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A New Philosophy For Financial Stability Regulation

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The financial crisis of 2007-2008 showed up many inadequacies in the pre-crisis approach to financial stability regulation. In the United States, the response has been to enact the Dodd-Frank Wall Street Reform and Consumer Protection Act, which calls for regulatory agencies to make numerous rules regulating activities that have the potential to harm financial stability. However, there has been no real effort to rethink how these rules should be assessed. The cost-benefit analysis standard used to evaluate financial stability regulation prior to the crisis persists today, and both the courts and Congress have sought to further entrench that standard. However, because cost-benefit analysis gives too much primacy to the short-term interests of the financial industry and too little to financial stability, this Article rejects cost-benefit analysis and develops a substitute precautionary standard for assessing financial stability regulation, drawing analogies from the literature on the use of the precautionary principle in regulating complex environmental systems. A precautionary approach is more responsive than cost-benefit analysis to the complexity and fragility of the financial system, directing financial regulators to err on the side of caution and to prioritize the stability of the financial system over the short-term profitability of the financial sector.

This Article also considers a practical framework for precautionary review of innovative financial products, as a concrete illustration of how the precautionary approach might be operationalized. The key practical implication of such an approach is that it will shift the regulatory burden to the financial industry to demonstrate why regulation of a new product is unnecessary. *As this Article demonstrates, this burden-shifting entails many benefits, including mitigating issues of regulatory capture and collective action problems, and remediating limits on regulatory funding and expertise.*

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1. INTRODUCTION

The financial crisis of 2007-2008 (the "Financial Crisis") was a cataclysmic social event: "[s]eventeen trillion dollars in household wealth evaporated [largely as a result of falling housing and stock prices] within 21 months, and reported unemployment hit 10.1% at its peak in October 2009," resulting in widespread bankruptcies and mortgage foreclosures.[2] The severity of this Crisis can be attributed to thirty years of financial deregulation in the United States:[3] convinced of the efficiency, rationality and self-correcting nature of the financial markets, policymakers had allowed protective regulation of those markets to be stripped away, so that when a (somewhat) unexpected shock came in the form of the failure of the subprime mortgage market, that shock reverberated into every crevice of the financial system, and unprecedented governmental intervention was required to stave off complete economic collapse.[4] The Financial Crisis thus spurred a renewed recognition of the need for government involvement in the financial markets, which culminated in the enactment of the Dodd-Frank Wall Street Reform and Consumer Protection Act[5] ("Dodd-Frank").

Dodd-Frank is described as an Act "To promote the financial stability of the United States", and reflects a consensus that regulation of financial institutions and markets is necessary to preserve the stability of the

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[2] FINANCIAL CRISIS INQUIRY COMMISSION, THE FINANCIAL CRISIS INQUIRY REPORT, 389 (2011) (hereinafter, the "FCIC Report").

[3] "More than 30 years of deregulation and reliance on self-regulation by financial institutions . . . had stripped away key safeguards, which could have helped avoid catastrophe." *Id*. at xviii.

[4] DAVID M. DRIESEN, THE ECONOMIC DYNAMICS OF LAW, 36 (2012).

[5] Pub. L. No. 111-203, 124 Stat. 1376 (2010).

financial system. Perhaps the most controversial financial stability provision included in Dodd-Frank is Section 619, known colloquially as the "Volcker Rule". Broadly speaking, the Volcker Rule seeks to ban proprietary trading by banks so as to stop them from making risky bets with taxpayer-guaranteed funds.[6] However, despite the fact that Dodd-Frank was passed in 2010, we still don't know all of the contours of the Volcker Rule's prohibitions (or the details of many of Dodd-Frank's other financial stability provisions, for that matter). This is because Congress left much of the detail of Dodd-Frank to be embodied in administrative regulations promulgated by financial regulatory agencies, and many of these regulations have yet to be finalized. Partly, this delay is due to the sheer volume of rulemaking required of the financial regulatory agencies by Dodd-Frank, but it is also a result of regulators girding for future administrative law challenges by engaging in painstaking consultation with industry over the intricacies of their rulemaking. Despite the depth of this consultation, however, it is expected that the regulations fleshing out the Volcker Rule will be subject to industry attack once they are finalized.[7]

In recent years, the financial industry's weapon of choice in attacking administrative rulemakings has been to challenge them in the D.C. Circuit as arbitrary and capricious, on the grounds that the rules' quantifiable benefits do not exceed their costs.[8] While there is currently no law that specifies that rules made by financial regulatory agencies must satisfy this strict cost-benefit analysis standard,[9] two bills introduced in the

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[6] This provision restricts banks' ability to engage in proprietary trading because of the fear that, should a large and interconnected financial institution fail as a result of outsize risks taken as part of proprietary trading activities, the consequences of that failure – being either a bailout, or systemic instability – would be borne by society at large. Simon Johnson, *Will There Be a Meaningful Volcker Rule*, N.Y. TIMES (June 7, 2012) (available at http://economix.blogs.nytimes.com/2012/06/07/will-there-be-a-meaningful-volcker-rule/)

[7] Ben Protess, *Volcker Rule Divides Regulators*, N.Y. TIMES, Oct 16, 2011 (available at http://dealbook.nytimes.com/2011/10/16/volcker-rule-divides-regulators/?ref=business).

[8] Cost-benefit analysis can encompass a spectrum of methodologies, ranging from this more rigid cost-benefit approach, which would seek "to ensure that all regulatory statutes are implemented by reference to the principle of economic efficiency based on the criterion of private willingness to pay", to a more lax version that could be viewed as "an effort to require balancing rather than absolutism". Cass R. Sunstein, *Congress, Constitutional Moments, and the Cost-Benefit State*, 48 STAN. L. REV. 247, 253 (1995-1996). For the purposes of this Article, the key unifying feature of the cost-benefit methodologies that are being critiqued is the requirement that the *quantifiable* benefits of regulation *demonstrably* outweigh the costs.

[9] Many non-financial regulatory agencies are subject to the stringent cost-benefit analysis requirements set out in Executive Orders 12,866 and 13,563. However, the independent regulatory agencies listed in 44 U.S.C. 3502 (which include the FRB, the FDIC, the CFTC and the SEC) are excluded from the ambit of Executive Order 12,866 by operation of Section 3(b) of that Order. Some individual financial regulatory agencies are subject to (non-homogenous) statutory requirements to consider the economic costs of their regulations, but these do not require strict empirical cost-benefit analysis. For example, the CFTC is required by statute to consider the costs and benefits of its rules before it issues them (7 U.S.C. § 19(a)). The SEC must consider the impacts of its rules on efficiency,

Senate last session aimed to implement such a requirement,[10] and even in the absence of such a law, the D.C. Circuit has handed down a string of decisions that strike down administrative rulemakings as arbitrary and capricious because of their failure "adequately to assess the economic effects of a new rule".[11] Unfortunately, because of the difficulties inherent in providing hard empirical evidence of the benefits of financial stability rules, such rules (including those implementing the Volcker Rule) are unlikely to be able to withstand the application of a cost-benefit analysis standard of review, and are thus likely to be invalidated if challenged.

The difficulties in quantifying the benefits of financial stability rules arise because it is difficult to prove that such rules will succeed. It is also difficult to determine how likely a financial crisis would be to occur in the absence of any such rules, and virtually impossible to predict the depth of social harm that such crisis would inflict:[12] it thus seems impossible to put a

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competition and capital formation (15 U.S.C. §§ 78c(f), 78w(a)(2)). For a comprehensive discussion of requirements for the SEC to perform economic analysis of its rules, see Edward Sherwin, *The Cost-Benefit Analysis of Financial Regulation: Lessons from the SEC's Stalled Mutual Fund Reform Effort,* 12 Stan. J. L., Bus. & Fin. 1 (2006).

[10] In September of 2011, Senator Richard Shelby, the ranking Republican member of the Committee on Banking, Housing and Urban Affairs, introduced a bill entitled the Financial Regulatory Responsibility Act (S. 1615). That bill required rigorous cost-benefit analysis of any regulation proposed by a United States financial regulatory agency, and proposed that no regulatory action be permitted if the *quantified* benefits did not outweigh the quantitative costs of that action (unless Congress granted a waiver). S. 1615, Sections 3(a)(4); 3(a)(5); 3(b)(4)(A). In August of 2012, a bipartisan group of senators introduced a bill entitled the Independent Agency Regulatory Analysis Act of 2012 (S. 3468). This bill authorized the President to require, by Executive Order, that the financial regulatory agencies (other than the Federal Reserve) "assess the costs and the benefits of the intended rule and, recognizing some costs and benefits are difficult to quantify, propose or adopt a rule only upon a reasoned determination that the benefits of the rule justify its costs" and "base its rulemaking decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended rule." S. 3468, Sections 3(6); 3(7). For a discussion of the deregulatory potential of such legislation, *see* Ben Protess, *Lawmakers Push to Increase White House Oversight of Financial Regulators*, N.Y.TIMES (Sept. 9, 2012). Neither bill was enacted, however.

[11] Bruce Kraus and Connor Raso, *Rational Boundaries for SEC Cost-Benefit Analysis*, 1 (2012), available at http://ssrn.com/abstract=2139010.

[12] Raghuram G. Rajan, *Has Financial Development Made the World Riskier?*, FEDERAL RESERVE BANK OF KANSAS CIY SYMPOSIUM: THE GREENSPAN ERA: LESSONS FOR THE FUTURE, 313, 350 (2005). Many described the Financial Crisis as the proverbial hundred year storm, but the frequency of financial crises in the United States in the last 200 years suggests that they are much more common than that: there were significant bank panics in the United States in 1837, 1857, 1873, 1907, and of course, during the Great Depression (*see* Gorton & Metrick, *supra* Note 15, at 283). After the introduction of Federal deposit insurance in 1934, financial crises migrated outside of traditional banks: the United States saw the Savings and Loan Crisis of the 1980s and 90s, and a crisis was narrowly avoided (by a private-sector bailout) after the failure of hedge fund Long Term Capital Management in 1998 (LTCM's failure was sparked by other, international financial crises). Indeed, JPMorgan CEO Jamie Dimon testified his belief that financial crises will occur every five to seven years. Sewell Chan, *Voices That Dominate*

dollar figure on the potential benefits of financial stability regulation. In contrast, the immediate costs of taking regulatory action are usually readily apparent.[13] As such, although there is a superficial appeal to the position that agencies should be able to demonstrate empirically that their rules do more good than harm, the implementation of such a standard of review for financial stability regulation effectively signals a return to deregulation, and it should be resisted. Instead, we need a new standard for evaluating financial stability regulation. This new standard of review must recognize that the interconnections between financial actors and products are so complex and unpredictable that regulators can never be certain how successful their efforts to avoid crises will be. The standard must recognize that if regulators are successful in their regulatory efforts, there will never be any proof of that success because we will never know how severe financial crises might have been in the absence of regulation. And arguably most importantly, the standard must recognize that the financial system is not an end in itself, but rather exists as an auxiliary system for the broader economy: the avoidance of the catastrophic social costs of economic failure needs to be prioritized over the short-term profitability of financial institutions.

Fortunately, there is precedent for a regulatory approach that addresses these types of concerns. Environmental regulators must also grapple with complex and unpredictable systems, with potentially dire and irreversible social consequences if regulation is wrong and no validation if regulation is right. In response to these challenges, some environmental policymakers and academics have decided that an alternative to cost-benefit analysis is required, and developed an approach known as the "precautionary principle", which is essentially a way of thinking about regulation that errs on the side of protective regulation when the outcome of an activity is uncertain, but potentially irreversible and catastrophic.[14] This is the approach that should inform financial stability regulation in the United States.

The remainder of this Article proceeds as follows: Section 2 starts by providing a working definition of "financial stability regulation", and explains why such regulation is so necessary and important. Section 2 will also demonstrate that strict cost-benefit analysis is incompatible with this type of regulation, because it focuses regulatory attention on readily observable financial industry compliance costs, and discourages implementation of regulation if those costs are not outweighed by

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Wall Street Take a Meeker Tone on Capitol Hill, N.Y. Times (January 13, 2010) (available at http://www.nytimes.com/2010/01/14/business/14panel.html)

[13] See text accompanying Notes 66-67.

[14] Douglas A. Kysar, *Ecologic: Nanotechnology, Environmental Assurance Bonding and Symmetric Humility*, 28 UCLA J. Envtl. L. & Pol'y 201, 203 (2010); David A. Dana, *A Behavioral Economic Defense of the Precautionary Principle*, 97 NW. U. L. REV. 1315, 1315-1316 (2002-2003).

quantifiable and demonstrable benefits. As Section 3 will explore, adopting a precautionary approach to financial stability is an antidote to such a short-sighted, deregulatory agenda. In addition to prompting regulators to look more broadly at longer-term risks within the system, requiring a precautionary approach to financial stability regulation can have ancillary benefits. Notably, the precautionary approach advocated in this Article would shift the "regulatory burden of proof" so that regulated entities are required to demonstrate why regulation of their activities is *unnecessary*, instead of requiring regulators to affirmatively demonstrate the benefits of regulating before they can do so. Inverting the regulatory paradigm in this way would force the financial industry to internalize some of the costs of regulating for financial stability. Such an inversion of the onus is also likely to mitigate collective action problems, and the cognitive capture of financial regulators by their regulated industry. Precautionary regulation is thus better calculated to protect the broad societal interest in preserving financial stability.

This Article does not seek to provide a detailed framework for operationalizing the precautionary principle – the majority of the article speaks only in general terms about the precautionary approach financial regulators should take when regulating financial institution activities. However, to ground this in a more concrete context, Section 4 will focus on the hot-button issue of financial innovation as a testing ground for a precautionary approach to financial regulation.[15] Some prominent examples

[15] As the term is used in this Article, "financial innovation" encompasses new types of financial instruments created using advances in technology and financial theory. By way of example, some of the key financial instrument innovations of the last three decades include interests in money market funds, indexed mutual funds and exchange traded funds; treasury inflation protection securities; asset-backed securities; collateralized debt obligations; interest rate swaps; currency swaps; and credit default swaps. *See* Robert E. Litan, *In Defense of Much, But Not All, Financial Innovation*, Brookings Institution Research Paper, 16-43 (February 17, 2010) (available at http://www.brookings.edu/research/papers/2010/02/17-financial-innovation-litan).
Gennaioli et al. emphasize that in the innovation process, financial engineering (including diversification, tranching, and insurance techniques) is often used to carve new types of financial instruments out of existing types of instruments. Nicola Gennaioli, Andrei Shleifer and Robert Vishny, *Financial Innovation and Financial Fragility*, FONDAZIONE ENI ENRICO MATTEI NOTA DI LAVORO 114.2010, 2 (May, 2010). New financial instruments can often be characterized alternatively as either a new type of financial instrument or as a new use of an existing instrument, and it is difficult to demarcate the point at which a new use of an existing instrument becomes a *sui generis* new instrument. (Take a CDS, for example: banks could characterize it as the sum of its building blocks (a new application (i.e. to credit) of a non-exchange traded bilateral forward contract) rather than as a stand-alone product. *See* Henry T.C. Hu, *Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism*, 102 YALE L.J. 1457, 1467 (1992-1993)). As such, this Article also considers new uses of exiting instruments to be financial innovation.
The term "financial innovation" can also encompass the evolution of new types of financial intermediaries (such as hedge funds and private equity funds). Litan at 16-43. This Article will focus on the innovation of new instruments, but this focus by no means discounts the

of recent financial innovations, which will be used for illustrative purposes throughout Section 4, are credit default swaps ("CDSs") and mortgage-backed securities ("MBSs"). Both of these innovations were lionized prior to the Financial Crisis, and demonized thereafter – in reality, as is often the case, these innovations are neither wholly good nor wholly bad. Many of the problems associated with CDSs and MBSs derived from improper use and overuse – financial regulation could have checked this in the lead up to the Financial Crisis, but regulators were coopted by industry enthusiasm for these products.[16] This type of groupthink was particularly effective in preserving the non-regulated status quo prior to the Financial Crisis,[17] but a precautionary approach would invert this status quo so that the default position for regulators would be to regulate financial innovation.

In March of 2011, the IMF held an illuminating research conference entitled "Macro and Growth Policies in the Wake of the Crisis." One of the panelists, Dr. Y. V. Reddy, former Governor of the Bank of India, made the following remarks about financial innovation:

> "*A regulator has a job to try to understand innovation and regulate it, but it doesn't mean that the innovator has the right to introduce the innovation in the market . . . if I can't understand [it] I won't permit it until you make me understand, or until you redesign it in a way that we can understand. . . regulation has to keep on moving ahead, but where does the burden of proof lie, and where does the risk lie?*"[18]

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effect of the evolution of new types of financial intermediaries (sometimes referred to as the shadow banking industry) on financial stability – for further discussion of the evolution of the shadow banking industry, *see* Gary Gorton and Andrew Metrick, *Regulating the Shadow Banking System*, (available at http://ssrn.com/abstract=1676947).

[16] "Like the bankers themselves, the regulators believed that these innovations were making financial intermediation safer and more efficient." Arnold Kling, *The Financial Crisis: Moral Failure or Cognitive Failure?,* 33 HARV. J. L. & PUB. POL'Y 507, 515 (2010).

[17] "There is little room for doubt, in my view, that the Fed under Greenspan treated the stability, well-being and profitability of the financial sector as an objective in its own right, regardless of whether this contributed to the Fed's legal macroeconomic mandate of maximum employment and stable prices or to its financial stability mandate. Although the Bernanke Fed has but a short track record . . . it also may have a distorted and exaggerated view of the importance of financial sector comfort for macroeconomic stability." Willem H. Buiter, *Central Banks and Financial Crises*, FEDERAL RESERVE BANK OF KANSAS CIY SYMPOSIUM: MAINTAINING STABILITY IN A CHANGING FINANCIAL SYSTEM, 495, 602 (2008). McDonnell & Schwarcz note that "overconfidence, confirmation bias, and groupthink at least contributed to push the laissez-faire inclinations of the Federal Reserve toward excessive disregard of newly emerging systemic and prudential risks." Brett McDonnell & Daniel Schwarcz, *Regulatory Contrarians*, 89 N.C. L. REV. 1629, 1639 (2011).

[18] Dr Y. V. Reddy made his comments during a panel discussion entitled "Financial Intermediation and Regulation," during which the panelists debated the social utility of financial innovation and the appropriate response of financial regulation to innovation (this panel can be viewed at

Shifting the burden of proof to regulated financial institutions seems anathema to the regulatory philosophy that currently prevails in the United States: the prevailing wisdom here is that markets, rather than regulators, should decide whether a financial innovation should gain traction in the markets.[19] However, as this Article will explore, Reddy's precautionary view is a necessary ingredient of effective financial stability regulation.

2. FINANCIAL STABILITY REGULATION

A. Rationale For Financial Stability Regulation

In the three decades leading up to the Financial Crisis, increasing faith was placed in the ability of the financial system to work efficiently, without any need for regulatory intervention.[20] However, that faith was abruptly shattered with the fall of Lehman Brothers in September 2008, when it became abundantly clear that government intervention was needed to prevent the total collapse of the financial system. Thus, in the wake of the Financial Crisis, renewed attention has been paid to "financial stability regulation",[21] being regulation that is targeted at the activities of financial

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http://www.imf.org/external/mmedia/view.aspx?vid=817505940001. Dr Reddy made this statement approximately 35 minutes into the discussion).

[19] Traditionally, financial regulators have shied away from making broad judgments about whether a financial product should be allowed or not (this is often referred to as "merit regulation"). *See* Litan, *supra* Note 15 at 45. The preferred method of protecting investors from bad investment choices has traditionally been disclosure: information about products should be made freely available to those considering whether to acquire/use those products, and then they should be free to make up their own mind about the product without an agency imposing its imprimatur on that product. The adequacy of disclosure-based regulation as it applies to individual investors is a fascinating issue, but one that is beyond the scope of this Article. For further discussion, see Cass R. Sunstein, *Informational Regulation and Informational Standing: Akins and Beyond*, 147 U. PA. L. REV 613 (1999); Steven L Schwarcz, *Disclosure's Failure in the Subprime Mortgage Crisis*, 2008 UTAH L. REV. 1109 (2008). However, disclosure to individual investors does not in any way address the systemic risk posed by financial products: informing an individual about the personal risks to which they are subject to will not lead them to take action so as to protect the operation of the financial system more broadly. Stephen L. Schwarcz, *Systemic Risk*, 97 GEO. L. J. 193, 218 (2008-2009) (hereinafter, "Systemic Risk"). In fact, complex disclosure relating to complex products may actually increase uncertainty about what a financial product is worth, thus encouraging systemic panic in a crisis situation. "The fact that disclosure has become so complex that investors are uncertain how much securities are worth increases the perception, if not reality, of risk." Steven L. Schwarcz, *Regulating Complexity in Financial Markets*, 87 WASH. U. L. REV. 211, 255 (2009) [hereinafter, *Regulating Complexity*].

[20] Driesen, *supra* Note 4, at 36-37.

[21] In the United States, an alphabet soup of financial regulators (including the Board of Governors of the Federal Reserve System, the SEC, the CFTC and the FDIC) have been directed by Dodd-Frank to consider financial stability issues in their rulemaking activities. With regard to the Board of Governors of the Federal Reserve System, see, for example, Dodd-Frank Sections 161, 162, 163, 165, 166, 167, 607, 802, 805, 807, 808 and 1104. With regard to the FDIC, see, for example, Dodd-Frank Sections 203, 206 and 210. The

institutions with the aim of preventing such institutions (and markets generally) from collapsing in a way that damages the broader economy.[22] Financial stability regulation encompasses a broad range of measures implemented by Dodd-Frank, including regulatory capital requirements for banks, mandatory clearing of certain financial derivative instruments, and the Volcker Rule.[23] In the future, financial stability regulation may also come to encompass new proposals to maintain the stability of the financial system, such as the measures to regulate financial innovation discussed in Section 4.

To appreciate the importance of financial stability regulation, one must understand the linkages between the financial system and the real economy. The primary function of the financial system is to intermediate capital – that is, to connect those who want to earn a return on money with those who need money for productive purposes and are willing to pay for such money.[24] Capital intermediation often takes the form of the provision of credit, and that credit is key to the growth of the broader economy: new businesses cannot start and existing businesses cannot expand without it.[25] Because the financial system is the primary provider of credit and other capital intermediation,[26] a financial crisis impacts the access of the broader

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CFTC and the SEC have been charged with considering financial stability issues when determining whether someone is a "major swap participant" or a "major security-based swap participant." See Dodd-Frank Sections 721 and 761, respectively. All of these agencies have been directed to consider financial stability in devising the rules implementing the Volcker Rule.

[22] William A. Allen and Geoffrey Wood, *Defining and Achieving Financial Stability*, 2 JOURNAL OF FINANCIAL STABILITY 152 (2006). The Dodd-Frank legislation enacted in the wake of the Financial Crisis expressly acknowledges the desirability of maintaining stability – it is described as an Act "[t]o promote the financial stability of the United States", but Dodd-Frank includes no concrete definitions of the term "financial stability" or "financial stability regulation."

[23] See Section 171, Title VII and Section 619 of Dodd-Frank, respectively.

[24] "The *primary* function of any financial system is to facilitate the allocation and deployment of economic resources, both spatially and temporally, in an uncertain environment." Robert C. Merton, *A Functional Perspective of Financial Intermediation*, 24(2) FINANCIAL MANAGEMENT, 23, 23. *See also*, Litan, *supra* Note 15 at 2; Manuel A. Utset, *Complex Financial Institutions and Systemic* Risk, 45 GA. L. REV. 779, 787 (2010-2011).

[25] Restrictions on lending following a crisis are disproportionately likely to affect small and medium businesses. CARMEN M. REINHART & KENNETH S. ROGOFF, THIS TIME IS DIFFERENT: EIGHT CENTURIES OF FINANCIAL FOLLY, 146-147 (2009).

[26] Banks are the "backup source of liquidity to all other institutions, financial and nonfinancial." E. Gerald Corrigan, *Summary of* Are Banks Special?, FED. RES. BANK OF MINNEAPOLIS (Jan 1, 1983) (available at http://www.minneapolisfed.org/publications_papers/pub_display.cfm?id=684). "Banks enable people to borrow money, and, today, by operating electronic-transfer systems, they allow commerce to take place without notes and coins changing hands. They also play a critical role in channeling savings into productive investments. . . many businesses rely on the banks to fund their day-to-day operations" John Cassidy, *What Good is Wall Street?*, THE NEW YORKER (November 29, 2010) (available http://www.newyorker.com/reporting/2010/11/29/101129fa_fact_cassidy?currentPage=all).

economy to credit and in turn, economic growth.[27] A crisis will also impede the ability of the financial system to perform its other socially useful activities, including the management of risk, the elucidation and dissemination of information about companies, and the provision of a system for payments.[28] The precarious economic climate that lingered after the Financial Crisis[29] is an uncomfortably salient illustration of what happens to the growth of the real economy when the stability of the financial system is compromised by a financial crisis.[30]

In an ideal world, financial institutions would carry on their activities in ways that minimize the risk they pose to the stability of the financial system, and thus the broader economy. However, individual financial institutions have little incentive to preserve financial stability, because the benefits of such stability accrue to society as a whole and are hard for individual financial institutions to appropriate[31] (in this sense, financial stability can be conceived of as a classic positive externality. Equally, financial instability affects society as a whole and thus can be conceived of as a negative externality resulting from the activities of financial institutions).[32] Not only do financial institutions lack incentives to reduce the amount of risk in the financial system, they also lack the information and

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[27] During the Financial Crisis, the problems on Wall Street began to affect other sectors of the economy when businesses and local governments were no longer able to obtain credit. Markus K. Brunnermeier, *Deciphering the Liquidity and Credit Crunch 2007–2008*, 23 J. ECON. PERSP. 77, 90 (2009). *See* also Reinhart and Rogoff "This strong connection between financial markets and real economic activity, particularly when financial markets cease to function, is what has made so many of the crises . . . such spectacular historic events." Reinhart & Rogoff, *supra* Note 25 at xliv.

[28] Merton, *supra* Note 24 at 24. *See* Litan, *supra* Note 15 at 2; Utset, *supra* Note 24 at 788; Adair Turner, *What Do Banks Do, What Should They Do and What Public Policies Are Needed to Ensure Best Results for the Real Economy?*, Lecture at CASS Business School, (March 17, 2010) (available at http://www.fsa.gov.uk/pubs/speeches/at_17mar10.pdf) pages 2-3.

[29] "Even today, four years after the first intimations of the sub-prime mortgage debacle, high indebtedness and leverage, impaired banking capital, and a pervasive loss of confidence in a number of major financial institutions constrict an easy flow of credit to smaller businesses, potential homebuyers and consumers alike." Paul A. Volcker, *Three Years Later: Unfinished Business in Financial Reform*, The William Taylor Memorial Lecture, 5 (September 23, 2011).

[30] The type of financial crisis discussed in this Article is akin to the "banking crisis" defined by Reinhart and Rogoff: "we mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions . . . and (2) if there are no runs, the closure, merging, takeover or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions." Reinhart & Rogoff, *supra* Note 25 at 10.

[31] Hu, *supra* Note 15, at 1502.

[32] *See* Howell E. Jackson, *Variation in the Intensity of Financial Regulation: Preliminary Evidence and Potential Implications*, 24 YALE J. on REG. 253, 258 (2007); The President's Working Group on Financial Markets, *Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management* (April 1999) at page 29; Schwarcz, Systemic Risk, *supra* Note 19 at 206 (2008-2009).

tools to do so – evaluation of systemic risk requires a broad oversight of all financial institutions, and systemic risk reduction requires coordination amongst financial institutions. Individual financial institutions have limited information about their competitors' positions, and cannot force their competitors to act in certain ways: the result is that the task of overseeing and regulating financial stability cannot be carried out by the private sector, and has thus fallen to the financial regulatory agencies.[33]

B. Why a Cost-Benefit Analysis Approach to Financial Stability Regulation is Problematic

In the United States, financial regulatory agencies have the power to promulgate rules that aim to preserve financial stability.[34] These agencies are not currently required to provide empirical evidence that the benefits of such rules outweigh their costs,[35] but the agencies nonetheless tend to provide economic justifications for their rules.[36] This is in part a response to a decade-long tendency by the D.C. Circuit to invalidate agency rules that do not conform to its ideals of strict, empirical cost-benefit analysis,[37] which is itself part of the wider law and economics movement "extolling the virtues of spontaneous private ordering and expressing skepticism about government "intervention" in the marketplace . . . [leading] to a disdain for regulation."[38] But the Financial Crisis shattered faith in the perfect efficiency and self-sufficiency of markets, and Dodd-Frank reflects a new consensus that financial markets are imperfect and that regulation is necessary to preserve the stability of the financial system. Against this backdrop of renewed appreciation for regulation, the D.C. Circuit's decision

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[33] "Systemic risk regulation is an example where regulators cannot look to private regulatory strategies. Regulators cannot expect that private actors will be capable of identifying how the actions of individual firms may make the financial system less stable." Eric J. Pan, *Understanding Financial Regulation*, CARDOZO WORKING PAPER No. 329, 43 (April, 2011).

[34] See Notes 21 and 23. It should be noted, though, that these rulemaking powers can only be exercised within the limits prescribed by the Administrative Procedures Act.

[35] See Note 9.

[36] The Federal Reserve Board, for example, is subject to very few requirements to perform economic analysis of its rules. Nevertheless, the Office of Inspector General reported that "[t]he Board's General Counsel told us that the Board conducts its rulemaking activities in a manner that is generally consistent with the philosophy and principles outlined in [Executive orders imposing stringent CBA requirements on other agencies]." Office of Inspector General, *Response to a Congressional Request Regarding the Economic Analysis Associated with Specified Rulemakings*, June 2011, at pages 6-7, 9. Available at http://www.federalreserve.gov/oig/files/Congressional_Response_web.pdf. The SEC and CFTC also tend to include detailed economic analysis and consideration of costs and benefits in their rulemakings.

[37] Kraus and Raso, *supra* Note 11 at 1.

[38] Driesen, *supra* Note 4 at 3-4.

in Business Roundtable v SEC,[39] handed down in 2011, seems particularly inappropriate.[40]

The background to that decision is as follows: the Business Roundtable is a business industry association that (together with the Chamber of Commerce) sought to challenge a proxy access rule made by the SEC that "require[d] public companies to provide shareholders with information about, and their ability to vote for, shareholder-nominated candidates for the board of directors."[41] The Business Roundtable's chief argument against the rule was that the SEC "neglected both to quantify the costs companies would incur opposing shareholder nominees and to substantiate the rule's predicted benefits",[42] and that the rule was therefore arbitrary and capricious within the meaning of the Administrative Procedure Act.[43] The D.C. Circuit concurred with the Business Roundtable, and vacated the rule on the grounds that the SEC "inconsistently and opportunistically framed the costs and benefits of the rule; failed adequately to quantify the certain costs or to explain why those costs could not be quantified; neglected to support its predictive judgments."[44] Thus, the D.C. Circuit seems ready to invalidate any rule that does not provide detailed economic analysis supporting the conclusion that the rule's benefits outweigh its costs.

While the SEC's proxy access rule would not, strictly speaking, fit into this Article's working definition of financial stability regulation (it is really more of a corporate governance measure), the rule was expressly authorized by Section 971 of Dodd-Frank, and thus the D.C. Circuit's decision to invalidate the rule for inadequate cost-benefit analysis does not bode well for future challenges to rules made pursuant to Dodd-Frank that *are* related to financial stability. And it is not just the D.C. Circuit that favors this strict cost-benefit analysis standard of review: there are many prominent academics who support this approach,[45] and two bills were introduced in the Senate last session (one with bipartisan support) that aimed to entrench this stricter, empirical cost-benefit approach to financial regulation in the United States.[46] While these bills ultimately did not become law, the push for strict cost-benefit analysis review of all financial stability regulation is by no means over.

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[39] Business Roundtable v. S.E.C., 647 F.3d. 1144 (D.C. Cir. 2011).
[40] Hayden and Bodie have criticized the decision as judicial activism. Grant M. Hayden and Matthew T. Bodie, *The Bizarre Law & Economics of 'Business Roundtable v SEC'*, 38 J. CORP. L., 1,9 (2012)
[41] Business Roundtable v. S.E.C., 647 F.3d. 1144, 1146 (D.C. Cir. 2011).
[42] *Id*. at 1149.
[43] 5 U.S.C. § 706(2)(A).
[44] Business Roundtable v. S.E.C., 647 F.3d. 1144, 1148-1149 (D.C. Cir. 2011).
[45] Sunstein, Adler and Posner are perhaps its most notable proponents. Driesen, *supra* Note 4 at 25.
[46] See Note 10.

But cost-benefit analysis of financial stability regulation is inappropriate for a number of reasons. First, it encourages regulatory timidity: smaller, more detailed regulatory steps are more likely to withstand strict cost-benefit review than broad-brush rules. Unfortunately, when dealing with the complexities of the financial system, overly detailed regulation will often be ineffective[47] or, worse still, become destabilizing by adding further complexity to the environment.[48] The Volcker Rule serves as a cautionary tale here: as enacted in the Dodd-Frank legislation, the rule was a reasonably broad and precautionary legislative prohibition on proprietary trading (albeit with some exceptions). However, the efficacy of such ban is likely to be eviscerated by the overly complex implementing regulations that are being prepared with an eye to expected legal challenges from the financial industry.[49] Drafts of these implementing regulations provide incredibly detailed and prescriptive descriptions of the types of market-making and risk-mitigating hedging activities that will be permitted as exceptions to the Volcker Rule's ban on proprietary trading:[50] inevitably, some of these permitted activities will prove problematic, and as the deficiencies of the existing regulations become evident, new regulations will be incrementally layered upon the old ones to address those deficiencies. This plethora of detailed rules will add more destabilizing complexity to the financial system, as well as create incentives for regulatory arbitrage.[51]

To avoid these sorts of outcomes, instead of requiring that regulations meet a strict cost-benefit analysis standard of review, we need an alternative standard which would allow financial regulatory agencies to promulgate simpler, broader rules that are better calculated to preserve financial stability. This alternative standard needs to recognize that the benefits of financial stability regulation go beyond avoiding the immediate

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[47] "In complex environments, decision rules based on one, or a few, good reasons can trump sophisticated alternatives. Less may be more." Andrew G. Haldane and Vasileios Madouros, *The Dog and the Frisbee*, FEDERAL RESERVE BANK OF KANSAS CIY SYMPOSIUM: THE CHANGING POLICY LANDSCAPE, 5 (2012).

[48] "[T]rying to regulate a market entangled by complexity [by adding layers of protection and regulation] can lead to unintended consequences, compounding crises rather than extinguishing them because the safeguards add even more complexity, which in turn feeds more failure." RICHARD BOOKSTABBER, A DEMON OF OUR OWN DESIGN: MARKETS, HEDGE FUNDS AND THE PERILS OF FINANCIAL INNOVATION 146 (2007). *See* also J.B. Ruhl & James Salzman, *Mozart and the Red Queen: The Problem of Regulatory Accretion in the Administrative State*, 91 GEO L.J. 757 (2003).

[49] Protess, *supra* Note 7; Haldane & Madouros, *supra* Note 47 at 23.

[50] *Id.*

[51] Regulatory arbitrage has been the source of many recent financial innovations, resulting in increased complexity of the financial system. Awrey notes that "insofar as financial innovation is employed as a reflexive response to changes in the prevailing regulatory environment, both this innovation and the regulation which spawned it can be viewed as contributing to the complexity of modern financial makets." Dan Awrey, *Complexity, Innovation and the Regulation of Modern Financial Markets*, UNIVERSITY OF OXFORD LEGAL RESEARCH PAPER SERIES, PAPER No. 49/2011, page 38 (September 2011).

dollar costs of financial crises (such as government bail-outs): financial crises are destructive of confidence in the financial system, which confidence is a prerequisite for the provision of credit and a properly functioning economy.[52] A financial crisis thus becomes a broader economic crisis, and so government debt tends to explode in the wake of a financial crisis,[53] which can create political pressure to institute austerity measures with resulting broad social hardship.[54] Even without the implementation of austerity measures, the social costs that flow from financial crises are devastating:[55] the aftermath of financial crises is usually characterized by significant declines in employment,[56] and Schwarcz notes that:

> *Failure of the financial system can generate social costs in the form of widespread poverty and unemployment, which in turn can destroy lives and foster crime . . . preserving stability [of the financial system] would prevent the breakdown [of the financial system] that could lead to health and safety concerns.*[57]

But it is very difficult to put a dollar value on the benefit of avoiding these social costs of financial crises, and so a strict cost-benefit assessment of financial regulation gives short shrift to the true benefits of preserving financial stability.

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[52] Hilary J. Allen, *Cocos Can Drive Markets Cuckoo*, 16 LEWIS & CLARK L. REV. 125, 141-143 (2012). The cost-benefit approach to financial regulation has been criticized for its inability to properly quantify the benefits of investor confidence. Peter H. Huang, *Emotional Impact Analysis in Financial Regulation: Going Beyond Cost-Benefit Analysis*, (available at http://www.sss.ias.edu/files/papers/econpaper62.pdf), page 1.

[53] The economic contractions that follow a financial crisis often impose high costs on society in the form of reduced tax revenues. These costs are likely to dwarf the costs of any bailout in a financial crisis. Reinhart & Rogoff, *supra* Note 25 at 142; 224. The Congressional Budget Office has estimated that the United States incurred an additional $7 trillion in government debt as a direct result of the recession following the Financial Crisis. Cited in Simon Johnson, *Where is the Volcker Rule?*, N.Y. TIMES (December 15, 2011) (available at http://economix.blogs.nytimes.com/2011/12/15/where-is-the-volcker-rule/?ref=business).

[54] See, for example, Liz Alderman, *In Ireland, Austerity Is Praised but Painful*, N.Y. TIMES (December 5, 2011) (available at http://www.nytimes.com/2011/12/06/business/global/despite-praise-for-its-austerity-ireland-and-its-people-are-being-battered.html?_r=1&scp=4&sq=austerity&st=cse); Suzanne Daley, *Fiscal Crisis Takes Toll on Health of Greeks*, N.Y. TIMES (December 26, 2011) (available at http://www.nytimes.com/2011/12/27/world/europe/greeks-reeling-from-health-care-cutbacks.html?ref=greece); Julia Werdigier, *Young Britons Are Willing, But Few Jobs Are in Sight*, N.Y. TIMES (November 16, 2011) (available at http://www.nytimes.com/2011/11/17/business/global/britons-are-young-ready-and-willing-but-few-jobs-in-sight.html?_r=1&ref=business)

[55] Jackson, *supra* Note 32 at 288.

[56] "The unemployment rate rises an average of 7 percentage points during the down phase of the cycle, which lasts on average more than four years." Reinhart & Rogoff, *supra* Note 25 at 224.

[57] Schwarcz, Systemic Risk, *supra* Note 19 at 207.

Even if economists could agree on dollar values that represented the assumed value of avoiding or mitigating a financial crisis,[58] it is still unlikely that strict cost-benefit analysis would capture the true benefits of financial stability regulation. This is because the financial system is so complex that it is impossible to *prove* that financial stability regulation will *succeed* in avoiding or mitigating crises.[59] This complexity derives in part from the numerous actors involved in the financial system (ranging from retail depositors, to regulators, to large financial institutions – the latter of which are themselves very complex organizations),[60] the level of interconnection between those actors, and the unpredictable (sometimes even irrational) behavior of those interconnected actors.[61] In addition to the complexity surrounding the *actors* in the financial system, the different *products* in the financial system are themselves numerous, interconnected and often complex.[62] Accordingly, complexity in the financial system is

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[58] In the environmental sphere, the EPA has responded to requirements that regulation withstand strict cost-benefit analysis by developing Guidelines for Preparing Economic Analyses, which set out, *inter alia*, "guidelines for assessing the benefits of environmental policies including various techniques of valuing risk-reduction and other benefits" and "the basic theoretical approach for assessing the costs of environmental policies and describes how this can be applied in practice." U.S. Environmental Protection Agency, *Guidelines for Preparing Economic Analyses*, 1-6 (December 2010). Presumably, if financial stability regulation were to be subjected to the same stringent cost-benefit analysis requirements as environmental regulation, economists would attempt to create similar guidelines for economic analyses of financial stability regulations. It is by no means clear that such an approach would accurately capture the costs and benefits of systemic risk regulation, however: there is a broad literature criticizing this approach in the environmental area. *See*, for example, Frank Ackerman and Lisa Heinzerling, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING, 40 (2004): "In practice, most cost-benefit analyses could more accurately be described as "complete cost-incomplete benefit" studies. Most or all of the costs are readily determined market prices, but many important benefits cannot be meaningfully quantified or priced, and are therefore implicitly given a value of zero."

[59] "Unfortunately, since we do not know the probability of a potentially catastrophic meltdown of the financial sector (though it is likely to be small), it is hard to do a precise cost-benefit analysis." Rajan, *supra* Note 12 at 350. It should be noted, however, that some work is currently being undertaken to model the ability of financial regulators to reduce the risk of financial crises. See, for example, Piergiorgio Alessandri et al., *Towards a Framework for Quantifying Systemic Stability*, 5(3) INTERNATIONAL JOURNAL OF CENTRAL BANKING 47 (2009). Schwarcz has noted that these types of models might: "perceive and account for the "observable and systematic" behavioral patterns that emerge as usually diverse market segments begin moving in lockstep, or where investors exhibit herding behavior." Schwarcz, *Regulating Complexity*, *supra* Note 19 at 221-222.

[60] Utset, *supra* Note 24 at 799.

[61] "A system's complexity is thus a function of the computational and interpretive difficulty experienced by an individual in transforming raw information about its components into usable information about the system. Two things can increase the cognitive load of computing and interpreting information about a system: the number of parts or components involved; and the way that those components interact with each other." *Id*. at 798.

[62] In describing the complexity of modern investment securities, Schwarcz comments that "Complexity [of assets] derives from the intricate combining of parts, creating complications that increase the likelihood that failures will occur and diminish the ability of

exponential: it is difficult to understand the different financial actors and products because they are complex, it is harder to understand how these different actors and products are interconnected, and given the levels of unpredictability and irrationality displayed by financial actors, it is harder still to understand how they (and their products) will interact with each other – especially in a time of crisis.[63]

In such a complex system that defies predictability,[64] it is difficult for regulators to demonstrate the success of their financial stability regulations – how can a regulatory agency show that a financial crisis would have occurred *but for* its efforts?[65] Regulations implementing the Volcker Rule (and other financial stability measures) thus seem doomed to fail if evaluated on a cost-benefit analysis basis: regulators have little hope of putting a dollar figure on the "benefit" of financial stability that will derive from the implementation of the Rule.

Cost-benefit analysis instead gives primacy to what can be readily observed, replicated and quantified.[66] In the context of financial stability regulation, the one element of the cost-benefit equation that is relatively certain is the cost that financial institutions will need to bear in order to comply with that regulation. If compliance costs are given primacy because of their susceptibility to empirical analysis, then they will outweigh the more uncertain benefits of regulation: a cost-benefit analysis approach to financial stability regulation is therefore likely to favor the absence of

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investors and other market participants to anticipate and avoid these failures." Schwarcz, *Regulating Complexity*, *supra* Note 19 at 214.

[63] Market participants will make their own (rational or irrational) assessments of what is happening in the markets, and then modify their behavior accordingly. See, for example, Jeffrey M. Lipshaw, The Epistemology of the Financial Crisis: Complexity, Causation, Law, and Judgment, 19 S. CAL. INTERDISC. L.J. 299 (2009-2010) at 321-323; Schwarcz, *Regulating Complexity*, *supra* Note 19 at 238; Hu, *supra* Note 15, at 1500.

[64] Such complexities "obscure the ability of market participants to see and judge consequences" Schwarcz, *Regulating Complexity*, *supra* Note 19 at 220; 233.

[65] "Benefits from the elimination of externalities are, if anything, more difficult to measure. Systemic risks are low-probability, high-impact events. Regulatory interventions, in theory, have the potential to reduce the probability of these events and also diminish their severity. But how effective any particular intervention is on these two dimensions is difficult to tell. It requires information about a counterfactual situation: How likely is it that a systemic shock would have occurred in the absence of regulatory intervention, and how severe would the shock have been in an unregulated environment? Even ex post, the absence of systemic shocks does not provide particularly valuable information about the benefits of regulatory intervention because shocks may also not have occurred in the absence of regulation." Jackson, *supra* Note 32 at 260.

[66] "[E]conomists have a methodological preference for or bias towards building models that have as their data or inputs variables which can be objectively measured and verified," Huang, *supra* Note 52 at 47. However, "just because a risk is currently not susceptible to a defensible quantification does not, by itself, make it reasonable to ignore." Dana, *supra* Note 14 at 1319; 1338.

regulation and indicates a deregulatory philosophy.[67] Financial stability can only be addressed by regulation, however,[68] and the consequences of financial instability are potentially catastrophic.[69] As such, we need to move away from empirical cost-benefit analysis of financial stability regulation. As Calabresi noted:

> *the question of whether a given law is worth its costs . . . is rarely susceptible to empirical proof. This does not mean, of course, that the best we can do is adopt a laissez faire policy and the let the market do the best it can. It is precisely the province of good government to make guesses as to what laws are likely to be worth their costs. Hopefully it will use what empirical information is available and seek to develop empirical information which is not currently available. . . But there is no reason to assume that in the absence of conclusive information no government action is better that some action . . . in uncertainty, increase the chances of correcting an error.*[70]

3. THE PRECAUTIONARY PRINCIPLE AND FINANCIAL STABILITY REGULATION

Counterpoised as an alternative to strict cost-benefit analysis is the precautionary principle.[71] This principle is essentially a more sophisticated version of the old adage "better safe than sorry", counseling regulators to err on the side of regulating an activity when the outcome of that activity is uncertain, but potentially irreversible and catastrophic. The principle has primarily been used and discussed as a basis for environmental regulation,[72] and to date, there has been very little discussion of the principle in the context of financial regulation.[73] However, in many respects, the complex

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[67] "[S]ome other concerns about CBA of non-financial regulations, such as its potential for anti-regulatory bias . . . also may apply to CBA of securities regulations." Huang, *supra* Note 52 at 37.

[68] See text accompanying Notes 31-33.

[69] See text accompanying Notes 55-57.

[70] Guido Calabresi, *Transaction Costs, Resource Allocation, and Liability Rules – A Comment*, 11 J.L. & ECON. 67, 70 (1968).

[71] Stone, Christopher D. Stone, *Is There a Precautionary Principle?*, 31 ENVTL. L. REP. 10790, 10796 (2001).

[72] The precautionary principle has found favor in international and European environmental law. See, for example, the 1992 Rio Declaration on Environment and Development, which expressly directs nation states to embrace the precautionary principle. See also the Treaty Establishing the European Community, Nov. 10, 1997, art 174, O.J. (C340) 3 (1997), which provides that that EU environmental regulation "shall be based on the precautionary principle." Policymakers in the United States have traditionally been less enamored of the precautionary principle. Cass R. Sunstein, *Beyond the Precautionary Principle*, 151 U. PA. L. REV., 1003, 1007 (2002-2003) [hereinafter, Sunstein, *Beyond Precautionary*].

[73] A recent article by Saule Omarova includes a rare discussion of the precautionary principle in the context of financial regulation. She notes that while "[i]t is not the goal of [her] Article to advocate direct application of any particular formulation of precautionary principle to financial services regulation. Nevertheless, adopting and operationalizing the

interconnected network of actors and products in the financial system bears striking similarity to the natural environment, and financial and environmental systems share the potential for low-probability but catastrophic failures.[74] Because of these similarities, environmental law scholarship provides some useful insights that can be applied in developing a precautionary standard for financial stability regulation.

A. Similarities between Environmental and Financial Stability Regulation

Parsing through the literature on the regulation of financial systems and environmental systems, it is hard not to be struck by the similarities between the two. The financial system and environmental systems (such as coral reefs and the global climate) share similar characteristics as a result of the number and complexity of their component parts, and the feedback loops that characterize the interactions of those component parts.[75] These systems "give rise to stunningly complex and difficult to predict interactions",[76] and as a result, regulators trying to regulate these systems are to some extent working in the realm of Knightian uncertainty.[77] Complexity and unpredictability heighten regulators' "difficulty of assessing whether perceived . . . threats actually will result in harm, and if so, how much harm and . . . of assessing whether available regulatory tools and technology will in fact result in the avoidance of any harms that might otherwise result."[78] The regulatory task is further complicated because regulation of complex systems is often less concerned with the ordinary functioning of those systems, and more focused on what happens in lower-probability, higher-

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general *concept of precaution* in the context of post-crisis financial systemic risk regulation may be a worthwhile, and even necessary, exercise." Saule T. Omarova, *License to Deal: Mandatory Approval of Complex Financial Products*, page 21 (available at: http://ssrn.com/abstract=1996755). David Driesen also supports a precautionary approach to financial regulation in his book: Driesen, *supra* Note 4 at 8.

[74] For a general discussion of some of the similarities between the financial system and ecosystems, *see* Andrew G. Haldane and Robert M. May, *Systemic Risk in Banking Ecosystems*, 469 NATURE, 351 (20 January, 2011).

[75] "[I]n addition to sensitivity to minor variations in conditions, complex systems also are characterized by feedback and feedforward loops, in which system components influence other components that, in turn, cause their own effects on the original, as well as many other, components within the system." Kysar, *supra* Note 14 at 215.

[76] *Id*. at 215.

[77] Knight distinguished between situations where probabilities could be assigned to certain risks, and situations that were so uncertain that the risks were unknowable. Thus, to paraphrase Donald Rumsfeld, a situation subject to Knightian uncertainty deals with "unknown unknowns" rather than "known unknowns." *See* FRANK H. KNIGHT, RISK, UNCERTAINTY AND PROFIT 19-20 (1921).

[78] Dana, *supra* Note 14 at 1322. Kysar similarly notes that "a long recognized hallmark feature of [environmental, health and safety regulation] has been the informational and cognitive limitations that face any regulator's ability to identify, understand, and predict the consequences of risk creating activities, including the act of regulation itself." Kysar, *supra* Note 14 at 211.

impact crisis circumstances (known as "fat-tail" events),[79] when rational assumptions about the operation of complex systems and the interactions of system components are less likely to hold. If any of these financial or environmental systems do fail during fat-tail events, the consequences are likely to be irreversible[80] and catastrophic.[81]

Given this context, it is hard to put a dollar value on the benefits of regulating complex systems. With financial stability regulation, it is difficult to determine how likely a financial crisis is to occur and virtually impossible to predict its depth and potential social harm,[82] and it is also difficult to assess whether regulations aimed at preserving financial stability will in fact avoid or mitigate financial crises.[83] In contrast, the immediate

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[79] "[These systems] typically have "fat tails," in which large or even extreme events appear with a regularity that would be unthinkable from the perspective of normal probability assumptions." Kysar, *supra* Note 14 at 216.

[80] While the consequences of an environmental disaster may seem more irreversible than those of a financial crisis (for example, once a species is extinct, this cannot be reversed), the social consequences of the recessions that follow deep financial crises are lasting, notwithstanding that the broader economy will eventually cycle into a more prosperous time. For example, in the wake of the Financial Crisis, there has been much talk of a "lost generation" of young people who have been unable to find work and may never develop the skills and experience necessary to establish long-term employment. Because of uncertainty about long-term employment, this "lost generation" has put off life decisions such as marriage, home-buying and procreation. *See*, for example, Adam Clark Estes, *More Signs that American Youth Are a Lost Generation*, ATLANTIC WIRE (September 22, 2011) (available at http://www.theatlanticwire.com/national/2011/09/american-youth-lost-generation/42814/); Robert J. Samuelson, *Is the Economy Creating a Lost Generation?*, WASHINGTON POST (December 9, 2012) (available at http://www.washingtonpost.com/opinions/robert-samuelson-is-the-economy-creating-a-lost-generation/2012/12/09/41683956-4093-11e2-bca3-aadc9b7e29c5_story.html). For further discussion of the application of the precautionary principle to theoretically reversible risks, see Dana, *supra* Note 14 at 1316.

[81] With regard to the financial system, see text accompanying Notes 55-57. Examples of catastrophic failures of environmental systems potentially include species extinction and global warming. Cass Sunstein, *Irreversible and Catastrophic*, 91 Cornell L. Rev. 841, 842 (2005-2006).

[82] Rajan, *supra* Note 12 at 350. Many described the Financial Crisis as the proverbial hundred year storm, but the frequency of financial crises in the United States in the last 200 years suggests that they are much more common than that: there were significant bank panics in the United States in 1837, 1857, 1873, 1907, and of course, during the Great Depression (*see* Gorton & Metrick, *supra* Note 15, at 283). After the introduction of Federal deposit insurance in 1934, financial crises migrated outside of traditional banks: the United States saw the Savings and Loan Crisis of the 1980s and 90s, and a crisis was narrowly avoided (by a private-sector bailout) after the failure of hedge fund Long Term Capital Management in 1998 (LTCM's failure was sparked by other, international financial crises). Indeed, JPMorgan CEO Jamie Dimon testified his belief that financial crises will occur every five to seven years. Sewell Chan, *Voices That Dominate Wall Street Take a Meeker Tone on Capitol Hill*, N.Y. Times (January 13, 2010) (available at http://www.nytimes.com/2010/01/14/business/14panel.html)

[83] Rajan has noted that "a risk management approach boils down to judgments about costs and probabilities, and at present, these will be subjective." Rajan, *supra* Note 12 at 350.

costs of taking regulatory action are usually readily apparent.[84] Similarly, the costs of environmental regulation are usually immediately obvious, whereas environmental regulators are often unable to demonstrate the "benefit" side of the regulatory equation – in terms of the catastrophes that may be prevented – to the levels of proof required by cost-benefit analysis.[85] Proponents of the precautionary principle take the view that in the face of such Knightian uncertainty, regulators should be permitted to make value judgments about the propriety of regulatory action.[86] Such a precautionary approach seems apt as a guiding principle for both financial and environmental regulation.

Of course, there is a limit to the parallels that can be drawn between environmental and financial stability regulation.[87] Environmental regulation does lay a stronger claim to a precautionary approach, because it is directly aimed at avoiding threats to health, life and safety. Financial stability regulation instead has the primary goal of avoiding threats to the economy. However, failure of economy has secondary consequences for health, life and safety which can be dire,[88] and the magnitude of these social costs is sufficient to justify employing a precautionary approach to financial stability regulation, notwithstanding that financial crises may be less calamitous than environmental disasters. A precautionary approach is particularly justified if the cost of financial stability regulation (measured in terms of the cost to society as a whole, rather than focusing on the private compliance costs borne by financial institutions) is not overly high.[89]

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[84] See text accompanying Notes 66-67.

[85] Weitzman argues that "[t]he economics of fat-tailed catastrophes raises difficult conceptual issues that cause the analysis to appear less scientifically conclusive and more contentiously subjective than what comes out of an empirical CBA of more thin-tailed situations. But if this is the way things are with fat tails, then this is the way things are. . . . . Perhaps in the end the climate-change economist can help most by *not* presenting a cost-benefit estimate . . . as if it is accurate and objective." Martin L. Weitzman, *On Modeling and Interpreting the Economics of Catastrophic Climate Change*, 91 REV. ECON. & STAT. 1, 18 (2009).

[86] Kysar, *supra* Note 14 at 235.

[87] For example, the concept of "irreversibility" may apply differently in different types of systems. *See* note 80. Also, advances in the natural sciences may provide more certainty as to the operation of environmental systems, and therefore more certainty about how to regulate the system. In contrast, the "science" of financial markets is not replicable or susceptible to precise scientific evaluation. Schwarcz, *Regulating Complexity*, *supra* Note 19 at 237. For this reason, the argument for the use of the precautionary principle with respect to financial regulation may actually be stronger than for environmental risks that have become "known" rather than "uncertain", through scientific research.

[88] Financial collapse can lead to widespread increases in unemployment, poverty and crime, which may indirectly cause death and disease. Schwarcz, Systemic Risk, *supra* Note 19 at 207.

[89] By way of illustration, Section 4.B of this Article will consider what benefits would be foregone if a precautionary approach to regulating financial innovation were adopted.

B. Formulation of a Precautionary Principle for Financial Stability Regulation

In devising a precautionary principle to inform financial stability regulation, it is helpful to look at the formulations of the precautionary principle that have been elucidated from the environmental literature by Sunstein. Sunstein identifies three different "strengths" of the precautionary principle: the weakest version of the precautionary principle can be expressed as the notion that "lack of decisive evidence of harm should not be grounds for refusing to regulate."[90] This weak-form precautionary principle is a prerequisite to *any* financial stability regulation because, given the uncertainty that flows from the complexity of the financial system, it is impossible to show conclusively that certain activities will harm financial stability.[91] A stronger formulation of the precautionary principle is the position that, where activities can pose great harm, precautionary regulation should be employed that effectively shifts the burden of proof that the activity should be permitted to the proponent of that activity, rather than the regulator having to make the case for why regulation is necessary.[92] The strong*est* form of the precautionary principle dictates that the potential for great harm justifies *any* regulatory intervention, and/or that the proponent of an activity must conclusively demonstrate that the activity is safe before it is allowed.[93] This Article advocates the stronger, but not the strongest, form of the precautionary principle: the uncertainties in the financial system are inherent and no financial activity can conclusively be proved safe, so using the strongest form of the precautionary principle would incapacitate regulators, preventing them from allowing any financial activities.[94]

Importantly, use of the stronger-form precautionary principle in financial stability regulation does not mean that regulators should ignore the costs imposed by such regulation.[95] While this Article advocates a move away from cost-benefit analysis *qua* cost-benefit analysis, a flexible analysis of the costs and benefits of regulation should still be performed although "the burden of proof [has been shifted] to proponents of regulatory inaction."[96] Rather than adhering to a strict monetization of costs and

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[90] Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1012.
[91] See text accompanying Notes 60-65.
[92] Cass R. Sunstein, *Irreversible and Catastrophic: Global Warming, Terrorism, and Other Problems*, 23 PACE ENVTL. L. REV. 3, 6 (2005-2006) [hereinafter Sunstein, *Irreversible and Catastrophic*]; Dana, *supra* Note 14 at 1315.
[93] Sunstein, *Irreversible and Catastrophic*, *supra* Note 92 at 6; Kysar, *supra* Note 14 at 243; Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1013.
[94] Regulators would be stymied by the strongest form of the precautionary principle, because by blocking any new activity for failing to satisfy an impossibly high burden of proof, they would necessarily block the benefits of these new activities, and blocking the benefits of activities is an inadvertent harm that the regulators cannot endorse.
[95] Kysar, *supra* Note 14 at 204; Dana, *supra* Note 14 at 1316.
[96] Dana, *supra* Note 14 at 1315.

benefits, a precautionary approach would accept that maintaining a stable financial system is a benefit to society of great magnitude[97] and that the fiscal and monetary remedies available after a crisis are costly,[98] while acknowledging that neither of these can be accurately reflected as a dollar amount. Nonetheless, these benefits must be weighed against the costs of the regulation, both in terms of immediate quantifiable short-term costs, and long-term unquantifiable costs in the sense of foregone benefits (the latter of which should also be considered from a precautionary perspective).[99]

So how would we embed this strong-form precautionary approach into financial stability regulation? Statutes that aim to improve financial stability by restricting financial institution activities should expressly direct regulators to devise implementing regulation in a precautionary way, prioritizing society's interests in avoiding financial crises. In some ways, Dodd-Frank has already taken the first step in this direction, with numerous provisions directing regulatory agencies to be mindful of threats to the financial stability of the United States.[100] However, to ensure that precautionary concerns are not ignored at the regulatory agency level,[101] or by the courts, legislation relating to financial stability should expressly direct regulators to approach rule-making from a precautionary, rather than a cost-benefit, perspective. Regulators should face the prospect of having to provide Congress (or others) with a description of how their rules reflect this standard,[102] and the D.C. Circuit (and other courts) should use this standard in their review of any agency rulemaking that is challenged as arbitrary and capricious.

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[97] Schwarcz comments that the benefits of financial stability regulation can be viewed as the costs saved by avoiding systemic risk. These are high, because they include indirect social costs that can be avoided if systemic collapse is avoided. Schwarcz, Systemic Risk, *supra* Note 19 at 235.

[98] Rajan discusses some of the costs of monetary policy intervention in the form of reduced interest rates: these are effectively a tax on savers, and a boon for those who need liquidity (potentially creating moral hazard for them – they will come to expect liquidity infusions in future crises and act accordingly). Rajan, *supra* Note 12 at 347-348. Finally, a low interest rate increases incentives for products with high yields, setting the scene for another innovation frenzy. With regard to the cost of fiscal policy remedies, see Notes 53 and 54 and accompanying text.

[99] Kysar, *supra* Note 14 at 231. Some of the long-term unquantifiable costs of regulation that inhibits financial sector activity might be "higher credit costs, lower credit availability, and slower economic growth." Mark Van Der Weide, *Implementing Dodd-Frank: Identifying and Mitigating Systemic Risk*, Economic Perspectives, 108, 110 (2012).

[100] See Notes 21-23 and accompanying text.

[101] Referring to Dodd-Frank, Senator Carl Levin stated "We hope that our regulators have learned with Congress that tearing down regulatory walls without erecting new ones undermines our financial stability and threatens our economic growth. We have legislated to the best of our ability. It is now up to our regulators to fully and faithfully implement these strong provisions." Senator Carl Levin, cited in Simon Johnson, W*here is the Volcker Rule?,* N.Y. TIMES (December 15, 2011) (available at http://economix.blogs.nytimes.com/2011/12/15/where-is-the-volcker-rule/)

[102] Dana, *supra* Note 14 at 1329.

To that end, a provision to the following effect could be inserted into the relevant legislation:

> In adopting rules to carry out [*legislative provision*], [*relevant agency*] shall seek to maximize financial stability, and minimize impediments to the capital intermediation, risk management, and other socially-useful functions performed by financial institutions. [*Relevant agency*] shall consider whether the benefits to financial stability and other benefits of such rules justify the costs of such rules; *provided that*: (i) there is a rebuttable presumption that the benefits of any rules proposed or adopted pursuant to this [*legislative provision*] justify their costs; and (ii) lack of empirical evidence of such benefits shall not be grounds for refusal to propose or adopt such rules.

To put this standard in a more concrete context, had it been included in the Volcker Rule, it would have created a rebuttable presumption that the benefits to financial stability that derive from a ban on proprietary trading outweigh the social costs of limiting market-making and risk-mitigating hedging activities. Any financial institution that wanted rules that broadly construe the Volcker Rule's exceptions for market-making and hedging activities would bear the burden of demonstrating to the Federal Reserve, the SEC, the CFTC, the OCC and the FDIC that the benefits of such exceptions outweigh the costs to financial stability (i.e. that regulation of the proposed activities is unnecessary).

This type of shifting of the regulatory burden would help address the informational, resource and expertise constraints faced by financial regulators: the resources of the regulators are dwarfed by those of the financial industry they regulate, and Dodd-Frank's new focus on systemic risk will only exacerbate the situation (regulators will now need to collect and process more, and more complicated, information that relates to systemic interactions and trends, as well as individual institutions and products).[103] However, regulatory resource constraints would be eased by a precautionary approach that requires financial institutions to take the initiative and approach the regulator if they want activities to be permitted, rather than the regulator having to scramble to keep up with financial institutions. Financial institutions could also be directed to conduct, at their

[103] Eric Pan notes that limitations on regulatory funding and expertise currently impact the ability of financial regulators to supervise financial institutions in two key ways: first, resources are needed to marshal the voluminous information available regarding regulated transactions and firms. Second, resources are needed to help regulators process complicated information. With regard to a financial institution that is so large or interconnected that a problem there will imperil the broader financial system, constant supervision of that institution's solvency or liquidity will be required, which further taxes regulatory resources. *See* Pan, *supra* Note 33 at 16.

expense, stress tests and other simulations to test the potential systemic effects of their activities.

Of course, when regulators are being provided with information by their regulated industry, there is always potential for regulatory capture issues to arise. Since the Financial Crisis, much has been written about the cognitive capture of financial regulators, being the situation where the regulator has "effectively internalized the objectives, concerns, worldview and fears of the financial community,"[104] rather than looking at the objectives, etc. of society as a whole. Because this cognitive type of regulatory capture arises not from corrupt requests for favors, but rather from a type of soft, cultural power,[105] it is particularly difficult to avoid. The phenomenon of cognitive capture is exacerbated by the complexity of the financial system: complexity creates a type of opacity that incentivizes regulators to take shortcuts in their understanding of the many actors and products that comprise the system.[106] In many circumstances, the most obvious shortcut is to rely on the expertise (and thus the world view) of the financial institutions that form the financial regulator's constituency.[107]

As a potential solution to capture, McDonnell and Schwarcz have noted the benefits of implanting "regulatory contrarians" within financial regulatory agencies, who are independent monitors that will force the

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[104] Buiter, *supra* Note 17 at 601. *See* generally, James Kwak, *Cultural Capital and the Financial Crisis*, draft chapter dated October 24, 2011 to be included in Daniel Carpenter and David Moss (eds), PREVENTING CAPTURE: SPECIAL INTEREST INFLUENCE IN REGULATION, AND HOW TO LIMIT IT (forthcoming; available at http://www.tobinproject.org/books-papers/preventing-capture). In a similar vein, former Federal Reserve economist Arnold Kling notes that "[r]egulators, sharing the same cognitive environment as financial industry executives, are unlikely to be able to distinguish evolutionary changes that are dangerous from those that are benign." Kling, *supra* Note 16, at 509.

[105] "It can be called cognitive regulatory capture (or cognitive state capture), because it is not achieved by special interests buying, black- mailing or bribing their way towards control of the legislature, the executive, the legislature or some important regulator or agency, like the Fed, but instead through those in charge of the relevant state entity internalising, as if by osmosis, the objectives, interests and perception of reality of the vested interest they are meant to regulate and supervise in the public interest. . . although the Bernanke Fed has but a short track record, its too often rather panicky and exaggerated reactions and actions since August 2007 suggest that it also may have a distorted and exaggerated view of the importance of financial sector comfort for macro-economic stability." Buiter, *supra* Note 17 at 601-602.

[106] If regulators are unable to understand an activity, they will be more likely to defer to what they are told about that activity by financial institutions. Kwak discusses this in the context of regulators considering the value of VaR models: it was difficult for them not to defer to "a new theory that, while not practically tested, was supported by famous economists." Kwak, *supra* Note 104 at 24.

[107] "Forced to evaluate opposing arguments that are difficult to compare and often based on incommensurate policy objectives . . . regulators are more likely to resort to proxies such as their degree of trust in the people making those arguments or their academic pedigree." *Id.* at 31.

agencies to "(1) take an outsider perspective on their work, (2) consider the opposite outcome to which they are inclined to take, (3) interact during the decision-making process with persons with differing backgrounds and biases, and (4) publicly defend their positions."[108] In a similar vein, Kwak has identified a potential solution to the cognitive capture problem in the form of "institutionalizing independent "devil's advocates" within agencies to represent contrarian viewpoints; by forcing regulators to justify their positions using evidence and reason, they could reduce the influence of unconscious biases and reliance on illegitimate proxies."[109] A precautionary approach takes these proposals one step further: it essentially directs all agency members to be "contrarians" or "devil's advocates", coming to the table with the perception that financial institution activities (such as market-making and hedging activities, in the context of the Volcker Rule's prohibition on proprietary trading) are presumptively problematic for financial stability, and therefore in need of regulation unless the financial institution can demonstrate otherwise. By creating a form of adversarial process between the regulators and the regulated, groupthink is roiled: the regulator no longer self-identifies as being on the same team as the regulated.[110] Separating the identity of the regulators from the regulated can make regulators less trusting of the industry they regulate, and thus more skeptical of industry claims that their activities are socially useful and pose no harm.[111] Of course, given the "revolving door" between financial regulatory agencies and the institutions they regulate,[112] and the necessity of ongoing contact between them, it is unlikely that the use of the precautionary principle will completely prevail over cognitive regulatory

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[108] McDonnell & Schwarcz, *supra* Note 17 at 1647.

[109] Kwak, *supra* Note 104 at 36.

[110] Kwak notes that "[i]f a regulator sees her job as protecting ordinary people and believes that financial institutions harm consumers, siding with industry will create psychological tension." Kwak, *supra* Note 104 at 31. The EPA is one of the most oft-cited examples of a regulator that has *not* been captured by its regulated constituency, largely because its identity is linked to the environment it aims to protect, rather than the industry it regulates. *Id*. at 18. In contrast, banking supervisory agencies such as the OCC and the OTS have been identified as captured agencies – see, for example, Arthur E. Wilmarth, Jr., *The Dodd-Frank Act's Expansion of State Authority to Protect Consumers of Financial Service*, 36 J. CORP. L. 893, 909; 951 (2010-2001).

[111] Kwak, *supra* Note 104 at 14-15. The problems posed by regulatory capture are particularly acute when a country has reached the peak (or perhaps the nadir) of what Coffee has termed "the regulatory sine curve": when the economy is doing well, regulators tend to relax regulatory strictures in response to industry demand because the public has less interest in financial regulatory matters. A precautionary approach is likely to be particularly valuable at this point in the "sine curve". *See* John C. Coffee, Jr., *Systemic Risk After Dodd-Frank: Contingent Capital and the Need For Regulatory Strategies Beyond Oversight*, 111 COL. L. REV. 795, 821 (2011); McDonnell & Schwarcz, *supra* Note 17 at 1644.

[112] It is almost expected that regulators will work within the financial industry after they complete their public service. Kwak, *supra* Note 104 at 17.

capture in the financial sphere.[113] However, a precautionary-inspired disruption of the shared cognitive identity of financial regulators and financial institutions is likely to improve the situation.

Regulatory capture also creates collective action problems, in that it causes regulators to give more weight to the concerns of their regulated industry than to the more diffuse concerns of other members of society.[114] While almost all members of society have a vested interest in regulation that improves financial stability,[115] it is difficult to marshal public support for complex financial stability regulation that cannot be reduced to sound bytes. Even to the extent that members of the public do wish to support financial stability regulation, it can be difficult for such a broad and dispersed group to compete with the influence of the financial industry,[116] which is highly organized and focused on avoiding the short-term costs that it will bear as a result of financial regulation.[117] The complexity of the financial system exacerbates these collective action problems: it allows the financial industry to dismiss the views of outsiders on the grounds that they "couldn't possibly understand" the complexities of the financial system.[118]

The precautionary principle can have salutary effects in these circumstances. People (regulators included) have a natural bias towards the

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[113] And indeed, close interactions between the financial industry and its regulators have some benefits, in the form of information sharing and cooperation. *Id*. at 33.

[114] This access issue is not just a concern at the professional level – "financial regulator are likely to share more social networks with financial institutions and their lawyers and lobbyists that with competing interest groups such as consumers." *Id.* at 27.

[115] See text accompany Notes 55-57.

[116] "There are vast numbers who have a common interest in preventing inflation or depression, but they have no lobbying group to express their interest." MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION 166 (1971). Gary Gensler, Chairman of the CFTC, had the following to say regarding the CFTC's interactions with lobbyists during the Dodd-Frank rulemaking process: "We've had about 475 meetings in five months. And since the lobbyists haven't found us on the weekends (usually), you can do the arithmetic. It's quite a bit. I will say this: In America, large institutions have a great deal more resources than the investor advocates. If you looked at those 475 meetings — and we're posting every one of them on our Web site — 90-plus percent are probably larger institutions or corporations." Gensler quoted in Ben Protess and Mac William Bishop, *At Center of Derivatives Debate, A Gung-Ho Regulator*, N.Y. TIMES (February 10, 2011) (available at http://dealbook.nytimes.com/2011/02/10/at-center-of-debate-over-derivatives-a-gung-ho-regulator/). These collective action issues are similar to those faced in the environmental sphere: "the bearers of many environmental and health risk are the general public, and the transaction costs of organizing a large, diffuse population are much higher than the costs of organizing, say, a handful of auto manufacturers." Dana, *supra* Note 14 at 1332.

[117] "From 1999 to 2008, the financial sector expended $2.7 billion in reported federal lobbying expenses; individuals and political action committees in the sector made more than $1 billion in campaign contributions." *See* FCIC Report, *supra* Note 2 at xviii.

[118] This notwithstanding that "it has been widely acknowledged that even the most (ostensibly) sophisticated counterparties failed to grasp the technical nuances of many of the new instruments and markets made possible by the confluence of advances in financial theory and information technology." Awrey, *supra* Note 51 at 18.

primacy of immediate, high-probability events.[119] In the context of financial regulation, the immediate high-probability event is an increase in compliance costs for the financial industry.[120] This is the same event that financial industry special interest groups are most concerned about, and absent a precautionary approach to assessing the benefits of financial stability regulation, it can be difficult for regulators not to prioritize such concerns.[121] In this sense, the high level of organization and singularity of purpose of financial industry lobbyists intensifies the hardwired cognitive bias that is likely to lead a regulator to give primacy to the impact of compliance costs, and thus ignore the interests of a wider, dispersed society in financial stability.[122] By requiring regulators to think more globally about the possible downsides of a particular financial activity (and, potentially, to explain such thinking before Congress), a precautionary approach encourages regulators to consider a broader, more disparate range of perspectives about what constitutes social welfare.[123] This in turn could lead to more access to regulators for other sectors of society: "the inclusion of the [precautionary principle] in policy and political discourse provides advocates of regulations with a means to remind both decision makers and the general public who influence decision makers of the importance of protecting against unsure, future risks and the tendency to give such risks too little weight."[124]

C. Critiques of the Precautionary Principle

This Article thus recommends that the precautionary principle be incorporated into legislation that relates to financial activities and stability. However, a variety of criticisms have been leveled at the precautionary principle in the environmental literature, and it is worth considering if these have any validity in the financial regulation context. One such prevalent criticism is that the precautionary principle is too incoherent and indeterminate to inform any regulatory exercise, whereas cost-benefit

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[119] See text accompanying Notes 129-131.

[120] Dana, *supra* Note 14 at 1322. Cost-benefit analysis is inappropriate "where wealth differences between those who gain from the project and those who lose are substantial enough." Matthew D. Adler & Eric A. Posner, *Rethinking Cost-Benefit Analysis*, 109 YALE L.J. 165, 238 (1999).

[121] "Sometimes people do seem to seek certainty before showing a willingness to expend costs, and well-organized private groups like to exploit this fact. Insofar as the precautionary principle counteracts the tendency to demand certainty, it should be approved." Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1017.

[122] Dana, *supra* Note 14 at 1332.

[123] "The [precautionary principle]'s understanding of costs is much broader than the notion presupposed by [cost-benefit analysis]." Kysar, *supra* Note 14 at 235. Sunstein notes that, in some circumstances, the precautionary principle works well to protect the most disadvantaged sectors of society, with the pragmatic benefit of "emphasizing the importance of attending to issues. . .that might otherwise be neglected." Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1030; 1055.

[124] Dana, *supra* Note 14 at 1329-1330.

analysis provides clarity.[125] While it is true that the precautionary principle is not a formula for precise answers, the complexity of the financial system (and environmental systems) is such that precise answers *cannot* be achieved. Indeed, it is the great uncertainty as to both the costs and benefits of regulation and regulated activity that makes the use of the precautionary principle so appropriate and necessary in these contexts:[126] there are many situations where "we understand a problem well enough to identify a solution or a limited set of reasonable solutions, but for which [cost-benefit analysis] would provide limited aid in grappling with a serious problem."[127]

A more nuanced criticism of the precautionary principle is referred to as the "paralysis" or "risk-risk" conundrum: essentially, the argument is that the precautionary principle is self-defeating, because regulation that seeks to avoid a risk will necessarily create other substitute risks, and the precautionary principle is prevented from endorsing these substitute risks by its own internal logic.[128] However, this criticism has no real relevance except when considering the very strongest forms of the precautionary principle (i.e. where the proponent of an activity must show that their proposed activity has *no* potential for harm before being able to proceed). The formulation of the precautionary principle advocated in this Article would not cause any such paralysis: although it operates to shift the burden of showing that an activity should not be regulated to the proponent of that activity, the burden of proof that that proponent must meet is not insurmountable (i.e. there is no need for them to show that there are *no* adverse consequences of the activity). By the same token, regulators can block activities that are, on balance, likely to be dangerous, notwithstanding that doing so will create some inadvertent harm by preventing the beneficial aspects of the activity.

Some of the most interesting debates regarding the application of the precautionary principle are concerned with cognitive biases known as "heuristics",[129] which are default behaviors or "rules of thumb" that humans tend to employ in the face of complexity.[130] One such cognitive bias is the "availability heuristic", meaning the tendency for people to accord more importance to outcomes that are easily called to mind. In the risk

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[125] *See*, for example, Stone, *supra* Note 71 at 10799; Todd J. Zywicki, *Baptists? The Political Economy of Environmental Interest Groups*, 53 CASE W. RES. L. REV. 315, 333 (2002).

[126] Kysar has commented that "by providing a semblance of order and exactitude where none exists, the results of CBA threaten to obscure the actual severity of uncertainties regarding many environmental, health and safety risks." Kysar, *supra* Note 14 at 231.

[127] Driesen, *supra* Note 4 at 8.

[128] Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1004; 1008.

[129] "[B]iases appear, at least in part, to be rooted in the "hard wiring" of the human brain, and if that is true, experts are unlikely to ever be wholly free of biases." Dana, *supra* Note 14 at 1332.

[130] Haldane & Madouros, *supra* Note 147 at 3.

management context, this essentially means that "[p]eople tend to think that risks are most serious when an incident is readily called to mind or "available.""[131] Some take the view that a precautionary approach entrenches the availability heuristic, *narrowing* the issues considered by regulators by causing them to focus on a particular type of risk that has primacy in the collective mind, either because it is more vivid or more recent, to the neglect of other (perhaps equally grave but not as salient) harms.[132] The concern is that the precautionary principle thus acts as a vehicle for entrenching society's irrational fears,[133] and diverts regulators' attention from the systemic effects of their intervention.[134] However, this criticism fails to recognize that the most salient harms associated with regulation are often compliance costs, because of their immediacy.[135] The starting point for many regulatory exercises is not neutral, then, but a bias towards avoiding compliance costs. Reliance on the precautionary principle in such contexts acts as a correction to the availability heuristic, *broadening* regulatory attention to include less salient, but more grave, long-term systemic risks.

Another heuristic that interacts with the precautionary principle is the concept of "loss aversion" – essentially, because "people dislike losses far more than they like corresponding gains . . . people tend to focus on the losses that are associated with some activity or hazard and to disregard the gains that might be associated with that activity or hazard."[136] Some have argued that because of loss aversion, a precautionary approach tends to neglect the benefits of a regulated activity.[137] However, the applicability of such a critique depends on whether the regulatory exercise is framed as a contest between the losses and gains associated with a particular activity, or as a contest between two different sets of losses. The latter frame is probably more appropriate here,[138] such that the more immediate losses

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[131] Cass R. Sunstein, *Behavioral Analysis of Law*, 64. U. CHI. L. REV. 1175, 1188 (1997).
[132] Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1041.
[133] Frank Furedi, *Precautionary Culture and the Risk of Possibilistic Risk Assessment*, 2 ERASMUS L. REV. 197, 210 (2009)
[134] Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1049.
[135] Dana, *supra* Note 14 at 1322.
[136] Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1008.
[137] *Id*. at 1009.
[138] Dana argues that framing such decisions as a contest between two set of losses is more appropriate in the environmental context, because "most environmental policy debates entail the question whether some *established* economic production, resource extraction, or consumption process should be prohibited, restricted or made more expensive in order to mitigate or eliminate an environmental and health risk." Dana, *supra* Note 14 at 1342 (emphasis added). In the financial context, similar logic would justify viewing restrictions on *existing* financial activities as contests between two sets of losses, but it may be appropriate to view ex ante restrictions on financial innovations as a conceptual battle between losses and foregone benefits. In such a contest, it is theoretically possible that the avoidance of systemic risk could be given too much primacy, but it is likely that loss aversion would be trumped by the availability heuristic, which trains regulatory focus on the more immediate and tangible compliance costs for the financial industry.

(being the quantifiable costs of complying with a regulation) are pitted against the more indeterminate future losses (being the losses that may occur if the precautionary regulation is not put in place). In such a "contest", the loss aversion heuristic favors both sides roughly equally, and the deciding factor is likely to be the availability heuristic: as such, the immediate losses will likely have more primacy than the potential future losses,[139] but the precautionary principle works to refocus regulatory attention on the potential future losses.

Finally, the heuristic known as "probability neglect" has been cited as tending to concentrate regulator focus on certain bad outcomes, notwithstanding that those outcomes are low probability.[140] It is possible that the use of the precautionary principle could cause regulators to give too much weight to low-probability tail events, but the precautionary principle is working against a natural tendency to underestimate tail events.[141] In the context of complex systems at least, low-probability high-impact tail events are the very events regulators are concerned about, so a directed bias against neglect of tail events is likely to be a useful tool in the regulation of such complex systems: here, "it seems more likely that the principle undercorrects, rather than overcorrects."[142]

The precautionary principle, rather than cost-benefit analysis, is therefore more likely to overcome the cognitive biases that unduly focus regulator attention on the short-term, and thus cause financial regulators to adopt the long-term and wide-view approach so necessary to the regulation of an ever-evolving financial system.[143] Of course, the adoption of this precautionary approach will not stop regulators from making mistakes. Indeed, given the complexity of the financial system, errors are inevitable[144] – the only way to entirely avoid regulatory errors is to abandon financial stability regulation altogether. But complete deregulation is not a valid option, given the social costs of financial crises, and given that absent

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[139] Dana, *supra* Note 14 at 1324-1326.
[140] Sunstein, *Beyond Precautionary*, *supra* Note 72 at 1010.
[141] "Individuals tend to ignore low probability catastrophic events." Hu, *supra* Note 15, at 1488. Some attribute the lower weighting of tail events on the availability heuristic – "more likely events are ceteris paribus easier to retrieve from memory than less likely ones." Gennaioli et al., *supra* Note 15 at 14.
[142] Dana, *supra* Note 14 at 1330.
[143] "[T]he concerns expressed with the aid of the precautionary principle may prompt a debate and research that otherwise would never occur and that may produce reasonable safeguards." Dana, *supra* Note 14 at 1319.
[144] McDonnell and Schwarcz cite the capital adequacy standards set forth in Basel II as an example of "deeply considered and deliberate decisions guided by the most sophisticated understandings of the economy" that still went wrong. McDonnell & Schwarcz, *supra* Note 17 at 1641. Regulations can also be destabilizing to the extent that they encourage uniformity and thus heighten procyclicality and correlation of risks. For a detailed discussion of this issue, *see* Charles K. Whitehead, *Destructive Coordination*, 96 Cornell L. Rev. 323 (2011).

regulation, financial institutions have little incentive to structure their risk profiles so as to maintain stability.[145] Recognizing that stability regulation is a necessity, a precautionary approach to devising rules will generate better (if not perfect) outcomes, because it directs regulators to think very broadly about the positive and negative consequences of behavior of both financial institutions *and* regulators,[146] rather than narrowly focusing on the short-term costs of their regulation. Furthermore, because this precautionary standard does not require regulators to defend their rules by way of empirical models of costs and benefits, it allows regulators to make informed value judgments in the face of uncertainty about what regulation will best serve financial stability. Such an approach allows simpler and better regulatory solutions than those developed specifically to withstand cost-benefit analysis.[147]

In sum, the advantages of a precautionary approach to financial stability regulation are manifold. Notwithstanding these advantages, however, there needs to be sufficient political will to implement such a precautionary approach. The precautionary principle may find broad *popular* support if the true gravity of financial crises is appreciated,[148] but the principle is likely to be very unpopular with the financial industry, to put it mildly. Because of collective action problems, the financial industry (rather than society at large) is likely to have more input in the development of financial legislation,[149] and the industry is more likely to support (effectively deregulatory) attempts to entrench cost-benefit analysis. However, it is by no means certain that the financial industry will benefit in the long-term from such an approach. While such legislation will help the financial industry avoid compliance costs in the short-term (and also retain fee-based income from activities which might otherwise have been limited or banned by regulation), it is highly likely that these savings will be wiped-out (and then some) in a future financial crisis.[150] If financial institutions

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[145] See Notes 31-33 and accompanying text. *See* also Whitehead, *supra* Note 144 at 358.

[146] Regulators can look skeptically at the existing regulatory structure: Chuck Whitehead has argued that the FSOC, as it oversees the work of other financial regulatory agencies, is well situated to look out for regulatory policies that are, on balance, creating more systemic risks than they are preventing. Whitehead, *supra* Note 144 at 329-330.

[147] With regard to simple rules being more effective in achieving financial stability than solutions based on complex mathematical and economic modeling, *see* Haldane & Madouros, *supra* Note 47 at 5.

[148] There is certainly precedent for the United States populace to embrace the precautionary principle in exigent circumstances – they did so quite strongly in the context of law and policy regarding anti-terrorism measures and national security in the wake of September 11. *See* Furedi, *supra* Note 133 at 209-210.

[149] As Senator Dick Durbin put it, "the banks . . . are still the most powerful lobby on Capitol Hill. And they frankly own the place." Ryan Grimm, *Dick Durbin: Banks "Frankly Own the Place"*, HUFFINGTON POST (May 30, 2009), available at http://www.huffingtonpost.com/2009/04/29/dick-durbin-banks-frankly_n_193010.html.

[150] Turner notes that "the impact of increased credit intermediation costs in good years can be offset by a decreased risk of financial crises." Turner, *supra* Note 28 at 15. For example,

buy into the notion that precautionary regulation is about improving long-term stability and sustainable growth, rather than about foregoing short-term profits, then perhaps industry opposition could be muted.[151]

4. FINANCIAL INNOVATION: A TEST CASE FOR A PRECAUTIONARY APPROACH TO FINANCIAL STABILITY REGULATION

This Article does not propose a detailed practical model for precautionary review of all activities that can affect financial stability – it is intended more to inspire a general debate about the approach that financial regulators and courts should take to financial stability regulation. However, the practicalities of implementing a precautionary approach will necessarily inform such a debate. Accordingly, this Section does offer, by way of example, some preliminary insights on how a model for precautionary review of newly introduced financial innovations might be structured.[152] While Dodd-Frank makes little attempt to regulate financial innovation, this Section will demonstrate that such innovation has the potential to seriously impact financial stability. Restrictions on financial institutions' ability to engage in innovation therefore serve as a useful test case for a precautionary approach to financial stability regulation. The new frameworks for *ex ante* regulatory evaluation of financial innovations that have been proposed by Posner & Weyl and Omarova are a useful starting point in this endeavor.[153]

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financial stability allows financial institutions to avoid the interest rate squeezes in the low-interest rate environments that generally follow crises. "In fact, the pressure on spreads poses an even greater threat to the banks' earnings than the new financial regulations. Oliver Wyman, a financial services consulting firm, estimates that the industry's deposit revenue will shrink by more than $55 billion from its precrisis levels, dwarfing the roughly $15 billion in lost fee income from debit card and overdraft restrictions." Eric Dash and Nelson D. Schwartz, *In Cautious Times, Banks Flooded with Cash*, N.Y. TIMES (October 24, 2011) (available at http://www.nytimes.com/2011/10/25/business/banks-flooded-with-cash-they-cant-profitably-use.html?pagewanted=1&_r=2&ref=business).

[151] For further discussion of reframing policy decisions as choices between gains, *see* Dana, *supra* Note 14 at 1340-1341.

[152] To be most effective, precautionary regulation of financial innovation should cover all new financial products, irrespective of who provides them. This means that regulation should be targeted not only at traditional regulated financial institutions, but also at the shadow banking industry (otherwise, innovative products may migrate into the unregulated sector). Similarly, regulation would ideally be international in scope, to prevent regulatory arbitrage between different jurisdictions. However, the development of international financial regulation, and regulation of the shadow banking industry, are extremely complex tasks that go beyond the scope of this Article. For further discussion of shadow banking, *see* Gorton & Metrick, *supra* Note 15. With regard to international coordination of financial regulation, *see* Christopher J. Brummer, *How International Financial Law Works (And How It Doesn't)*, 99 GEO. L. J. 257 (2011).

[153] Eric A. Posner & E. Glen Weyl, *An FDA for Financial Innovation: Applying the Insurable Interest Doctrine to Twenty-First-Century Markets*, CHICAGO JOHN M. OLIN LAW & ECONOMICS WORKING PAPER No. 589 (February 2012); Omarova, *supra* Note 73, at 21.

A. Proposals for Regulation of Financial Innovation

Given the number and complexity of moving parts in the financial system, it is already very difficult for regulators to figure out how to preserve financial stability.[154] Innovation introduces new and complex products into the financial system, which "stresses the capacity of regulators to keep up and understand how to regulate these instruments."[155] Regulators not only need to know about the new products themselves, but also about which institutions are dealing in the new products and in what volumes:[156] even assuming that regulators had perfect information, this would be a daunting task, but new financial products are usually thinly traded which means that less information is available to regulators through the markets.[157] Furthermore, much of the theory and many of the models relevant to evaluating financial innovations are proprietary,[158] and often remain unavailable to regulators until they are outdated.[159] As a result, regulators often do not have all of the information about these new products available to them, which impedes their ability to regulate them.

To address these types of issues, in a recent paper, Posner & Weyl propose that financial institutions be forbidden to market new financial products unless such products are approved by a regulatory agency equivalent to a financial "FDA".[160] The agency proposed by Posner & Weyl would not approve a product unless it is deemed socially utile, which determination would be based primarily on the criterion of whether the innovation is intended for hedging purposes (i.e. risk-management purposes, which in Posner's & Weyl's view makes the innovation socially utile) or speculative purposes (which in their view renders the innovation inutile).[161] In the absence of demonstrable social utility, Posner & Weyl argue that regulators should ban a new product.[162] Posner's & Weyl's proposal is useful in that it considers metrics (many of which are based on the number-crunching of publicly available data)[163] which assist determinations of whether a product genuinely facilitates risk management and/or capital

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[154] Pan, *supra* Note 33 at 42.
[155] *Id*. at 35-36.
[156] Hu, *supra* Note 15, at 1507.
[157] *Id.* at 1501.
[158] *Id*. at 1498-1499. Hu notes that "[m]uch of the technical information may be in the hands of industry. The industry can try to use the information to influence the agency as a bargaining chip." *Id*. at 1498 note 241.
[159] For a discussion of the delay between developments in derivatives theory, and when the details of those developments are published in academic journals, see *Id.* at 1499.
[160] Posner & Weyl, *supra* Note 153, at 1.
[161] *Id*. at 2. This Article will not enter into the ongoing debate regarding the social utility of speculation.
[162] In some instances, rather than banning a new product, they propose restricting the use of the product to those who have some form of "insurable interest" to be protected by the use of the new product. Posner & Weyl, *supra* Note 153, at 18-31.
[163] *Id*. at 36.

formation, or is lacking in social utility. However, Posner & Weyl note that their model largely ignores the issues of systemic risk and financial stability,[164] which are the primary focus of this Article. It is quite possible that a financial product, even if it is used for socially utile risk-management purposes, could create systemic risk. For example, a risk-management innovation could increase opacity by obscuring the real location of risk, or could create interconnections in the financial system that speed up the transmission of risk.

In contrast to the Posner & Weyl proposal, Omarova's proposal does consider issues of systemic risk. She suggests that there be created a Financial Product Approval Commission ("FPAC")[165] with the discretion to ban or to conditionally approve new financial products.[166] Under Omarova's proposal, any transactions involving a financial product that has not been approved by the FPAC would be deemed void and unenforceable, and any third parties who unknowingly entered into such transactions would be entitled to damages and rescission rights.[167] Omarova sets out a framework for the evaluation of financial innovations by the FPAC which seems to rely on a precautionary conceptual framework that is very similar to that advocated in this Article: importantly, "[t]he applicant entity would bear the burden of showing that the proposed product meets all of the statutory and regulatory criteria for approval."[168]

Omarova suggests a tripartite test that the FPAC should use for evaluating financial innovation: the first part of this test is an "economic purpose" test:[169] essentially, does the innovation satisfy a socially useful purpose? To enable regulators to make such a determination, Omarova suggests that, with a high degree of specificity:

> *an applicant firm will have to (1) identify the intended market for the proposed financial product and describe potential users of the product; (2) show that the product will fulfill a specific business need of potential "product users," which the existing financial products fail to fulfill; and (3) demonstrate that this legitimate business need significantly outweighs any potential uses of the product for speculative investment or regulatory arbitrage as the*

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[164] *Id*. at 6.
[165] This Article does not consider in any detail the political, jurisdictional and administrative law issues related to granting product review authority to any financial regulatory agency. Omarova, however, considers these issues in the context of establishing the FPAC. Omarova, *supra* Note 73, at 65-70.
[166] *Id*. at 68.
[167] *Id*. at 70-71. Omarova suggests that civil and criminal penalties, as well as disqualification from certain lines of business, might also be appropriate.
[168] *Id*. at 68.
[169] *Id*. at 52.

> *core motivation for the product user (or the applicant firm) to enter into the proposed transaction.*[170]

The second part of Omarova's test is an institutional capacity test, which boils down to the question: "Do we want this particular institution to trade and deal in this particular product?"[171] Regulatory determinations of institutional capacity would depend on, amongst other things, an institution's ability to incur leverage, its business and risk profile, its internal compliance and management structures, and any history of enforcement actions.[172]

The third part of Omarova's test is a broad "systemic effects" test, which provides that an innovation will not be permitted if it poses "potentially unacceptable systemic risk or is otherwise likely to increase the vulnerability of the financial system."[173] This is probably the hardest part of the determination to put guidelines around: by necessity, regulators would need to retain a large amount of discretion in implementing such a test. As part B of this Section will explore, the key is for regulators to exercise this discretion in a precautionary manner. Omarova proposes that regulators be expressly directed to consider broad public policy considerations, and that the "applicant firm bears the burden of proving that the financial instrument it seeks to market is not likely to have a negative impact on broader socio-economic policies and political goals."[174] Because this shifts the regulatory burden to the financial industry and directs regulators to prioritize (and think creatively about) society's interest in a stable financial system, Omarova's proposal serves as a very good example of how a precautionary approach might be operationalized.

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[170] *Id*. at 53. Omarova suggests that it might be appropriate to "create a rebuttable presumption against approving financial products whose identified prospective users include only financial institutions that ordinarily engage in financial risk management and transfer as part of their core business." *Id*. This is an interesting thought that might help address the growth of "too big to fail" institutions discussed in the text accompanying Notes 254-255.

[171] *Id*. at 58.

[172] *Id*. at 57. Alternatively, the regulatory approval mechanism could be structured such that once a product has been approved (conditionally or otherwise), *all* financial institutions are then free to issue or underwrite the product (subject of course to any conditions on the approval). That is not to say that the question of who is using the product is irrelevant – the nature of the users of financial innovations should be considered as part of the systemic risk inquiry. To address these systemic risk concerns, financial regulators could potentially create tiered conditions for approval of new products that would apply more stringently when approved innovations are used by large and interconnected financial institutions (much in the same way as Dodd-Frank imposes more stringent requirements on large banks and non-bank financial institutions than it does on other institutions).

[173] *Id*. at 57.

[174] *Id.* at 59.

B. A Precautionary Review of the Costs and Benefits of Financial Innovation

While their proposals are clearly of a precautionary bent, Posner & Weyl and Omarova all expressly disclaim any consideration of whether the precautionary principle should inform the regulation of financial innovation.[175] In contrast, in an article on financial innovation written shortly after the Financial Crisis, Robert Litan does consider whether a precautionary approach to clearing financial innovations should be taken. Litan ultimately rejects such a precautionary approach, on the grounds that the costs of "chilling" the financial innovation process are sufficiently great, and the effects of financial collapse are not sufficiently catastrophic.[176] This Article has already reached the contrary conclusion that the potential consequences of a financial crisis can indeed be catastrophic;[177] the remainder of this Section will consider in detail the concerns Litan raises about a precautionary approach chilling innovation by considering, from a precautionary perspective, the benefits and costs of financial innovation.

As discussed earlier in this Article, the primary functions of the financial system are to provide ways of managing risk, and to intermediate capital – that is, to connect those who want to earn a return with those that need (and are willing to pay) to offload risk or get money.[178] There is a concern that regulation that chills future financial innovation has the potential to limit improvements in the ways risk management and capital intermediation are carried out.[179] It is important to realize, though, that capital intermediation and risk management are not beneficial ends in themselves, and therefore that limitations on the development of these functions are not necessarily costly to society. Instead, risk management and capital formation need to be considered in their broader, systemic context: they are useful only to the extent that they support broad-based

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[175] Omarova, *supra* Note 73, at 21; Posner & Weyl, *supra* Note 153, at 4.

[176] "[I]f a skeptical view of financial innovation takes hold – either because the benefits of innovation are perceived to be presumptively small and/or the risks of catastrophic damage are feared to be non-trivial – then policymakers (and even voters) are likely to demand some sort of pre-emptive screening and possibly design mandates before financial innovations are permitted to be sold in the marketplace. This attitude very like would chill the development of financial innovations that would benefit consumers, homeowners and investors." *See* Litan, *supra* Note 15 at 45.

[177] See the text accompanying Notes 55-57.

[178] See the text accompanying Notes 24-28.

[179] For example, Schwarcz is concerned that an attempt to proscribe certain types of complex transactions could limit the ability of parties to transfer risk to other parties more willing to bear it, and thus increase their funding costs. Schwarcz, *Regulating Complexity*, *supra* Note 19 at 239. Rajan has argued that "The expansion in the variety of intermediaries and financial transactions has major benefits, including reducing the transaction costs of investing, expanding access to capital, allowing more diverse opinions to be expressed in the marketplace, and allowing better risk sharing." Rajan, *supra* Note 12 at 314-315. Limitations on innovation could potentially reduce these benefits.

sustainable economic growth. Many of the financial instruments that have been vilified as causing or exacerbating the Financial Crisis were in fact created to improve risk management or capital formation, but ended up damaging financial stability and thus impairing economic growth. For example, a CDS can be conceived of as a risk management tool, because it enables the holder of a debt instrument to pay a CDS issuer to take on the risk that some type of "credit event" (such as a bankruptcy or a credit rating downgrade) might befall the issuer of the debt instrument.[180] MBSs are a way of facilitating capital intermediation, because they provide a way for investors to invest in a pool of mortgages, when those same investors might be loath to invest directly in the individual mortgages (a security backed by a pool of mortgages is a much more attractive investment proposition than a single mortgage because the former allows for greater diversification and liquidity).[181] However, notwithstanding their seeming utility, the Financial Crisis demonstrated that rampant use of CDSs and MBSs posed grave threats to systemic stability: CDSs because they increased the amount of leverage and interconnectedness in the financial system,[182] and MBSs because they fuelled an unsustainable housing bubble by generating an uncontrolled appetite for residential mortgages.[183]

If legislation were enacted that implemented some type of *ex ante* review of financial innovation (and incorporated the precautionary standard set out in Section 3.B.), financial innovations would be seen as presumptively problematic for financial stability. Financial institutions would then seek to rebut this presumption by demonstrating the capital intermediation and/or risk management benefits of the proposed innovation. Regulators would use a two-step inquiry to evaluate proposals for new financial innovations:

- first, does the innovation actually improve capital intermediation and/or risk management in a socially-utile way; and

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[180] "A CDS is a derivative instrument that allows the purchaser of the instrument to buy protection with respect to an underlying debt instrument (the "reference obligation"). . . The buyer of the CDS pays a fixed premium (also known as the "spread") to the seller of the CDS over a fixed period in return for a promise by the seller to pay a fixed amount to the buyer if a "credit event" (such as a failure to pay, a bankruptcy, or a downgrade by a credit rating agency) occurs with respect to the "reference entity" that issued the reference obligation." Allen, *supra* Note 52 at 153.

[181] Kathleen C. Engel and Thomas James Fitzpatrick IV, *Complexity, Complicity, and Liability up the Securitization Food Chain: Investor and Arranger Exposure to Consumer Claims*, pages 3-4 (available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1951187)

[182] For further detail, *see* text accompanying Notes 251-250.

[183] Patricia A. McCoy, Andrey D. Pavlov & Susan M. Wachter, *Systemic Risk Through Securitization: The Result of Deregulation and Regulatory Failure*, 41 CONN. L. REV. 1327, 1332 (2008-2009).

- second, if the innovation does improve capital intermediation and/or risk management, is that improvement sufficient to justify any risks to financial stability posed by the innovation.[184]

Such an approach implicitly uses the end goal of broader economic prosperity (being the sustainable growth of the economy as a whole, not just of the financial sector) as its yardstick.

i. The Social Utility of Financial Innovation

Turning first to the social utility of financial innovation, it is often assumed that innovation is inherently good, because it completes markets in response to genuine market demand for new types of capital intermediation and/or risk management.[185] While this is sometimes true, authors like Turner and Awrey have challenged the proposition that this is *always* the case (and hence that innovation is *always* socially utile).[186] Turner has focused on the rapid pace of financial innovation in recent years, and concluded that "while there clearly is an economic value in market completion, it must be subject to diminishing marginal return. That beyond some point, the additional welfare benefit of providing ever more tailored combinations of risk, return and liquidity must become minimal."[187]

Awrey's position is that some financial innovations are driven by the financial institutions that *supply* financial innovations, rather than by any investor demand or market need.[188] Awrey argues that financial institutions

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[184] Adair Turner has articulated a similar framework for evaluating financial activity: "A crucial issue is therefore whether this increased financial intensity has delivered value added for the real economy – whether it has improved capital allocation, increased growth, or increased human welfare and choice in ways which do not show up in growth rates. And whether it has made the economy more or less volatile and vulnerable to shocks." Turner, *supra* Note 28 at 6.

[185] "Innovation in financial intermediation improves efficiency by completing markets, lowering transaction costs, and reducing agency costs." Merton, *supra* Note 24 at 36. Adair Turner describes the ideological background to this position as follows: "the recently dominant neoclassical school of economics . . . has provided strong support for the belief that increased financial activity – financial deepening, innovation, active trading and increased liquidity – must be a broadly positive development. This is because more financial activity helps complete markets. . . the more that innovation allows investors to choose precise combinations of risk, return and liquidity and the more that trading activity generates market liquidity, the more efficient an welfare-maximising must the economy be." Turner, *supra* Note 28.

[186] Awrey, *supra* Note 51; Turner, *supra* Note 28.

[187] Turner, *supra* Note 28 at 22.

[188] Awrey, *supra* Note 51 at 35 et seq. In a similar vein, Haldane & May have argued that even in the absence of true investor demand for risk management instruments "[s]o long as there is an incentive to supply new instruments – a positive premium to trading – banks will continue to expand gross positions, independent of true hedging demand from non-banks. Such trades are essentially redundant, increasing the dimensionality and complexity of the

want a long-term monopoly on the profits of the innovations they develop, but most financial innovations are not covered by any intellectual property-type protection that guarantees such a monopoly.[189] Financial institutions can attempt to keep the details of their innovations secret from other financial institutions, but bankers move from firm to firm and product knowledge can be reverse engineered, so it is difficult to maintain a competitive edge on new products.[190] One way for a financial institution to maximize monopoly profits is to push new products through as quickly as possible (perhaps without fully testing them), to prolong the narrow period of time during which the institution has no competition and can thus charge higher fees.[191] Another way for financial institutions to maintain a competitive advantage for their innovations is to make those innovations overly complicated, such that they are harder to reverse engineer or commoditize[192] (this latter strategy also enables financial institutions to charge a premium on their analysis and dealer functions:[193] where a product is so complex that only the developer can understand it, the developer will be the only source of information regarding that product, and the only entity that can arrange deals involving that product). Another way to maximize monopoly profits is to repeatedly introduce into the market tweaked versions of existing products: "[t]his strategy does not necessarily rely on the existence of any natural demand in the marketplace, nor on the innovation itself being "new" in any material respect. Rather, it can theoretically be premised on little more than tapping the instinctive human desire for the 'next new thing'."[194]

While such supply-driven innovations are immediately beneficial for the financial institutions that generate fees selling the new financial instruments, they do not necessarily improve capital intermediation or risk management for the broader economy. Regulation that stifles purely supply-driven innovations will not be socially damaging. But even where innovations are driven by genuine investor demand, they may not have social utility. For example, some innovations that purport to improve risk management are in fact designed to concentrate risk with investors who do not truly appreciate the risk that they are taking on:[195] investors often seek investments that are capable of increased return without a commensurate

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network at a cost in terms of stability, with no welfare gain because market completeness has already been achieved." Haldane & May, *supra* Note 74 at 352.

[189] Awrey, *supra* Note 51 at 38-39.

[190] *Id*. at 6; 34. Rajan notes that "excess returns in more traditional investments have been competed away." Rajan, *supra* Note 12 at 324.

[191] Hu, *supra* Note 15, at 1479. For a discussion of the ability of financial institutions to be able to charge an "innovation premium" for a new product, *see* Utset, *supra* Note 24 at 803.

[192] Awrey, *supra* Note 51 at 35-36. For a discussion of the incentives for financial institutions to increase the level of complexity, *see* Utset, *supra* Note 24 at 828.

[193] Awrey, *supra* Note 51 at 36.

[194] *Id*. at 35.

[195] Gennaioli et al., *supra* Note 15, at 2.

increase in risk, but a higher return usually does require higher risk.[196] To satisfy demand for seemingly higher-yield, lower-risk products, financial institutions often use financial engineering to consolidate risk in the tail[197] where investors are notoriously likely to disregard it (both because of a human tendency to ignore tail risk,[198] and because tail risk is often discounted by mathematical models like VaR that are widely used by financial institutions to calculate their potential risk exposure).[199] Where investors do not properly recognize the tail risk inherent in a financial instrument, they are likely to accept a yield that does not properly compensate them for the risk they are taking on,[200] and the instrument is likely to be wildly popular (just as MBSs were, prior to the Financial Crisis),[201] being "over-issued relative to what would be possible under rational expectations."[202] Where an innovation is designed to obfuscate

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[196] "[S]omehow in the effort to define, separate and diffuse those risks, with its familiar slogan of "slicing and dicing", sight was lost of the fact that this risk ultimately remained, however much it was relocated and re-priced. In fact, risk sometimes ended up in new concentrations, hidden from the view of supervisors, and too often from boards of directors and even top executives." Volcker, *supra* Note 29 at 3.

[197] This means that the chance that the risk will come to fruition is low, but if it does come to fruition, it is likely to have significant negative consequences. Rajan notes that "Typically, the kinds of risks that can be concealed most easily . . . are risk that generate severe adverse consequences with small probability but, in return offer generous compensation the rest of the time." Rajan, *supra* Note 12 at 316. See also Gennaioli et al., *supra* Note 15, at 2.

[198] See Note 141 and accompanying text.

[199] VaR, or value-at-risk, is a model for calculating how much a financial institution stands to lose on its investments on any given day at a given confidence level. For a detailed discussion of VaR, *see* Whitehead, *supra* Note 144 at 341-346; 362-364. Most financial institutions use a form of the VaR model (although each institution tweaks their VaR model somewhat), which allows each institution to generate a number that is said to represent its risk at any particular time. However, the VaR model relies on historical data to calculate future risk – "VaR estimates future losses based on the assumption that the market will perform in the future as it performed in the past". Kristin N. Johnson, *Addressing Gaps in the Dodd-Frank Act: Directors' Risk Management Oversight Obligations*, 45 U. Mich. J. L. Reform 55, 71 (2011). As such, VaR discounts low probability losses that are not reflected in historical data (what constitutes "low probability" varies from model to model, depending on the historical data inputted and the institution's confidence level) and therefore the model does not generate an entirely accurate summation of an institution's risk profile. For further discussion, see Peter Conti-Brown, *A Proposed Fat-Tail Risk Metric: Disclosures, Derivatives and the Measurement of Financial Risk*, 87 WASH. U. L. REV. 1461, 1462–65 (2010).

[200] For further discussion, see Gennaioli et al., *supra* Note 15, at 31.

[201] MBSs are generated by applying financial engineering to a pool of mortgages so as to generate different levels or "tranches" of securities – some riskier than others – from the same asset pool. Prior to the Financial Crisis, MBSs were structured such that the top tranches appeared to be risk free and received the highest possible AAA credit rating (equivalent to U.S. government bonds). The hidden risk inherent in the top tranches of MBSs only became evident during the tail event that was the Financial Crisis, when these AAA-rated "super-safe" tranches proved to be much, much riskier than U.S. government bonds. McCoy et al., *supra* Note 183 at 1331-1332.

[202] Gennaioli et al., *supra* Note 15, at 5. Such behavior was clearly evident with regard to derivatives in the lead-up to the Financial Crisis – "[i]n the absence of regulatory oversight,

information about the risks being purchased by an investor, the innovation is tricking the investor rather than allowing for informed risk allocation, and regulation that chills such innovations will not be socially costly.

ii. How Financial Innovations Create Systemic Risk

In the absence of any social utility to recommend innovations, regulation limiting such innovations poses little cost to society and should be implemented. However, when innovations are created in response to a genuine investor demand, and do make a clear contribution to capital intermediation or risk management, we must turn to the second step of our precautionary inquiry and consider whether those contributions justify any systemic risks posed by the innovation. Of course, given the complexities involved in determining how the financial system will react to the introduction of a new type of product, it is impossible to answer this question definitively. To some extent, the conclusions drawn by regulators in this second step will reflect value judgments about the importance of preserving systemic stability, as well as value judgments about the benefits of an innovation that might be foregone if that innovation is banned or otherwise regulated. Such determinations of potential systemic risk are not completely unscientific, however: the experience of the Financial Crisis gives us some indication of how financial innovations might create systemic risk.

First, financial innovation, which introduces both new actors and new instruments into the financial system,[203] compounds the complexity of the financial system.[204] Complexity can threaten financial stability because it increases the interconnectedness of market participants and the speed with which shocks can be transmitted through the financial system.[205] Market

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the eventual innovation frenzy would later fuel a boom beyond all bounds of rational constraint – or self-discipline." GILLIAN TETT, FOOL'S GOLD, 40 (2009). If credit rating agencies are influenced by the same cognitive biases and financial models as the rest of the financial markets, they may be equally irrational in evaluating the risks posed by a financial instrument and assign that instrument a credit rating that does not reflect its real risk profile. With a high credit rating, the instrument will be more readily accepted as collateral between counterparties and this will further increase the popularity of the instrument.

[203] Merton, *supra* Note 24 at 28; *See* Litan, *supra* Note 15 at 5.

[204] Awrey, *supra* Note 51 at 8. Similar comments have been made with regard to ecosystems – as more linkages between species are introduced into an ecosystem and those linkages intensify, the stability of that ecosystem is compromised. Haldane & May, *supra* Note 74 at 351.

[205] "[T]he vast array of intricate, evolving and often undetected interconnections within and between markets and institutions – themselves often the byproducts of financial innovation – foment systemic fragility and manifest the potential to become channels for the transmission of contagion during periods of market distress." Awrey, *supra* Note 51 at 48. "In a complex system, signals are sometimes inadvertently transmitted too quickly to control." Schwarcz, *Regulating Complexity*, *supra* Note 19 at 215.

participants must therefore make decisions very quickly[206] which leaves little time for reflection, and so increases reliance on common shortcuts like heuristics and computer models, in place of an informed and reasoned opinion of the underlying risk and value of the product.[207] The complexity of the products themselves also encourages reliance on these same shortcuts,[208] particularly if products are new, unfamiliar and untested.[209] Given that heuristics and computer models tend to underestimate low-probability high-impact tail events (such as loss of liquidity) in similar ways,[210] broad-based reliance on such shortcuts correlates the behavior of actors in the financial system, and makes the system more vulnerable to bubbles and panics.[211]

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[206] "Technological innovations, the removal of regulatory barriers to entry, and use of securitization and other financial products to create deeper and more liquid credit markets, have greatly magnified the importance of acting quickly." Utset, *supra* Note 24 at 802.

[207] "Investment analysts may well be able to intuit risk, but – with limited time available to devote to risk assessment – a firm's senior managers often want risk to be modeled and reduced to usable numbers." Schwarcz, *Regulating Complexity*, *supra* Note 19 at 224. This is exacerbated by the automation of the financial process, where computers are programmed to trade based on certain algorithms without the intervention of any human judgment. *Id*. at 232. *See* also Utset, *supra* Note 24 at 827.

[208] "As the complexity of financial products increased, fewer analysts possessed sufficiently nuanced cognition to properly understand and price the products. Trying to do their jobs, many analysts made oversimplifications usually on the optimistic side because the economy was expanding. To some extent, these simplifications involved overreliance on heuristics." Schwarcz, *Regulating Complexity*, *supra* Note 19 at 223. *See* also Utset, *supra* Note 24 at 783; Awrey, *supra* Note 51 at 9; Dana, *supra* Note 14 at 1332; Rajan, *supra* Note 12 at 343 (more complicated instruments are capable of generating more uncertainty).

[209] Posner & Weyl argue that "new products are usually the most harmful: since market participants have had little opportunity to adapt to them, they create the greatest confusion and opportunity for regulatory arbitrage." Posner & Weyl, *supra* Note 153, at 40. Gennaioli et al. have identified a connection between "financial innovation, the glut of new securities, surprise about risk, and corresponding financial fragility." Gennaioli et al., *supra* Note 15, at 6.

[210] *See* Rajan, *supra* Note 12 at 343; Gennaioli et al., *supra* Note 15, at 4.

[211] In a good economy, the most recent and salient events for investors will all be positive, and investors will not have any bad experience with the innovative new product to draw upon. The result is that estimation of the product will derive less from a reasoned consideration of its fundamentals, and more from optimistic cognitive shortcuts which undervalue the potential for associated tail risks to come to fruition. However, the effect of salient bad news will also be multiplied by these same shortcuts, and bad news that focuses the collective imagination on the tail risks inherent in the new product has the potential to cause a loss of confidence in, and panic about, that product. As a result, market discipline on financial institutions is rarely measured and often takes the form of panic and runs: Admati et al. refer to this as an "inefficient destruction of asset values." Anat R. Admati, Peter M. DeMarzo, Martin F. Hellwig and Paul Pfleiderer, *Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Expensive*, (draft dated September 10, 2010) at page 28. Gennaioli et al., *supra* Note 15, at 15. "Where the informational costs are too great, the resulting uncertainty can lead to panic and the mass withdrawal of liquidity from the financial system." Awrey, *supra* Note 51 at 48 (Note 201). Alternatively, if the value an investor places on a product derives more from understanding and information and less from the cognitive and computer-based shortcuts that are necessary when dealing with a truly complex product, the product (and the system as a

When such a tail event does occur, market participants are likely to panic and sell their holdings of innovative new products (and other less liquid investments) so as to move to more reliable, liquid and transparent assets.[212] So-called "fire sales" of products are likely to be destructive of their value, especially when there is not a deep liquid market for them.[213] To the extent that there is a market for these products, the financial institutions that originated the products are the natural buyers,[214] and so these institutions will end up bringing many of these products onto their balance sheets even as the value of such products decreases. Furthermore, these originating financial institutions are likely to have retained the riskiest versions of their products on their balance sheets from the outset,[215] which means that they will have significant exposure to tail risks even prior to buying back any products from other market participants. Financial institutions will therefore bear the greatest losses with respect to innovative new products during tail events, and these losses will impede the ability of such financial institutions to engage in socially useful capital intermediation and risk management functions in the long run.[216]

In addition to increasing complexity, innovations that allow for improved risk allocation may prove problematic for financial stability if they increase the amount,[217] or obscure the allocation,[218] of risk within the financial system (CDSs were certainly guilty of this during the Financial

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whole) will be less susceptible to irrational losses in confidence. Reinhart & Rogoff, *supra* Note 25 at xliv.

[212] Rajan, *supra* Note 12 at 346.

[213] Gennaioli et al., *supra* Note 15, at 24.

[214] Gennaioli et al., *supra* Note 15, at 2. In some instances this may be done for reputational reasons, or it may be a contractual obligation of the banks. For example, prior to the Financial Crisis, Citibank issued CDOs which had a "liquidity put". This liquidity put allowed buyers of those instruments to require Citibank to buy them back, should the instruments fail to meet certain performance criteria. *See* Johnson, *supra* Note 199 at 77. More generally, banks are the traditional providers of liquidity to the market. Rajan, *supra* Note 12 at 346.

[215] Rajan, *supra* Note 12 at 326. This is especially likely to have occurred if regulators were also blinded to the real risks of the innovation and accepted low risk-weightings for the instruments for the purposes of calculating regulatory capital requirements.

[216] "Depressed security prices can have especially adverse welfare consequences ex post because they cut off lending to new investment. A financial crisis leads to an economic crisis." Gennaioli et al., *supra* Note 15, at 36.

[217] "Instead of reducing bank risk, risk transfer allows the bank to concentrate on risks so that it has a comparative advantage in managing, making optimal use of its capital while hiving off the rest to those who have a natural appetite for it or to those with balance sheets large enough or transparent enough to absorb those risks passively. It also implies that the risk held on the balance sheet is only the tip of the iceberg of risk that is being created." Rajan, *supra* Note 12 at 327.

[218] *See*, for example, Haldane's and May's discussion of the literature relating to the destabilizing effects of hedging instruments like derivatives. Haldane & May, *supra* Note 74 at 351-352; Awrey, *supra* Note 51 at 21.

Crisis).[219] With regard to recent innovations in capital intermediation, many of these have facilitated capital intermediation within the financial sector, rather than to the broader economy.[220] In particular, these innovations have the potential to inflate harmful real estate bubbles by channeling credit flows to non-productive investments such as residential and commercial property:[221] only a portion of this credit goes toward building new properties, and the remainder is invested in existing properties in expectation of asset appreciation and in order to maximize tax incentives for debt.[222] This latter type of investment does not provide the same kind of socially productive growth as credit flows that permit other types of investment and trade,[223] and can fuel real estate bubbles that jeopardize systemic stability[224] – just as MBSs did in the lead-up to the Financial Crisis.[225]

Drawing these threads together, a precautionary evaluation of a new innovation must weigh on one side the benefit provided by that innovation in terms of improving socially utile capital intermediation and risk management, and on the other side any indicia of systemic risk suggested by the new innovation. These indicia include (and this is by no means an exhaustive list): (i) the extent to which the innovation increases complexity, (ii) the extent to which the innovation multiplies the amount of risk in the system, (iii) the extent to which the innovation obscures the allocation of risk and capital in the financial system, and (iv) the extent to which the innovation channels capital to what are, on balance, non-productive investments (especially in real estate). Some of these indicia of systemic risk could perhaps be dealt with using more traditional regulatory tools: for example, risk multiplication might be dealt with by way of increased capital requirements (or other limitations on leverage), and concerns about hidden risk might be dealt with in part by mandating disclosure. Real estate and other asset bubbles could perhaps be addressed by adjusting interest rates or tax incentives. However, by trying to tailor regulatory solutions too narrowly to each of the individual problems posed by financial innovation, we may develop solutions that are inferior to an *ex ante* precautionary review scheme:[226] concerns about increases in complexity can only really be

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[219] Utset, *supra* Note 24 at 825. *See* also text accompanying Notes 251-250.
[220] "Perhaps as much as two-thirds of the spectacular growth in banks' balance sheet over recent decades reflected increasing claims within the financial system, rather than with non-financial agents." Haldane & May, *supra* Note 74 at 351.
[221] Turner, *supra* Note 28 at 17.
[222] *Id.*
[223] *Id.*
[224] Over the years, a large number of financial crises appear to have been precipitated by real estate bubbles. *See* Reinhart & Rogoff, *supra* Note 25 at 158-162.
[225] McCoy et al., *supra* Note 183 at 1332.
[226] Haldane & Madouros, *supra* Note 47 at 23, suggest that when dealing with complex systems, simpler regulations are often more effective than rules that seek to cater to each possible eventuality.

dealt with by controlling the introduction of new innovations into the financial system.[227]

C. Ancillary Benefits of a Precautionary Approach to Financial Innovation

If precautionary *ex ante* vetting of financial innovation were introduced, financial institutions would bear the burden of demonstrating that a financial innovation should be cleared for issuance. This would alleviate regulatory resource constraints by requiring a financial institution to approach the financial regulator with all the relevant information about its new product, rather than the regulator scrambling to keep up with the innovation process of its regulated constituency.[228] The regulator would therefore have more timely information and a broader view of the use of new products in the financial system.[229] Regulators could also require an innovator to conduct stress tests and consider the systemic consequences of any new financial product[230] and present their findings to the regulator: in this way, financial institutions would be forced to internalize some of the costs of evaluating and testing their new products.[231]

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[227] While regulators should consider an array of regulatory approaches to financial innovation, they should retain the right to ban a product that has no demonstrable social utility, poses too much systemic risk, or is simply too complex to understand. Pan, *supra* Note 33, at 45. An outright ban is likely to be more economical for regulators than trying to understand the issues posed by a complex product and attempting to tailor appropriate disclosure, clearing, capital, etc. requirements to it (and then supervising compliance with such requirements). *Id*. at 43-45. Furthermore, blunt regulatory action can reduce compliance costs (and provide certainty) for the regulated industry. *Id*. at 24-25.

[228] Dan Awrey notes that "the pace of innovation has left financial regulators and regulation chronically behind the curve." Awrey, *supra* Note 51 at 4. Of course, even with an *ex ante* approval regime, regulators would still need to devote resources to enforcing the regulatory requirement that no new product be introduced without regulatory approval.

[229] An argument could be made that it would be sufficient to mandate that financial institutions make disclosures about their new products to regulators. Regulators could then make systemic risk determinations based on that information. However, as Omarova argues, "Without a clear threat of regulatory prohibition on the proposed activity, financial institutions that stand to gain much profit from that activity will be less forthcoming with the relevant information. In the context of a purely information-gathering review, it would be more difficult for the regulators to justify their demands for further disclosure and discussions, over the firms' complaints about unnecessary and meaningless delays. Routinely issued pre-market regulatory comments on potential risks of individual financial products, without any binding legal power, are likely to be ignored by market participants and even the regulators themselves, especially in times of rising asset prices." Omarova, *supra* Note 73, at 75.

[230] It should be noted that stress tests are not a foolproof method of determining how an innovative financial product will behave in the future: stress tests can also neglect tail events in their simulations. For further discussion of the limitations of stress testing, *see* Johnson, *supra* Note 199 at 74.

[231] "[P]roponents of the precautionary approach perceive it to be a mechanism for reforming public and private institutions, such that the burden of uncertainty regarding industrial substances, technologies and processes is distributed in a manner that is believed to be more equitable, more conducive to the development of vital risk information, and ultimately, more socially desirable." Kysar, *supra* Note 14 at 238.

Of course, if regulators are receiving information about financial innovation from the financial industry, there is always the concern that regulators will prioritize that information over information received from other sources (i.e. that regulators will be captured by the concerns of the financial industry). However, a precautionary *ex ante* review procedure would mitigate the potential for capture in a number of ways. First, it seems that once financial products become well-established in the marketplace, regulators are less likely to want to interfere with such products.[232] Because precautionary review would occur prior to the introduction of a new financial product into the market, regulators would be less likely to see an innovative product as a fait accompli, and thus would be more willing to oppose the product (or at least less likely to endorse it).[233] A precautionary approach would also help combat the tendency towards capture by directing regulators to think more broadly and creatively about the long-term costs and benefits of a particular financial innovation (including costs and benefits for stakeholders outside of the financial industry).[234] Finally, in the face of financial industry opposition, statutes requiring financial regulators to take a precautionary approach would enable those regulators to point to a mandate that authorizes regulating for financial stability, even in the absence of empirical proof of danger posed by the innovation.

The burden shifting effected by a precautionary approach is also likely to incentivize desirable behaviors from financial institutions. In the absence of a precautionary review system, financial institutions have incentives to rush new products out, and do not have incentives to fully consider the downsides of their products.[235] However, if a financial institution knows that it will need to explain or justify a product to a regulator, but does not think it will be able do so because the product is overly complicated or poses too much systemic risk, the financial institution may abandon or simplify the product without any regulatory instruction to do so (a regulatory review process will involve time and cost, and a financial institution will be loath to commence such a process with a product

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[232] Kenneth C. Kettering, *Securitization and its Discontents: The Dynamics of Financial Product Development*, 29 CARDOZO L. REV. 1553, 1650 (2007-2008).

[233] Kettering uses the repurchase agreement as an example of a financial product that became so prevalent that the Federal Reserve lobbied legislatures to amend the Bankruptcy Code in 1984 to ensure that use of the product was protected. *Id*. at 1642; 1645 (2007-2008). Similarly, federal financial regulators supported (and in some cases, initiated) legislative provisions to exempt over-the-counter derivatives from the Bankruptcy Code's automatic stay, which further encouraged their growth. *Id*. at 1648; 1651

[234] Dana, *supra* Note 14.

[235] Hu, *supra* Note 15, at 1482. "[F]irms deciding whether to allocate more analyst time or hire additional experts to analyze possible investments might view the added tangible costs as outweighing the uncertain gain." Schwarcz, *Regulating Complexity*, *supra* Note 19 at 221-222.

that does not seem likely to pass muster).[236] Furthermore, the time taken by the regulatory review process effectively inserts a "speed bump" into the innovation process and erodes the innovation premium on a new product, leaving less incentive to introduce a new product into the financial system in the first place.[237] Precautionary regulation may thus cause a financial institution to abandon an innovation when it has little to offer but its "newness": this is a desirable outcome, because having fewer and simpler products in the financial system will reduce the complexity of both the financial system, and the financial regulatory regime that is put in place to police it.[238]

D. Regulation of CDSs in a Parallel Precautionary Universe

This Section takes the foregoing theoretical discussion about a precautionary *ex ante* review process for financial innovation, and puts it into a more practical context by considering how such a review process would have treated CDSs, had it been in place when CDSs were first developed in the early 1990s.[239] Before the Financial Crisis, the CDS was heralded by most as "a mechanism for transferring risk efficiently around the system",[240] and attempts to regulate it were staunchly rebuffed.[241] As the Crisis unfolded, however, the CDS became broadly vilified as a "weapon of mass destruction,"[242] and calls to regulate CDSs intensified and culminated in the enactment of Dodd-Frank, Title VII of which deals with the regulation of over-the-counter ("OTC") swaps (including CDSs). A brief sketch of the history of swaps regulation in the United States suggests

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[236] In discussing some of the benefits of forcing banks to disclose to regulators detailed information about their derivatives positions, Henry Hu noted that it "would force banks to confront weaknesses in their pricing, risk assessment and hedging systems." Hu, *supra* Note 15, at 1507. The requirement in Dodd-Frank that systemically important financial institutions develop "living wills" has similar salutary effects – because the institutions are forced to explain their structure and risk profile to regulators, they develop a better understanding of it themselves, and may restructure unbidden. *See* Richard J. Herring, *Wind-Down Plans as an Alternative to Bailouts: The Cross Border Challengers*, *in* ENDING BAILOUTS AS WE KNOW THEM 125, 141 (Kenneth E. Scott et al. eds., 2009), *available at* http://fic.wharton.upenn.edu/fic/papers/10/10-08.pdf.

[237] See Note 191 and accompanying text.

[238] See the text accompanying Notes 203-211.

[239] For a discussion of the development of CDSs, see Tett, *supra* Note 202 at 46-56.

[240] Tim Frost, former European Head of Credit Trading, Sales and Research at JPMorgan, as cited in Tett, *supra* Note 202 at 86.

[241] See Notes 243-244 and accompanying text.

[242] Warren Buffett famously used this phrase to describe derivatives in a 2002 letter to Berkshire Hathaway investors: "derivatives are financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal." Once the financial sector began to meltdown in 2008, Buffett's words were cited increasingly often with respect to CDSs. See, for example, Ben Stein, *In Financial Food Chains, Little Guys Can't Win*, N.Y. TIMES (September 27, 2008) (available at http://www.nytimes.com/2008/09/28/business/28every.html?fta=y); CBS News, *The Bet That Blew Up Wall Street* (Oct 26, 2008) (available at http://www.cbsnews.com/stories/2008/10/26/60minutes/main4546199.shtml).

how a precautionary approach to the regulation of swaps might have mitigated the damage done by CDSs during the Financial Crisis.

In May of 1998, Brooksley Born, Chairperson of the Commodity Futures Trading Commission, issued a concept release seeking input regarding the regulation of CDSs and other OTC derivatives. The press release accompanying the concept release stated:

> *While OTC derivatives serve important economic functions, these products, like any complex financial instrument, can present significant risks if misused or misunderstood. A number of large, well-publicized financial losses over the last few years have focused the attention of the financial services industry, its regulators, derivatives end-users and the general public on potential problems and abuses in the OTC derivatives market. Many of these losses have come to light since the CFTC's last major OTC derivatives regulatory actions in 1993.*
>
> *In view of these developments, the Commission believes it is appropriate to review its regulatory approach to OTC derivatives. The goal of this reexamination is to assist it in determining how best to maintain adequate regulatory safeguards without impairing the ability of the OTC derivatives market to grow and the ability of U.S. entities to remain competitive in the global financial marketplace. In that context, the Commission is open both to evidence in support of broadening its existing exemptions and to evidence of the need for additional safeguards. Thus, the concept release identifies a broad range of issues in order to stimulate public discussion and elicit informed analysis. The Commission seeks to draw on the knowledge and expertise of a broad spectrum of interested parties, including OTC derivatives dealers, end-users of derivatives, other industry participants, other regulatory authorities, and academicians*.[243]

This press release is certainly mindful of the costs of regulation (seeking not to impair the growth of the OTC derivatives market or United States competitiveness), but it is also somewhat precautionary, in that it is concerned with the significant unknown risks that might result from the misuse or misunderstanding of OTC derivatives. Furthermore, the press release seeks viewpoints from both within and outside of the regulated industry, in accordance with the broader interest perspective dictated by the precautionary principle. However, there is no attempt to require the financial industry to show that regulation is unnecessary – the CFTC clearly means to retain the burden of showing that regulation is necessary, and

[243] CFTC, *CFTC Issues Concept Release Concerning Over-The-Counter Derivatives Market*, PR 4142-98 (May 7, 1998) (available at http://www.cftc.gov/opa/press98/opa4142-98.htm)

accordingly, this press release could only be construed as being informed by a weak version of the precautionary principle. However, the CFTC faced significant backlash over this concept release: the application of even a weakly precautionary approach to OTC derivatives was harshly and publicly condemned by the industry, and more unusually, by other regulators, who believed that the derivatives markets were so efficient and sophisticated that no government intervention was necessary.[244] The result was that CDSs and other OTC derivatives remained largely unregulated prior to the Financial Crisis.

It appears that regulatory capture at least partially informed the decision not to regulate OTC derivatives. In an interview with the Financial Crisis Inquiry Commission, Former Treasury Secretary Robert Rubin stated that he was not personally opposed to regulation of OTC derivatives, but that "very strongly held views in the financial services industry in opposition to regulation" could not be overcome.[245] In contrast, had precautionary legislation been enacted prior to the development of CDSs, the default position with regard to financial innovation would have been to regulate it. Financial industry members seeking to avoid regulation of CDSs would therefore have had to take an adversarial position against the CFTC, essentially having to challenge it, rather than just co-opt it. In our parallel precautionary universe, the CFTC would not have presumed CDSs to be beneficial just because they facilitated risk management. The CFTC would also have considered the *way* CDSs facilitated risk management, and whether CDSs obscured real risk allocations in a way that threatened financial stability:[246] in effect the CFTC would have been directed to act as advocate for those who had a stake in financial stability but could not influence the rulemaking process because of collective action problems.[247]

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[244] The Treasury Secretary, Chairman of the SEC and the Chairman of the Federal Reserve all publicly criticized the CFTC's attempts to revisit regulation of OTC derivatives in 1998. Chairman of the Federal Reserve Alan Greenspan went so far as to say that "[a]side from safety and soundness regulation of derivatives dealers under the banking and securities laws, regulation of derivatives transactions that are privately negotiated by professionals is unnecessary." FCIC Report, *supra* Note 2, at 47.

[245] FCIC Report, *supra* Note 2, at 49. This response can perhaps be explained by the theory posited by Kettering that financial product classes themselves can become "too big to fail": essentially, when use of a financial product has grown so that it has a very large market presence, there is insufficient political will on the part of regulators to shackle further growth or profitability of that financial product. Kettering, *supra* Note 232 at 1645 (2007-2008).

[246] Discussing CDSs, Utset comments that they "allowed institutions to insure against contract-specific and firm-specific counterparty risks and, therefore, increased their ability to transact blindly." Utset, *supra* Note 24 at 825.

[247] While the CFTC's instinct was to seek some input from persons outside of the financial industry (such as other regulators and academics) with regard to whether over-the-counter derivatives should be regulated, our precautionary approach would have directed the CFTC to go further in considering the views of non-represented stakeholders. CFTC, *CFTC Issues Concept Release Concerning Over-The-Counter Derivatives Market*, PR 4142-98 (May 7, 1998) (available at http://www.cftc.gov/opa/press98/opa4142-98.htm).

Because a precautionary approach shifts the onus to the regulated industry to demonstrate that regulation is unnecessary, and because regulators would have started from the position that innovations like CDSs create complex and unknowable interactions within the financial system, if a precautionary philosophy had applied at the time CDSs were first introduced to the market, it is highly unlikely that the industry would have been able to entirely avoid regulation of CDSs. Of course, there is no way of knowing what form regulation of CDSs would have taken in a parallel precautionary universe. But *any* regulation would likely have addressed one of the key problems posed by CDSs in the Financial Crisis: their multiplier effect. This multiplier effect arises because a CDS is an instrument that derives its value from an underlying debt instrument, but the purchaser of the CDS is not required to have any interest in the underlying debt instrument.[248] Prior to the Financial Crisis, the only limitation on the number of CDSs that could derive their value from a single debt instrument was the willingness of CDS sellers to issue those CDSs, and because sellers received immediate income flows from CDS premiums and were not required to hold capital or any other reserve against their CDS positions,[249] they had little incentive to stop issuing CDSs.[250] This meant that investors could purchase almost unlimited CDSs that derived their value from one single debt instrument: if that debt instrument defaulted, payment obligations under numerous CDSs would be triggered, multiplying exponentially the amount of market exposure to the default by the issuer of that underlying debt instrument.[251]

In a parallel precautionary universe, had there been a requirement that CDS purchasers have an "insurable interest" in the underlying debt instrument,[252] or any regulatory capital or margin requirements for CDSs, such measures would almost certainly have reduced the number of these instruments in the market, and therefore put some limit on the multiplier effect of CDSs and the level of interconnectedness of financial market participants. As an alternative or a complement to such regulatory requirements, Johnson has argued that had mandatory clearing of CDSs been required prior to the Financial Crisis, it would have limited the number of CDSs issued.[253] Mandatory clearing would also have improved the

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[248] FCIC Report, *supra* Note 2, at 50.

[249] "AIG, the largest U.S. insurance company, would accumulate a one-half trillion dollar position in credit risk through the OTC market without being required to post one dollar's worth of initial collateral or making any other provision for loss." FCIC Report, *supra* Note 2, at 50.

[250] Richard Portes, *Ban Naked CDS* (March 18, 2010) (available at http://economistsview.typepad.com/economistsview/2010/03/ban-naked-cds.html)

[251] *See* JOHN GEANAKOPLOS, SOLVING THE PRESENT CRISIS AND MANAGING THE LEVERAGE CYCLE 16 (2009), *available at* http://fcic-static.law.stanford.edu/cdn_media/fcic-testimony/2010-0226-Geanakoplos.pdf

[252] Posner & Weyl, *supra* Note 153, at 23.

[253] "[I]f market participants had been required to clear credit default swap transactions during the years before the crisis, it is unlikely that AIG would have entered into such a

transparency of CDS markets prior to the Financial Crisis: in the absence of any such clearing or disclosure requirements, regulators had no informed idea of the extent to which financial institutions were linked to each other by CDS exposures, nor did they know whether interconnected parties could net out their notional CDS exposures. This made it very difficult for regulators to predict the systemic consequences of the failure of a large derivatives counterparty like AIG or Lehman Brothers – this opacity also spooked private investors. Any regulation mandating clearing or disclosure with respect to CDSs would have improved the informational situation for both regulators and regulated, reducing to at least some degree their susceptibility to panic.

It seems, then, that had CDSs been regulated from the outset, there would have been less leverage and more transparency in the financial system. Of course, there would also have been some costs associated with such regulation. Most obviously, the fees earned by the major derivatives dealers were very lucrative, and some of these would most certainly been forfeit had derivatives been regulated. However, this private cost might actually have improved systemic stability: to fully participate in the financial innovation process, institutions tend to need strong institutional customer relationships and large amounts of capital.[254] As a result, only a small number of players could truly reap the rewards of innovating derivatives,[255] and those rewards contributed to the increasing size of those players: without fees from derivatives dealing, the growth of "too big to fail" financial institutions might have been impeded. The private costs of CDS regulation would therefore not have given our parallel universe regulators too much pause, but the public cost of regulation – being the cost associated with limiting the use of CDSs as a tool for risk management – would have been something that regulators needed to weigh seriously.

The social utility of CDSs as risk management tools is a subject of hot debate. Some take the view that CDSs were a groundbreaking innovation in risk management, in that they allow people to hedge exposure to thinly-traded debt instruments that would otherwise be very difficult to hedge.[256] CDS advocates argue that even speculative use of CDSs (i.e. "naked" CDSs, where the purchaser of the CDS has no exposure to the underlying debt instrument) is beneficial because it provides liquidity and serves an informational signaling function.[257] In contrast, detractors view the utility of CDSs as a hedging tool more skeptically, concluding that the

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significant volume of credit default swap agreements acting as a protection seller without triggering at least an investigation into its collateral accounting policies and its ability to satisfy obligations under the agreements." Kristin N. Johnson, *Things Fall Apart: Regulating the Credit Default Swap Commons*, 82 U. COLO. L. REV. 167, 238 (2011).

[254] Rajan, *supra* Note 12 at 330-331.

[255] FCIC Report, *supra* Note 2, at 50.

[256] Litan, *supra* Note 15 at 41-42.

[257] *Id.*

instrument is devoid of any real use other than antisocial speculation.[258] Others take the middle ground, and believe that "covered" CDSs that are used for hedging are a useful innovation, whereas naked CDSs have no social utility and should be banned.[259] In our parallel precautionary universe, the CFTC would have had to consider all of these opinions and make an informed value judgment about the utility of CDSs.

It is by no means clear what the CFTC would have decided, but if the CFTC had concluded that the CDS had no social utility, or if the CFTC had concluded that the CDS had some social utility but that that utility was outweighed by the added complexity that CDSs brought to the financial system, then CDSs would have been banned. The damage they inflicted during the Financial Crisis would thus have been avoided. Alternatively, if the CFTC concluded that CDSs had sufficient social utility that a ban should not be put in place, the precautionary philosophy would have counseled the CFTC to err on the side of protecting systemic stability by imposing at least some regulation on CDSs (perhaps by mandating insurable interest, margin, disclosure or clearing requirements). These types of regulations would have mitigated the multiplication and obfuscation of risk occasioned by CDSs in the lead-up to the Financial Crisis, and the Crisis would have been less severe.

Going forward, if we fail to embrace a precautionary approach and instead adopt legislative proposals that require the benefits of regulating financial innovation to demonstrably outweigh the costs of such regulation (or allow the courts to impose such requirements), then the financial innovation process will essentially remain unregulated, leaving the financial system unprotected against whatever is the next CDS.

5. CONCLUSION

This Article has established that financial stability regulation should be formulated from a precautionary perspective: a precautionary approach, rather than strict cost-benefit analysis, is necessary to address the complexities inherent in the financial system, the interests of dispersed stakeholders in financial stability, and the tendency of both regulators and the financial industry to ignore the frequency and gravity of financial crises. By shifting the burden to financial industry participants to demonstrate that their activities should not be regulated, strains on financial regulatory agency resources will be reduced, and those agencies will be less susceptible to capture by the financial industry. There will, of course, be practical challenges inherent in operationalizing a precautionary approach to regulation of activities that affect financial stability. The proposals made by Posner & Weyl and Omarova with regard to *ex ante* regulation of financial

[258] Posner & Weyl, *supra* Note 153, at 22.
[259] Richard Portes, *supra* Note 250.

innovation are a good start, however, much more work is needed. The intention of this Article, then, is to spark a debate about the philosophy underlying financial stability regulation, so that public support for a move towards consistently precautionary financial stability regulation can be amassed, and academics and policymakers can devote time and thought to the operationalization of a precautionary approach to other financial activities.