27. JEFF MADURA, FINANCIAL MARKETS AND INSTITUTIONS 492 (9th ed. 2010).

28. *Id.*

29. See Richard Herring & Til Schuermann, *Capital Regulation for Position Risk in Banks, Securities Firms, and Insurance Companies*, in CAPITAL ADEQUACY BEYOND BASEL: BANKING, SECURITIES, AND INSURANCE 15, 19 (Hal S. Scott ed., 2005) (describing rationale for capital adequacy rules of reducing systemic risk); STEPHANIE M. STULZ, BANK CAPITAL AND RISK-TAKING: THE IMPACT OF CAPITAL REGULATION, CHARTER VALUE, AND THE BUSINESS CYCLE 11 (2007) (describing literature on capital requirements mediating moral hazard of deposit insurance).

30. Viral V. Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, in REGULATING WALL STREET: THE DODD-FRANK ACT AND THE NEW ARCHITECTURE OF GLOBAL FINANCE 143, 146-47 (Viral V. Acharya et al. eds., 2011) [hereinafter Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*].

31. GERDING, LAW, BUBBLES, AND FINANCIAL REGULATION, *supra* note 20, at 366-68.

32. Jones, *supra* note 8, at 36.

33. *Id.* at 38-39.

arbitrage—called regulatory capital arbitrage—is to enable firms to reduce their capital ratios for regulatory purposes but without a corresponding reduction in economic risk (or to maintain regulatory capital ratios while *increasing* economic risk).³⁴ Regulatory arbitrage may reduce a firm’s cost of capital and make more capital available to be deployed elsewhere.³⁵

B. Cheap Debt: Government Guarantees, Systemic Risk, and the Instability of Regulatory Capital Requirements

Financial institutions have tremendous incentives to game capital requirements and increase their leverage because of the relative inexpensiveness of debt to equity financing for them.³⁶ Yet the cheapness of debt for financial institutions violates the Modigliani-Miller theorem on corporate finance. This theory holds that, under certain assumptions, a firm should have the same cost of financing whether it finances itself entirely through equity, entirely through debt, or with any mix of the two.³⁷ Several factors may explain why debt is cheaper than equity for financial institutions.³⁸ The tax-deductibility of interest payments on debt creates one distortion.³⁹

Government guarantees of financial institutions—whether explicit or implicit—provide another powerful force that makes debt cheaper than equity. By offering to bail out financial institution creditors, these guarantees make debt relatively cheap. Like black holes, guarantees exert a powerful gravitational pull towards leverage that warps regulatory and market space. Financial institutions have powerful incentives to exploit these guarantees and arbitrage capital requirements.⁴⁰

Attempting to remove these guarantees may not provide a realistic

34. *See id.* at 36, 38–39.

35. *Id.* at 38–40.

36. Acharya et al., *supra* note 30, at 157.

37. Franco Modigliani & Merton H. Miller, *The Cost of Capital, Corporation Finance and the Theory of Investment*, 48 AM. ECON. REV. 261 (1958).

38. For a comprehensive analysis of when the assumptions of the Modigliani-Miller theorem do not hold, see Peter H. Huang & Michael S. Knoll, *Corporate Finance, Corporate Law and Finance Theory*, 74 S. CAL. L. REV. 175, 177–80 (2000) (presenting the “reverse” Modigliani-Miller theorem).

39. *Tax Reform and the Tax Treatment of Debt and Equity, Joint Hearing Before the S. Comm. on Fin. & H. Comm. on Ways and Means*, 112th Cong. 6 (July 13, 2011) (statement of Victor Fleischer, Assoc. Professor, U. Colo. L. Sch.) <http://finance.senate.gov/imo/media/doc/Fleischer%20Testimony.pdf> [<https://perma.cc/7XED-X6TC>]. Professor Fleischer cites the use of hybrid instruments, such as trust preferred, as evidence that the asymmetrical tax treatment of debt and equity induces leverage. *Id.* at 9. These hybrid instruments are discussed below. *See infra* notes 60–62 and accompanying text.

40. *See* Acharya et al., *supra* note 30, at 157; Allen N. Berger et al., *The Role of Capital in Financial Institutions*, 19 J. BANKING & FIN. 393 (1995). *See also* Robert C. Merton & Zvi Bodie, *On the Management of Financial Guarantees*, 21 FIN. MGMT. 87, 95–96 (1992) (discussing limitations of capital requirements as means that guarantor can govern the debtor).

remedy. Governments provide these guarantees to mitigate systemic risk and to lower the cost of bank failures that are externalized on financial markets.⁴¹ Policymakers cannot credibly forswear government guarantees and bailouts altogether because of these potential systemic externalities of bank failures.⁴² These externalities and the prospect of government bailouts make financial regulation inherently unstable because of moral hazard (which, because of the Financial Crisis and government bailouts, is a concept many taxpayers now understand all too well).⁴³ Indeed, governments impose capital requirements to mitigate the moral hazard of financial institutions taking excessive risk at the ultimate expense of taxpayers.⁴⁴ However, the prospect of government guarantees rescuing creditors of financial institutions makes debt relatively cheap and creates powerful incentives for financial institutions to game these capital requirements and increase leverage.

Financial institution leverage has effects beyond moral hazard. This leverage feeds asset price bubbles by increasing the effective money supply. Rising prices can cover up market mispricing of risk. Leverage also leaves individual financial institutions and entire financial markets more susceptible to economic downturns.⁴⁵

Implicit government guarantees can become self-fulfilling prophecies. The widespread belief in the marketplace that the government will bail out the creditors of a financial institution will lead creditors to over-lend to that institution. If the level of lending becomes large enough, the risk of the institution failing may threaten the stability of financial markets generally. This creates strong pressure on the government to provide an actual bailout. The same logic applies to lending to entire classes of financial institutions. If creditors think the government will guarantee an entire class of institutions, lending to that class will increase. The government may not see an economically, politically, or legally principled way to bail out some institutions in the class but not others.⁴⁶

41. *See id.*; *see also* Viral Acharya & Matthew Richardson, *Causes of the Financial Crisis*, 21 CRIT. REV. 195, 197–98 (2009).

42. Acharya et al., *supra* note 30, at 157.

43. *See* Matthew Richardson, *Large Banks and the Volcker Rule*, in REGULATING WALL STREET, *supra* note 30, at 181, 184.

44. *See* Herring & Schuermann, *supra* note 29, at 19 (describing rationale for capital adequacy rules of reducing systemic risk); STULZ, *supra* note 29, at 11 (describing literature on capital requirements mediating moral hazard of deposit insurance).

45. GERDING, LAW, BUBBLES AND FINANCIAL REGULATION, *supra* note 20, at 383–85.

46. *Id.* at 324–26.

III. HISTORICAL DIALECTICS: THE BASEL ACCORDS AND REGULATORY CAPITAL ARBITRAGE

This primal impulse of financial institutions to escape capital requirements shaped the development of international and national banking regulation. A brief history of the Basel Accords, a set of international agreements among bank regulators, reveals that capital regulations and regulatory capital arbitrage co-evolved in a dialectical manner.⁴⁷ The evolution of capital requirements provides a prime example of a “regulatory dialectic” described by Edward Kane in 1986. Kane argued that financial innovation responds to regulator actions; regulators, in turn, adjust regulations in light of financial innovation.⁴⁸

In the 1980s, bank regulators in several nations (members of the Basel Committee on Banking Supervision) became concerned about the prospect of an international race-to-the-bottom in regulatory capital requirements for banks. The regulators feared banks in countries with lower capital regulations would gain a competitive advantage and would attract cross-border capital flows. In other words, regulators worried about the effects of massive investment switching on bank regulation, bank stability, and the risk of cross-border financial crises. These concerns animated the creation of the Basel I Accord.⁴⁹

In 1988, bank regulators in various countries agreed to set recommended minimum capital requirements for banks in their jurisdictions that were ultimately adopted by the G-10 countries.⁵⁰

47. Basel I and II are accords among bank regulators and central bankers from countries that belong to the Basel Committee on Banking Supervision (members come from the so-called “Group of Ten” countries: Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States). Each Accord consists of a series of recommended bank regulations and principles that national regulators should implement in their home countries. Each Accord thus attempts to set minimum international banking standards to mitigate both regulatory arbitrage by international banks and the financial risks caused by bank failure that could spread from one economy to another. For capsule summaries of the Basel Accords, see generally Robert F. Hugi et al., *U.S. Adoption of Basel II and the Basel II Securitization Framework*, 12 N.C. BANKING INST. 45 (2008); Eric Y. Wu, *Basel II: A Revised Framework*, 24 ANN. REV. BANKING & FIN. L. 150 (2005).

Although non-binding, national regulators exert pressure on one another to comply with the Accord, giving it the quality of “soft law.” See Michael S. Barr & Geoffrey P. Miller, *Global Administrative Law: The View from Basel*, 17 EUR. J. INT’L L. 15, 17 (2006) (reciting critiques of law-making by networks of bank regulators and international bureaucrats in the Basel Accord, including that the process lacks accountability and legitimacy, but arguing that Basel II is subject to a subtle structure of international administrative law); Dieter Kerwer, *Rules that Many Use: Standards and Global Regulation*, 18 GOVERNANCE 611 (2005).

48. Edward J. Kane, *Technology and the Regulation of Financial Markets*, in TECHNOLOGY AND THE REGULATION OF FINANCIAL MARKETS: SECURITIES, FUTURES AND BANKING 187 (Anthony Saunders & Lawrence J. White eds. 1986).

49. For historical background on adoption of the original Basel Accord, see Joseph Jude Norton, *Capital Adequacy Standards: A Legitimate Regulatory Concern for Prudential Supervision of Banking Activities?*, 49 OHIO ST. L.J. 1299, 1336–42 (1989). See also JONATHAN R. MACEY ET AL., BANKING LAW AND REGULATION 281–82 (3d ed. 2001) (discussing history of U.S. risk-based capital standards leading to Basel I).

50. CHARLES GOODHART, THE BASEL COMMITTEE ON BANKING SUPERVISION: A HISTORY OF THE EARLY YEARS 1974–1997 170, 180–81, 190–91 (2011) (detailing history of adoption of Basel I).

Basel I established regulatory capital requirements for the credit risk exposure of banks.⁵¹ The Basel I rules required that certain large banks maintain capital equal to 8% of the value of their risk-weighted assets.⁵²

The framers of the first Basel Accord also came to fear that banks would game simple leverage caps by stuffing riskier assets into their balance sheets. Banks would meet the leverage cap, but their risk of failure would be much higher. The drafters recognized that not all assets posed equal credit risk, and created different regulatory categories (or “buckets”) for assets based on their perceived credit risk. Assets that posed minimal credit risk required zero capital. On the other end of the spectrum, higher credit risk assets required 100% capital.⁵³

This crude approach of placing assets into risk buckets created problems. The regulatory risk weights did not match the true economic risk that assets posed for banks. In many cases, the actual credit risk was lower than the risk reflected in the regulatory weight, which created strong incentives for banks to engage in regulatory capital arbitrage (including through the techniques described below in Part IV).⁵⁴

To remedy the failings of Basel I, the Basel Committee on Banking Supervision drafted the Basel II Accord.⁵⁵ This second agreement supplemented the Basel I Accord (the risk-bucket approach was tweaked, but remains in place for many banks) and allowed certain large banks to set their capital requirements according to the bank’s own proprietary risk models. The Accord’s drafters created this policy innovation on the theory that these models would better reflect the true economic risk faced by large banks. Theoretically, the freedom to set risk capital according to their own models would not only enable banks to deploy capital more efficiently, it would also curb their incentives to engage in regulatory capital arbitrage.⁵⁶

51. BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS (1998), <http://www.bis.org/publ/bcbsc111.pdf?noframes=1> [<https://perma.cc/AT3D-MV96>] [hereinafter BASEL I].

52. *Id.* at 13.

53. *Id.* at 7–8 (establishing risk weight system).

54. Raj Bhala, *Applying Equilibrium Theory and the FICAS Model: A Case Study of Capital Adequacy and Currency Trading*, 41 ST. LOUIS U. L.J. 125, 159–62, 178, 183–87 (1997) (detailing arguments for superiority of banks’ internal models to measure risk and set capital requirements compared to regulatory methods).

55. BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS: A REVISED FRAMEWORK COMPREHENSIVE VERSION (2006), <http://www.bis.org/publ/bcbs128.pdf> [<https://perma.cc/F5UP-PSS5>] [hereinafter BASEL II]. Basel II allowed certain large banks to use proprietary risk models to set their capital requirements for not only credit risk, *id.* at 59–60, but market risk, *id.* at 191–203, and operational risk, *id.* at 147, as well.

56. See Joseph J. Norton, *A Perceived Trend in Modern International Financial Regulation: Increasing Reliance on a Public-Private Partnership*, 37 INT’L LAW 43, 53–58 (2003) (discussing mechanics and rationale for Basel II). See also Bhala, *supra* note 54 (providing arguments for use of

However, as we will see, banks and other financial institutions found ways to game these rules and used the internal-model approach to increase their leverage dramatically.⁵⁷ In December 2010, the Basel Committee responded to the flaws in Basel II, which were exposed by the Panic of 2007–2008 with a third accord, Basel III.⁵⁸ Basel III ramps up the complexity of capital requirements by requiring that banks maintain capital against a wider range of risks (e.g., liquidity risk) and by setting intricate, even convoluted formulae for calculating those separate capital cushions. Time will tell how banks will arbitrage this third Basel incarnation.

IV. THE “HOW” OF REGULATORY CAPITAL ARBITRAGE

A. Financial Instruments as Tools of Regulatory Capital Arbitrage

Banks and other financial institutions game the types of capital requirements envisioned by Basel I and II in a number of ways. The most important forms of regulatory capital arbitrage have involved various types of investment structuring facilitated by securitization and derivatives.⁵⁹

Regulatory capital arbitrage generally entails banks gaming traditional bank capital ratios by playing with the numerator and denominator of those ratios.⁶⁰ Simple regulatory capital requirements mandate that financial institutions maintain a capital ratio comprised of equity in the numerator and assets in the denominator.⁶¹ The Basel I and Basel II accords contained complex rules for what types of equity instruments could count towards the numerator.⁶² As noted above, the Accords also required different ratios of capital for different categories of assets in the denominator, depending on the believed riskiness of the assets.⁶³

Banks could game these traditional capital rules by cosmetically

internal models approach).

57. *Infra* Part IV.B; Erik F. Gerding, *Code, Crash, and Open Source: The Outsourcing of Financial Regulation to Risk Models and the Global Financial Crisis*, 84 WASH. L. REV. 127, 159, 180–82 (2009) [hereinafter Gerding, *Code, Crash, and Open Source*].

58. BASEL COMM. ON BANKING SUPERVISION, *BASEL III: A GLOBAL REGULATORY FRAMEWORK FOR MORE RESILIENT BANKS AND BANKING SYSTEMS* (2010) http://www.bis.org/publ/bcbs189_dec2010.pdf <https://perma.cc/LZQ5-4LLX>].

59. Some senior regulators recognized this potential and expressed concern as early as 1998. *E.g.*, Laurence H. Meyer, Governor, Fin. Globalization & Efficient Banking Regulation, Remarks at the Annual Washington Conference of the Institute of International Bankers (Mar. 2, 1998). <http://www.federalreserve.gov/boarddocs/speeches/1998/19980302.htm> [https://perma.cc/9VLV-KGGK].

60. Jones, *supra* note 8, at 36.

61. MADURA, *supra* note 27, at 429.

62. See Benton E. Gup, *Capital Games*, in *CAPITAL MARKETS, GLOBALIZATION, AND ECONOMIC DEVELOPMENT* 17 (Benton E. Gup ed., 2005).

63. *Id.*

increasing the numerator in the ratio— for example, through gains trading or under-provisioning for loan loss reserves.⁶⁴ Banks also gamed the numerator by developing hybrid securities, such as trust preferred securities. These securities are treated like debt for tax purposes (with interest payments being subject to tax deductions), but as capital for bank regulatory purposes.⁶⁵ Trust preferred securities had debt-like features, including required “interest” payments to holders (with some ability of the bank to defer payments for limited time periods).⁶⁶ Commentators have faulted the performance of these instruments during the Financial Crisis. The responsibility of banks to make “debt payments” combined with a freeze in the market for issuances of trust preferred securities during the Crisis underscored that these securities did not provide the same cushion against losses as plain vanilla equity.⁶⁷

The games that banks have played with the numerator of regulatory capital ratios pale in comparison to the prevalence and complexity of their strategies to manipulate the denominator.⁶⁸ Securitization has played a vital role in these efforts.⁶⁹ In a securitization transaction, an investment vehicle purchases and pools together various loans or other assets that have predictable future cash streams provided by the underlying assets. Those cash streams collateralize and fund securities that the vehicle issues to investors in capital markets. The investment vehicle typically issues different classes (or tranches) of securities, with senior classes having prior contractual claims on the cash streams. The tranches thus offer investors different mixes of risk and reward.⁷⁰

Securitization has evolved into numerous specialized variants, including asset-backed commercial paper. Companies seeking financing create asset-backed commercial paper by first selling cash-producing assets into an investment vehicle. The investment vehicle then issues

64. *Id.*

65. See Acharya et al., *supra* note 30, at 161, 175.

66. *Id.* at 161. Trust preferred securities were in turn securitized to develop more liquid markets for these securities. *Id.*

67. *Id.* at 161, 176–77. The Dodd-Frank Act restricts the use of trust preferred securities for meeting regulatory capital purposes. *Id.* at 176–77.

68. Jones, *supra* note 8, at 36.

69. *Id.*

70. For a description of the mechanics and economic benefits of securitization, see Gerding, *Code, Crash, and Open Source*, *supra* note 57, at 147–49; Anand K. Bhattacharya & Frank J. Fabozzi, *Expanding Frontiers of Asset Securitization*, in *ASSET-BACKED SECURITIES 1* (Anand K. Bhattacharya & Frank J. Fabozzi eds., 1996); Leon T. Kendall, *Securitization: A New Era in American Finance*, in *A PRIMER ON SECURITIZATION 1–8* (Leon T. Kendall & Michael J. Fishman eds., 1997); Steven P. Baum, *The Securitization of Commercial Property Debt*, in *A PRIMER ON SECURITIZATION 45*; Joshua Coval et al., *The Economics of Structured Finance*, 23 *J. ECON. PERSP.* 3 (2009).

short term securities with maturities of between 90 and 180 days.⁷¹ Aside from issuing securities with shorter maturities, asset-backed commercial paper differs from traditional securitization in several other respects. First, the investment vehicle in asset-backed commercial paper, called a “conduit,” may purchase a revolving set of assets that may change over time.⁷² Second, as commercial paper matures, the conduit will issue new paper to investors, the proceeds of which will be used to purchase fresh assets and pay the fees of the various service providers to the transaction.⁷³ These first two features mean that conduits may suffer an asset-liability mismatch, as they have short-term obligations to investors, yet hold longer-term assets. This mismatch potential leads to a *third* feature of asset-backed commercial paper that differs from traditional securitizations: in exchange for a fee, a third party often agrees to provide liquidity support to the vehicle in the form of infusions of cash or liquid assets as needed.⁷⁴ Like securitizations, asset-backed commercial paper issuances often include credit support (in the form of bond insurance, credit derivatives, or other financial guarantees) from another financial institution.⁷⁵

Securitization, in whatever form, offers the lenders who sell assets to an investment vehicle for cash a way to solve a mismatch between long-term assets and short-term liabilities. It affords investors the ability to participate in lending markets with securities that (theoretically) can be more liquid than loans themselves and that are tailored to particular investment needs. More generally, securitization provides a mechanism to transfer and spread credit risk from lenders to investors.⁷⁶

Yet securitization has also been a valuable tool in gaming regulations. This latter role may have eclipsed its other economic benefits. The use of securitization in regulatory capital arbitrage may be understood through two insights. First, securitization can game the fact that traditional capital regulations place assets in certain risk buckets. By unbundling and reassembling the cash streams and risk from underlying assets, securitization allows firms to create tranches of instruments that qualify for a particular regulatory bucket. Yet these financial firms can then secretly “stuff” more economic risk into a

71. Viral V. Acharya & Matthew Richardson, *Causes of the Financial Crisis*, 21 CRIT. REV. 195, 201 (2009).

72. FITCH RATINGS, ASSET-BACKED COMMERCIAL PAPER EXPLAINED 1 (2001). <http://pages.stern.nyu.edu/~igiddy/ABS/fitchabcp.pdf> [<https://perma.cc/6XYW-PD5K>].

73. *Id.*

74. Viral V. Acharya et al., *Securitization Without Risk Transfer* 2 (Nat'l Bureau of Econ. Research Working Paper No. 15730, 2010).

75. In addition, some conduits purchase a mix of different assets to diversify the portfolio. FITCH RATINGS, *supra* note 72.

76. Gerding, *Code, Crash, and Open Source*, *supra* note 57, at 148–49.

particular tranche than regulators assumed when they created the risk weight for that bucket.⁷⁷

Second, securitization plays with the regulatory treatment of guarantees. David Jones explains this using the following example. Assume a firm has a balance sheet with assets of \$100 in loans, liabilities of \$95 in deposits, and \$5 in equity. This firm's implied leverage ratio is thus 5%. If a firm were to sell \$50 in loans to a third party and provide an off-balance sheet guarantee for those loans (for example, through a standby letter of credit or other form of credit enhancement), it would have the same economic risk. Yet its capital ratio per its balance sheet would dramatically improve, jumping to 10% (\$5 in equity divided by \$50 in on-balance sheet loans).⁷⁸ The first two Basel Accords prohibit this simple form of regulatory capital arbitrage by imposing regulatory capital requirements on financial guarantees. The Accords require that when the bank issues a guarantee on assets that it has sold itself, the guarantee is deemed to be "recourse." This generally means that the bank must maintain capital equal to the bank's maximum potential credit loss under the guarantee. Nevertheless, banks use securitization and other shadow banking instruments to create effective guarantees that do not require that the financial institution maintain regulatory capital for the full amount of economic risk the banks retain.⁷⁹

B. Six Strategies for Regulatory Capital Arbitrage

These two insights—the capacity of securitization to manipulate regulatory risk buckets and the creative use of guarantees—help explain six common strategies for regulatory capital arbitrage:

1. Concentrating Credit Risk and Cherry Picking

Under the first strategy, banks structure asset-backed securities so that subordinated tranches of asset-backed securities bear high concentrations of economic risk (that is, they are more at risk for loss should the loans that back the securitization default). Yet, these junior tranches of asset-backed securities are subject to low relatively low regulatory capital requirements; in other words, the capital that a bank must maintain against these securities according to regulation is lower than appropriate given the true economic risk of those securities. The senior tranches in the securitization contain a correspondingly low degree of economic risk, but would require relatively higher capital;

77. Jones, *supra* note 8, at 41–44.

78. *Id.* at 40.

79. *Id.* at 40–42.

they would bear the brunt of the regulatory capital requirements. The issuing bank then retains the subordinated securities and sells the senior securities to outside investors.⁸⁰

Scholars have also claimed that banks used the flip side of the same strategy: banks would securitize assets and then purchase the resultant AAA-rated senior securities. These securities would contain more economic risk than assumed by the regulatory capital requirements.⁸¹ These AAA-rated securities were treated as having minimal credit risk and no liquidity or funding risk.⁸² Banks could thus have their cake (enjoy fat premiums on their asset-backed security investments, which were particularly high for securitizations backed by subprime mortgages) and eat it too (lower their regulatory capital below economic risk).⁸³

2. Remote Origination

The second strategy is to ensure “remote origination,” namely that the issuer of the asset-backed securities is not affiliated with the original lender that made the underlying loans. Securitizations involve remote originators for many reasons (primarily bankruptcy).⁸⁴ However, bank regulations provide another reason; capital regulations historically required only an 8% capital ratio if the bank issued a guarantee of loans owned by someone else. This provides an explanation for one structural feature of some asset-backed commercial paper programs: the credit enhancements provided by the sponsoring bank require lower capital when some other entity (other than the sponsoring bank) originates the assets that will back the commercial paper sold to investors.⁸⁵

Remote origination also had benefits for the lenders. By selling loans into a securitization, these lenders were able to move those assets off their balance sheets. The lenders could then hold little or no capital against those assets on the theory that they bore minimal risk for those assets. However, the Financial Crisis and the collapse of investor demand for mortgage-backed securities revealed that originating

80. *Id.* at 42–44.

81. Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at 149.

82. *Id.* at 148.

83. Acharya & Richardson, *supra* note 71, at 204–05.

84. If the originator is deemed to have made a “true sale” of the assets to the structured investment vehicle, the assets are no longer considered part of the estate of the originator in bankruptcy. The structured investment vehicle is then the outright owner of the mortgages or other assets, and the originator no longer has any impact on the risk being transferred from borrowers to the structured investment vehicle and investors. Originating lenders would often transfer assets to securitization vehicles via one or more intermediate trusts to further ensure bankruptcy remoteness. For a discussion of “true sales” in securitizations, see Steven L. Schwarcz, *Securitization Post-Enron*, 25 *CARDOZO L. REV.* 1539, 1543–48 (2004).

85. Jones, *supra* note 8, at 44–45.

lenders in fact continued to bear substantial risk even for assets they sold.⁸⁶ Originating banks (and other mortgage lenders) were subject to warehouse risk, i.e., the risk of being unable to sell mortgages they originated and offload the credit, liquidity, and interest rate risk associated with those loans.⁸⁷

Moreover, even when banks successfully sold loans into a securitization, they may also have had recourse obligations for those assets.⁸⁸ Although accounting and bank regulatory capital standards may have treated the likelihood of these obligations being triggered as remote, these obligations caused significant losses for banks and other financial institutions.⁸⁹ Indeed, large financial institutions that sold mortgages into securitizations have agreed to settlements totaling billions of dollars because those mortgages violated representations and warranties about mortgage quality and underwriting standards. This massive recourse liability meant that a significant amount of risk that banks moved off their balance sheet in securitizations eventually rematerialized on their financial statements.⁹⁰

3. Indirect Credit Enhancements and Creative Guarantees

The third strategy exploits the regulatory treatment of other forms of economic guarantees provided by banks for securitization vehicles. In essence, these guarantors bear more economic risk than suggested by the regulatory capital required.⁹¹

For example, banks carefully structured the liquidity enhancements that they provided to asset-backed commercial paper vehicles to obtain lower risk weights for these guarantees under capital regulations.⁹²

86. Erik F. Gerding, *Bank Regulation and Securitization: How the Law Improved Transmission Lines Between Real Estate and Banking Crises*, 50 GA. L. REV. 89, 116 (2015). See FIN. CRISIS INQUIRY COMM'N, THE FINANCIAL CRISIS INQUIRY REPORT 74 (2011) (explaining how mortgage originators were adversely affected when investor demand for “risky assets” sharply declined).

87. Gerding, *supra* note 86, at 116; Adrian D’Silva & Brian Gordon, *Hedges in the Warehouse: The Banks Get Trimmed*, (Fed. Reserve Bank of Chi. Fin. Mkts. Grp., Policy Discussion Paper, No. 2008-5, 2008), available at http://www.chicagofed.org/digital_assets/publications/policy_discussion_papers/2008/PDP2008-5.pdf.

88. Gerding, *supra* note 86, at 116; Erik F. Gerding, *The Shadow Banking System and Its Legal Origins* 42 (Aug. 23, 2011) (unpublished manuscript) (on file with author) (explaining the imposition of regulatory capital requirements) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1990816 (giving an example of when a bank may be exposed to a recourse obligation). Securitization sponsors may also have obligations to warehouse lenders. See

Richard Stanton, Johan Walden & Nancy Wallace, *The Industrial Organization of the US Residential Mortgage Market*, 6 ANN. REV. FIN. ECON. 259, 271 (2014) (relating New Century’s inability to pay the margin calls made by its warehouse lenders).

89. Gerding, *supra* note 86, at 116. See Stanton, Walden & Wallace, *supra* note 88, at 271 (discussing New Century’s inability to satisfy its obligations).

90. Gerding, *supra* note 86, at 116. See e.g., Andrew Grossman & Christina Rexrode, *Citigroup to Pay \$7 Billion in Mortgage Probe*, WALL ST. J. (July 14, 2014).

91. *Id.* at 45–46.

92. *Id.*; see also Acharya et al., *Securitization Without Risk Transfer*, *supra* note 74; Acharya et

Careful structuring allowed banks that provided liquidity enhancements to maintain only 0.8% capital against the value of assets in the asset-backed commercial paper vehicle (compared to the 8% capital that would be required had these assets been on the bank's balance sheet).⁹³ On the assumption that there was minimal risk that these guarantees would be triggered, U.S. bank regulators effectively exempted these liquidity enhancements from capital requirements for the sponsoring banks.⁹⁴ The asset-backed commercial paper market responded with explosive growth. It doubled from \$600 billion outstanding in 2004 to \$1.2 trillion outstanding as of the second quarter of 2007.⁹⁵

The market freeze during the Financial Crisis triggered these liquidity guarantees and revealed the mistake of this light regulatory capital treatment.⁹⁶ Asset-backed commercial paper transactions were structured so that, when the crisis struck, investors bore only 4.3% of the loss of the \$1.25 trillion outstanding in asset-backed commercial paper. Guarantors bore the remainder.⁹⁷ Empirical studies show when asset-backed commercial paper investment vehicles suffered losses during the Crisis, sponsoring banks—and not investors—generally bore the losses.⁹⁸ Risk materialized on the balance sheets of sponsoring banks despite the light capital treatment.⁹⁹ This led several scholars to brand asset-backed commercial paper as “securitization without risk transfer” and to conclude that a primary driver of these securitization structures was regulatory capital arbitrage.¹⁰⁰

In addition to liquidity enhancements, banks designed other creative, indirect guarantees. For example, banks designed complex credit enhancements for those securitizations that resembled revolving credit facilities, such as collateralized loan agreements (a form of collateralized debt obligation (“CDO”)) and securitizations of credit card receivables.¹⁰¹ Careful structuring meant that these credit

al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at 148.

93. Viral V. Acharya & Phillip Schnabl, *Do Global Banks Spread Global Imbalances? Asset-Backed Commercial Paper During the Financial Crisis of 2007-09*, 58 IMF ECON. REV. 37, 50 (2010).

94. Acharya et al., *Securitization Without Risk Transfer*, *supra* note 74, at 12.

95. See Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at 148–49.

96. Acharya et al., *Securitization Without Risk Transfer*, *supra* note 74; Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at 148.

97. See Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at 149.

98. Acharya & Schnabl, *supra* note 93, at 61–63.

99. *Id.*

100. Acharya et al., *Securitization Without Risk Transfer*, *supra* note 74, at 31–34.

101. Jones, *supra* note 8, at 46. The assets backing these securitizations may be paid off (“drawdowns”) by borrowers quickly, yet investors purchasing the asset-backed securities may prefer a much longer maturity on their securities. *Id.* Banks sponsoring these securitizations covered any potential resulting mismatches between an investment vehicle's fluctuating assets and its issued securities by creating “master trusts.” *Id.* at 46–47. Under these trusts, the bank “designates” lines of credit for the investment vehicle. *Id.* at 46–47.

enhancements required no or minimal regulatory capital for the banks that provided them.¹⁰²

Still other guarantees from banks and financial institutions were implicit. Although many sponsors of securitizations had no contractual obligation to support a failing investment vehicle, the marketplace expected that the firm would step in should the vehicle experience extreme losses.¹⁰³ A financial institution that failed to honor these expectations might suffer a severe reputation loss and be unable to find financing in the future.¹⁰⁴ Scholars have found that, to avoid this fate, sponsors would go to great lengths to support investment vehicles.¹⁰⁵ If sponsors of securitization could provide “moral recourse” for these vehicles without agreeing explicitly and contractually to provide a guarantee, they could avoid capital requirements and other legal costs.¹⁰⁶

4. Third-Party Guarantees

Banks also engaged in regulatory capital arbitrage when they purchased asset-backed securities that enjoyed third-party guarantees via credit derivatives or bond insurance. Those guarantees allowed the banks that invested in senior asset-backed securities to maintain as little as zero capital against those investments. Regulations allowed banks to maintain no capital even though capital markets priced the credit risk on those assets (when adjusted for the guarantees) at more than zero. Banks widely exploited this loophole. For example, AIG’s 2007 Annual Report disclosed that \$379 billion of its \$527 billion credit derivative exposure (created by its infamous Financial Products Group) represented derivatives sold to financial institutions seeking to engage in this form of regulatory capital arbitrage.¹⁰⁷

102. The sponsoring bank’s credit exposure under these lines of credit was considered minimal. *Id.* Thus, a bank’s credit enhancement was considered to constitute not credit risk (which would require regulatory capital under Basel), but operational risk (which would not require regulatory capital). *Id.*

103. Gary B. Gorton & Nicholas S. Souleles, *Special Purpose Vehicles and Securitization*, in *THE RISKS OF FINANCIAL INSTITUTIONS* 549, 551–52 (Mark Carey & René M. Stulz eds. 2007). Gorton and Souleles provide a model for implicit recourse. *Id.* at 575–78. The model explains how “[t]he sponsoring bank and the investors in the SPV collude in adopting a contractual mechanism that cannot be written down because of accounting and regulatory rules.” *Id.* at 576.

104. *Id.* As financial institutions judged that the probability of this non-contractual liability was low, they decided that they did not need to treat these moral recourse obligations as a balance sheet liability. Stephen G. Ryan, *Accounting in and for the Subprime Crisis*, 83 *ACCT. REV.* 1605, 1632 (2008).

105. Gorton & Souleles, *supra* note 103, at 565 (surveying others studies finding moral recourse), 580–87 (testing for and finding evidence of marketplace assumption of moral recourse by securitization sponsors).

106. *See generally id.* (discussing how regulators recognized the problem of moral recourse, but providing tests that show sponsors of securitizations nonetheless appear to have provided non-contractual guarantees).

107. Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at

5. Moving Assets from Banking Book to Trading Book

The 1997 Market Risk Amendment to the Basel Accords facilitated additional forms of regulatory capital arbitrage. These amendments allowed certain banks to set regulatory capital for certain risks in their trading books. This encouraged banks to move asset-backed securities and other shadow banking instruments from their banking books to their trading books to lower their regulatory capital dramatically.¹⁰⁸

6. Exploiting Basel II's Do-it-Yourself Capital Requirements

As noted above, the Basel II Accord allowed certain large financial institutions to set their own regulatory capital levels according to their proprietary risk models. When the Securities and Exchange Commission extended this approach to certain large investment banking conglomerates, many of those firms dramatically increased their leverage ratios to over 30:1 within a three-year span.¹⁰⁹ In other words, financial institutions used these models to lower their capital requirements.¹¹⁰ Financial institutions used these same models to measure firm risk management policies and price asset-backed securities, credit derivatives, and other shadow banking instruments.¹¹¹

C. Regulatory Capital Arbitrage as Compound Arbitrage; Rating Agencies

Many of the six evasion strategies described above depended on asset-backed securities or other shadow banking instruments and counterparties receiving investment grade ratings from credit rating agencies.¹¹² Financial institutions played a different set of games to achieve higher ratings. For example, scholars have examined how the financial institutions that designed and marketed asset-backed securities shopped among rating agency firms for higher ratings. The firms that put together securitizations determined which ratings firm would get hired for a particular transaction. Competition among ratings firms, combined with negligible liability for giving unwarranted investment grade ratings, created perverse incentives for the agencies to please the firms holding the purse strings.¹¹³

149–50.

108. Jones, *supra* note 8, at 48; see also Robert P. Bartlett, III, *Making Banks Transparent*, 65 VAND. L. REV. 293 (2012).

109. See Gerding, *Code, Crash, and Open Source*, *supra* note 57, at 159 (citing Stephen Labaton, *Agency's '04 Rule Let Banks Pile Up New Debt, and Risk*, N.Y. TIMES, Oct. 3, 2008, at A1).

110. See Gerding, *Code, Crash, and Open Source*, *supra* note 57, at 154–59.

111. *Id.* at 139–43, 147–64.

112. Acharya & Schnabl, *supra* note 93, at 85.

113. Edward I. Altman et al., *Regulation of Rating Agencies*, in REGULATING WALL STREET,

The gaming of rating agencies may have taken even more sophisticated forms. In the wake of the SEC's 2010 lawsuit against Goldman Sachs, newspapers reported that the investment bank took advantage of a decision by rating agencies to disclose their methodologies in rating asset-backed securities. Using this disclosure, Goldman Sachs and other banks were able to reverse engineer rating agency models and then obtain higher and unjustified ratings for riskier asset-backed securities.¹¹⁴ In short, even regulation outsourced to private entities can suffer from regulatory arbitrage.¹¹⁵ These various games that financial institutions played with rating agencies assumed fresh importance in the context of regulatory capital arbitrage; these games further undermined capital regulations.

Similarly, interpretations of bank regulators that allowed lenders to lower their regulatory capital requirements by securitizing assets depended on the securitization qualifying as a true sale for bankruptcy and accounting purposes.¹¹⁶ Thus the gaming of bankruptcy and

supra note 30, at 443, 448–53 (describing conflict of interest when issuer of securities pays rating agencies for rating).

Law Professor Frank Partnoy has been a longtime critic of rating agency regulations. Professor Partnoy has long argued that regulation is part of the problem. *See, e.g.*, Frank Partnoy, *The Siskel and Ebert of Financial Markets?: Two Thumbs Down for the Credit Rating Agencies*, 77 WASH. U. L.Q. 619, 681 (1999). Instead of creating incentives for better monitoring, regulators have undermined those incentives by granting rating agencies a kind of oligopoly power. *See id.* at 698. This power stems from the fact that the securitization market, including the market for mortgage-backed securities, focuses largely on institutional investors. Kendall, *supra* note 70, at 15.

Many of these institutional investors are restricted by regulation to purchasing only securities with an investment-grade credit rating. *E.g.*, James Hedges, *Hedge Fund Transparency*, in HEDGE FUNDS: STRATEGIES, RISK ASSESSMENT, AND RETURNS 315, 316 (Greg N. Gregoriou et al. eds., 2003) (discussing regulations that discourage mutual funds from investing in debt below investment grade). For example, regulations restrict much of the securities investments of many pension funds, and regulated financial institutions, including banks and insurance companies, to investment-grade debt. *See, e.g.*, GENERAL ACCOUNTING OFFICE, COMMUNITY AND ECONOMIC DEVELOPMENT LOANS: SECURITIZATION FACES SIGNIFICANT BARRIERS 41 n.41 (2003) (discussing requirements on pension funds); Partnoy, *supra*, at 700–01 (outlining use by state regulators of rating agencies' ratings in insurance regulations).

These "investment-grade" restrictions are designed to ensure the safety of an entity's assets, and, in the case of a bank or other regulated financial institution, to mitigate systemic risk. *Cf.* Viral V. Acharya, A Theory of Systemic Risk and Design of Prudential Bank Regulation (Jan. 9, 2001) (unpublished manuscript) (available for download at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=236401 [<https://perma.cc/C8L3-B7DM>]) (analyzing whether prudential bank regulations, including limitations on investments, mitigates systemic risk).

These investment-grade regulations, in turn, provide that only rating agencies that have a special license from the Securities and Exchange Commission as "Nationally Recognized Statistical Rating Organizations" ("NRSROs") can give an investment-grade rating. Partnoy, *supra*, at 623.

The handful of NRSROs, and the models they use to rate securities, thus possess great responsibility for regulating the riskiness of investments made by a large number of financial institutions. Professor Partnoy contends that rating agencies rent out the regulatory license they enjoy by virtue of this web of regulations. *See* Partnoy, *supra*, at 623–24.

114. Gretchen Morgenson & Louise Story, *Rating Agency Data Aided Wall Street in Deals*, N.Y. TIMES, Apr. 23, 2010 at A1.

115. *See generally* Gerding, *Code, Crash, and Open Source*, *supra* note 57.

116. MELANIE L. FEIN, SECURITIES ACTIVITIES OF BANKS § 13.04 (3d ed. Supp. 2010).

accounting rules also contributed to regulatory capital arbitrage.¹¹⁷

V. THE CRISIS AND THE EFFECTS OF REGULATORY CAPITAL ARBITRAGE

Taking a step back from individual arbitrage strategies, a troubling picture of the effect of regulatory capital arbitrage emerges. Although the various shadow banking instruments were designed to spread risk, most of the credit risk stayed within the financial system. A 2008 study reports that banks, thrifts, government-sponsored entities, and broker-dealers held \$789 billion—or roughly 50%—of the AAA-rated CDO tranches outstanding.¹¹⁸ At the same point, banks, broker-dealers and monoline bond insurers held \$320 billion of the \$476 billion of subordinated CDO tranches.¹¹⁹ A 2008 International Monetary Fund report documented how balance sheets of a sample of ten very large financial institutions doubled from 2004 to 2007, yet the implied risk of their balance sheets under the Basel Accord registered only a modest uptick.¹²⁰

This suggests that the most troubling problem with securitization (and shadow banking generally) is not that financial institutions unloaded high credit risk assets onto non-financial institution investors. On the contrary, too much of the toxic risk stayed on the balance sheets of financial institutions or was passed from one institution to another.¹²¹ The system did not diffuse risk, but hid, recycled, and concentrated it in complex daisy chains. Securitization only pantomimed its stated role of transferring risk in the service of letting banks escape capital rules. Professors Acharya and Richardson explain that this evasion of capital regulations was the driving force behind securitization in the years leading up to the Crisis. They write:

[E]specially from 2003 to 2007, the main purpose of securitization was not to share risk with investors, but to make an end run around capital-adequacy regulations. The net result was to keep the risk concentrated in the financial institutions—and, indeed, to keep the risk at a greatly magnified level, because of the over-leveraging it allowed.¹²²

These statistics support the earlier predictions of scholars on the pernicious effects of regulatory capital arbitrage. Well before the Crisis, some scholars worried that regulatory capital arbitrage would result in

117. See *supra* Part IV.A.

118. See Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at 149.

119. *Id.*

120. *Id.* at 150 (citing INT'L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT: CONTAINING SYSTEMIC RISKS AND RESTORING FINANCIAL SOUNDNESS 31 (2008) <http://www.imf.org/external/pubs/ft/gfsr/2008/01/pdf/text.pdf> [<https://perma.cc/9HLT-E6L6>]).

121. See Hyun Song Shin, *Securitisations and Financial Stability*, 119 *ECON. J.* 309 (2009).

122. Acharya & Richardson, *supra* note 71, at 197 (2009).

an effective deterioration of risk-based capital standards.¹²³ They worried that regulatory capital arbitrage could mask growing financial problems at banks and frustrate both market discipline and regulatory actions to address failing banks.¹²⁴ Some scholars attribute the fact that many large complex financial institutions that failed during the Crisis—Bear Stearns, Washington Mutual, Lehman Brothers, Wachovia, and Merrill Lynch—actually had higher capital than required by regulation to regulatory capital arbitrage. This arbitrage masked the true economic risk of these firms.¹²⁵ Moreover, regulatory capital arbitrage can discourage a true hedging of economic risks.¹²⁶ As already noted, higher leverage can effectively externalize more of a firm's risk on the marketplace and on the government.¹²⁷

VI. CONCLUSION: COMPLEX ADAPTIVE SYSTEMS AND SOLUTIONS, SIMPLE AND HIGH TECH

Regulatory arbitrage, in general, and regulatory capital arbitrage, in particular, will remain features of the landscape of the financial markets and financial regulation well into the future. Financial institutions and other market participants have strong incentives to game financial rules that restrict their risk-taking and profits. Financial institutions have particularly sharp incentives to engage in regulatory capital arbitrage. The presence of government guarantees—explicit and implicit—and externalities from the failure of financial institutions continue to make debt relatively cheaper than equity for financial institutions. This creates a strong impulse for financial institutions to lever up, using investment structuring and switching, to sidestep legal rules restricting their ability to increase leverage or risk-taking. Moreover, the capacity of leverage to turbocharge returns to equity holders, including bank managers and traders compensated through stock or options, creates internal pressures on the banks to find creative and opaque ways to finance themselves through debt.

This explains the dialectical co-evolution of capital regulations and regulatory capital arbitrage described above. Regulators must impose capital requirements to reduce the systemic effects of excessive financial institution leverage and the moral hazard from government guarantees. However, each and every historical attempt to set capital requirements

123. Jones, *supra* note 8, at 49.

124. *Id.*

125. See Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at 147.

126. Jones, *supra* note 8, at 37.

127. See Acharya et al., *Capital, Contingent Capital, and Liquidity Requirements*, *supra* note 30, at 157; see also Acharya & Richardson, *supra* note 71, at 197–98.

has resulted in new forms of regulatory capital arbitrage. The United States and Britain worried that their early regulatory capital requirements would drive capital overseas to less regulated jurisdictions. This resulted in the first Basel Accord. Yet financial institutions found ways to game that agreement's crude risk-bucket approach. So bank regulators responded with the Basel II Accord and allowed large banks to set capital according to their proprietary risk models. Not surprisingly, financial conglomerates used this approach to lower effective capital and raise leverage. Now regulators have rolled out Basel III. To quote Kurt Vonnegut, "and so it goes."¹²⁸

The incentives to engage in regulatory arbitrage and regulatory capital arbitrage increase during prolonged market bubbles. The prospect of being shut out of enjoying the increased profits in a booming asset market sharpens the legal creativity and appetite for legal risk of investors and financial institutions. In turn, increased regulatory arbitrage, particularly of rules like capital requirements that arguably might otherwise throttle back lending or investment, can, in turn, further inflate a bubble.¹²⁹

Addressing the pervasive and recurring effects of regulatory capital arbitrage demand both new intellectual frameworks and new policy approaches. This final part of the Article first attempts to reframe the problem of regulatory capital arbitrage and its dialectical evolution with capital rules in terms of research into complex, adaptive systems. The Article next briefly examines how the upshot of regulatory capital arbitrage may be that bank capital requirements and other prudential banking regulations may suffer from inherent instability. Finally, the Article describes two policy approaches to addressing this instability, specifically: "simple" and "complex."

A. Complex Adaptive Systems

A different scholarly lens can reveal deeper patterns in the interaction of capital regulation and regulatory capital arbitrage. Research into complex adaptive systems may help explain the regulatory arbitrage described above.¹³⁰ Complex adaptive systems are the centerpiece of complexity science, a somewhat amorphous, interdisciplinary field that engages economists, computer scientists, and natural scientists. These scholars study how simple interactions between

128. See generally KURT VONNEGUT, *SLAUGHTERHOUSE-FIVE* (The Dial Press 2005) (1969).

129. GERDING, *LAW, BUBBLES, AND FINANCIAL REGULATION*, *supra* note 20, at 383.

130. For a provocative application of complex adaptive systems to financial institution regulation, see Lawrence G. Baxter, *Internationalization of Law: The "Complex" Case of Bank Regulation*, in *THE INTERNATIONALISATION OF LAW: LEGISLATING, DECISION-MAKING, PRACTICE AND EDUCATION* 3 (William Van Caenegem & Mary E. Hiscock eds. 2010).

adaptive agents (which could mean anything from investors in a market, to organisms in an ecosystem, to cells within an organism) can evolve into increasingly intricate and dynamically changing adaptive systems.¹³¹ The ability of agents to adapt to the changes in the system, including those caused by the interaction of the agents, leads the overall system—the market, ecosystem, or organism—to develop in nonlinear ways.¹³²

Economists have looked at how a financial market represents a complex adaptive system¹³³ and may therefore exhibit nonlinear behavior¹³⁴ and suffer bouts of disequilibrium and unpredictable swings.¹³⁵ Accordingly, models of market risk may suffer spectacular failures.¹³⁶

If a financial market is a complex adaptive system, then so too is a regulated financial market. The agents in the system are financial market traders and the regulators looking to govern the risk-taking of those traders. As regulators set rules for the market, the traders (with the help of their lawyers) find ways to adapt around these rules or to move capital to a less regulated part of the system. The co-evolution of financial regulation and regulatory arbitrage provides an example of what scholars of complex adaptive systems call “emergence.” Legal scholar J.B. Ruhl defines emergence as:

[T]he appearance of unforeseen qualities from the self-organizing interaction of large numbers of objects, which cannot be understood through study of any one of the objects. The key to emergence is understanding that the emergent behaviors of dynamical systems are high-level patterns arising from the indescribably complex interaction of lower-level subsystems. Hence, removing or otherwise changing any interacting

131. Complex adaptive systems are systems in which multiple independent agents interact with one another. The capacity of the agents to adapt to changes in the system causes the system to evolve into progressively more complex forms and to change in a non-linear manner. Simon A. Levin, *Complex Adaptive Systems: Exploring the Known, Unknown and the Unknowable*, 40 BULL. AM. MATH. SOC'Y 3, 4 (2002) (defining complex adaptive systems).

132. *Id.*

133. See, e.g., Cars H. Hommes, *Financial Markets as Nonlinear Adaptive Evolutionary Systems*, 1 QUANTITATIVE FIN. 149 (2001).

134. Risk models or regulations that rely on linear causality falter when applied to complex adaptive systems. Professor J.B. Ruhl has written extensively on the failures of law to manage non-linear causality. See J.B. Ruhl, *Thinking of Environmental Law as a Complex Adaptive System: How to Clean Up the Environment by Making a Mess of Environmental Law*, 34 HOUS. L. REV. 933, 979 (1997) (criticizing environmental statutes for this flaw).

135. John Foster, *From Simplistic to Complex Systems in Economics*, 29 CAMBRIDGE J. ECON. 873 (2005). Many complex, adaptive systems may tend towards disequilibrium because of the concept of emergence, which is described *supra* note 132. Ruhl, *supra* note 134, at 990–91.

136. See generally Alejandro Reveiz Herculano & Sebastian Rojas, *The Case for Active Management from the Perspective of Complexity Theory*, 495 BORRADORES DE ECONOMÍA 11 (2008), <http://www.banrep.gov.co/docum/ftp/borra495.pdf> [<https://perma.cc/879D-8NU5>]; cf. CARLO C. JAEGER ET AL., RISK, UNCERTAINTY AND RATIONAL ACTION (2001). Legal scholars have analyzed how individuals severely underestimate risk when confronted with complex adaptive systems. E.g., Lawrence A. Cunningham, *Too Big to Fail: Moral Hazard in Auditing and the Need to Restructure the Industry Before it Unravels*, 106 COLUM. L. REV. 1698, 1724–26 (2006) (discussing accounting firms' underestimation of their legal exposure); see also Lawrence A. Cunningham, *From Random Walks to Chaotic Crashes*, 62 GEO. WASH. L. REV. 546 (1994).

component of the system potentially changes the entire system since the interactions leading to the global emergent behaviors may no longer be possible.¹³⁷

Emergence and the complex interactions of agents on the micro level frustrate the prediction of changes to the overall system.¹³⁸

One could analogize the complex adaptive system of a regulated financial market to a petri dish in which traders and regulators adapt to one another. This interaction may make predictions about the stability of financial markets and regulation hard enough in normal times. Asset price bubbles place that petri dish under a heat lamp. The heat creates the conditions for frenzies of regulatory arbitrage that destabilize the architecture of financial regulation.¹³⁹

B. The Inherent Instability of Capital Regulations

The system tends toward complexity and capital regulations tend to be unstable because of the congenital incentives of financial firms to increase leverage. As noted in Part III above, those incentives stem not merely from the moral hazard created by government guarantees, explicit and implicit, of banks and their creditors, but moreover from the fundamental market failure those guarantees aim to remedy: the externalities that banks threaten to impose on the wider economy when they fail. These potentially severe externalities mean governments feel compelled to backstop banks and their creditors, which creates an incentive for banks to over-lever, take excessive risk and find ways around capital requirements. These externalities threaten to destabilize not only capital rules, but a spectrum of prudential regulations that limit bank risk-taking and mitigate systemic risk. These externalities have also sparked a scholarly gold rush to identify the conditions that created the “Quiet Period,” the decades between the end of the Second World War and the 1970s in which the architecture of financial institution regulation remained remarkably stable and few firms sought to engage in massive and sustained regulatory arbitrage of the rules of the game.¹⁴⁰

137. J.B. Ruhl, *Complexity Theory as a Paradigm for the Dynamical Law-And-Society System: A Wake-Up Call for Legal Reductionism and the Modern Administrative State*, 45 DUKE L.J. 849, 877–78 (1996) (internal quotations omitted).

138. *See id.*

139. GERDING, LAW, BUBBLES, AND FINANCIAL REGULATION, *supra* note 20, at 240–47 (describing how dynamics of bubbles promote conditions for regulatory arbitrage of financial regulations that restrict lending and investment).

140. *E.g.*, Prasad Krishnamurthy, *Regulating through Rents* (unpublished manuscript) (on file with the author); *see generally* GARY B. GORTON, *SLAPPED BY THE INVISIBLE HAND: THE PANIC OF 2007* 54–55 (2010) (providing explanation for the Quiet Period); GARY B. GORTON, *MISUNDERSTANDING FINANCIAL CRISES: WHY WE DIDN’T SEE ONE COMING* 10–28, 125–33 (2012) (defining historical characteristics of a “Quiet Period” in banking system, and analyzing conditions leading to post-war “Quiet Period”).

C. Solutions

Unless and until those conditions can be identified and recreated, policymakers must cobble together responses to the continuously evolving threat that regulatory capital arbitrage poses to bank capital regulations and that regulatory arbitrage more generally poses to any prudential, systemic-risk reducing regulation. Conceptually, policymakers can proceed down one of two broad avenues.

1. Simple: Dogs and Frisbees

First, regulators can address the threat of regulatory capital arbitrage with broad simple rule structures that might be labelled (affectionately or not) as “stone axe.” For example, Professors Admati and Hellwig argue for relatively simple leverage caps that are fixed at very high levels.¹⁴¹ High capital would not only absorb more bank losses, it would also compensate for some erosion of legal rules by regulatory arbitrage. As noted above, Heidi Mandanis Schooner adds a procedural, yet still elegant twist to this reform proposal. She argues for a presumption of high capital requirements for all banks, which an individual bank might convince a regulator to lower with sufficient evidence that the bank’s risk profile is small.¹⁴²

Professor Schooner’s elegant approach might be taken several steps further. Policymakers might use presumptions in a host of ways to address regulatory capital arbitrage. For example, new financial instruments or complex financing transactions might be presumptively off limits for a bank absent it demonstrating to regulators that these innovations do not pose a risk to the bank or to the financial system. A bank might also have to show that a complex financing transaction has economic substance beyond gaming regulations. Regulators might sunset approvals of financial innovations or automatically reset capital rules to high levels unless a bank can periodically produce evidence that a complex instrument or transaction continues to be low risk and have economic substance. This type of presumption meshes with a wave of scholarship that calls for greater use of licensing regimes in financial regulation.¹⁴³

There is quite a bit of intellectual heft behind simple rules. For example, Andrew Haldane, in his famous “Dog and the Frisbee”

141. ADMATI & HELLWIG, *supra* note 1.

142. Schooner, *supra* note 7.

143. Eric A. Posner & E. Glen Weyl, *An FDA for Financial Innovation: Applying the Insurable Interest Doctrine to Twenty-First-Century Financial Markets*, 107 NW. U. L. REV. 1307 (2015); Saule T. Omarova, *License to Deal: Mandatory Approval of Complex Financial Products*, 90 WASH. U. L. REV. 63 (2012). See also Oren Bar-Gill & Elizabeth Warren, *Making Credit Safer*, 157 U. PA. L. REV. 1 (2008).

speech,¹⁴⁴ makes a strong case for simple regulatory approaches to the complex problems of modern financial institutions and markets. Simple rules have several virtues. They do not overtax the cognitive abilities and institutional capacities of regulators. Regulators are less prone to behavioral biases and other cognitive errors when implementing and enforcing simple rules.¹⁴⁵ Simple rules also have political virtues. They are easier to understand, explain, justify to the public, and defend publicly, and they make it easier to monitor regulator behavior.

However, simple, blunt rules have drawbacks. Simple but much higher capital requirements invite financial institutions to find ways to load their balance sheet with riskier assets. Moreover, if capital requirements are sufficiently high, they encourage investors to move their money away from regulated banks to less regulated competitors. These competitors could make investments more freely and offer their shareholders the possibility of the turbocharged returns that come with leverage. This sort of investment switching can be seen in the rise of money market mutual funds in the 1970s. Those funds attracted investors away from banks who could offer only regulation-capped interest rates on deposits.¹⁴⁶ The concern with investment switching and regulatory arbitrage is voiced by critics who argue that increased regulation will drive finance further into the less regulated “shadows.”¹⁴⁷ There are many reasons not to take this argument at face value: not least because banks and regulated entities have been key enablers of the shadow banking system.¹⁴⁸ Nevertheless, higher bank capital requirements will create strong incentives for banks to engage in regulatory capital arbitrage,¹⁴⁹ including strategies employing less-regulated affiliates.¹⁵⁰ Regulation might then need to address capital flows into parallel financial systems that are less regulated than depository banking but perform the same economic functions and threaten the same systemic risk spillover effects.

144. Andrew G. Haldane, Executive Director, Financial Stability, Bank of England, & Vasileios Madouros, Economist, Bank of England, Remarks at the Federal Reserve Bank of Kansas City's 366th economic policy symposium, “The Changing Policy Landscape,” Jackson Hole, WY (Aug. 31, 2012) <http://www.bis.org/review/r120905a.pdf> [<https://perma.cc/T7K6-6DDH>].

145. *Id.*

146. William A. Birdthistle, *Breaking Bucks in Money Market Funds*, 2010 WIS. L. REV. 1155.

147. *E.g.*, Gary Gorton et al., *The Safe-Asset Share*, 102 AMER. ECON. REV. 101 (2012).

148. Erik F. Gerding, *The Shadow Banking System and its Legal Origins*, (Jan. 24, 2012) (unpublished manuscript) (available for download at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1990816 [<https://perma.cc/56XQ-ZVSB>]).

149. GERDING, LAW, BUBBLES, AND FINANCIAL REGULATION, *supra* note 20.

150. See Saule T. Omarova, *From Gramm-Leach-Bliley to Dodd-Frank; the Unfulfilled Promise of Section 23A of the Federal Reserve Act*, 89 N.C. L. REV. 1683 (2011) (detailing strategies by bank holding companies to transfer subsidies from bank subsidiaries to less regulated affiliates).

2. High Tech: Adaptive Regulations and Adaptive Regulators

The alternative to simple rules is a complex or “high tech” approach to regulatory capital arbitrage. Regulators could attempt to match the complex and adaptive nature of regulatory capital arbitrage with increasingly complex and adaptive rules. Regulators could seek to adjust capital regulations continuously and dynamically to adapt to evolutions in bank risk-taking and trading strategies, as well as other financial innovations.

A dynamic, adaptive regulatory approach requires dynamic and adaptive regulators. This, in turn, requires that regulators will have the legal authority, the incentives, and the capacities—both cognitive and institutional—to keep pace with industry. Legal scholarship has only begun to consider the institutional design questions that are central to endowing regulators with this type of authority, incentives, and capacities. On the bright side, scholars have already proposed creative mechanisms. For example, Brett McDonnell and Dan Schwarcz advocate for an institutional system of “regulatory contrarians” or gadflies operating within regulatory agencies that would push for new regulations.¹⁵¹ Eric Posner argues that cost-benefit analysis of capital regulations, if properly done, might produce results that force regulators to raise capital.¹⁵² Although this last proposal presupposes that regulators would act within an institutional environment that gives them the requisite incentives and resources and immunizes them from political pressures and cognitive errors.¹⁵³ I have proposed elsewhere a range of institutional mechanisms to make financial regulators more proactive, including the following: countercyclical regulator budgets; think tanks, graduate colleges and policy planning staffs within agencies; and greater use of regulatory peer review systems.¹⁵⁴

Yet all of these mechanisms might improve regulation even if policymakers adopt simple approaches to regulatory capital arbitrage. A mix of simple rules and smart financial regulators might yield the best results against the formidable foe of regulatory arbitrage.

151. Brett McDonnell & Daniel Schwarcz, *Regulatory Contrarians*, 89 N.C. L. Rev. 1629 (2011).

152. Posner, *supra* note 5.

153. Erik F. Gerding, *Cost-Benefit Analysis as a Spur to Regulate: On Eric Posner’s “How Do Bank Regulators Determine Capital-Adequacy Requirements?”*, 83 U. CHI. L. REV. ONLINE __ (forthcoming 2016).

154. GERDING, *supra* note 20, at 508–09.