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August 6, 2012

# A New Philosophy For Financial Stability Regulation

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## A New Philosophy For Financial Stability Regulation

Hilary J. Allen<sup>1</sup>

*The financial crisis of 2007-2008 showed up many inadequacies in the pre-crisis approach to financial stability regulation. The response from legislators and regulators has been to implement a broad new range of regulatory tools – individual solutions to individual regulatory failings highlighted by the crisis. But the prevailing cost-benefit philosophy that informed financial stability regulation in the United States prior to the crisis persists today - there has been no real effort to rethink the overarching philosophy behind financial stability regulation. Because a cost-benefit approach gives too much primacy to the short-term interests of the financial industry, this Article rejects cost-benefit analysis and develops a substitute precautionary philosophy for financial stability regulation, drawing analogies from the literature on the use of the precautionary principle in regulating complex environmental systems. A precautionary philosophy 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 interests of the financial sector.*

*While this Article is primarily intended to advocate a change in the philosophy that underpins financial stability regulation (and thus provide a cogent theoretical framework for regulators implementing Dodd-Frank and future reforms), this Article also explores a more practical framework for precautionary review of innovative financial products. This operates as a concrete illustration of how the precautionary philosophy 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

Systemic financial crises have far-reaching and irreversible effects for society, in the form of recession, low employment and poverty. As the world continues to suffer the severe consequences of the crisis of 2007-2008,<sup>2</sup> the avoidance of systemic crises and the promotion of stability have become a key focus of financial regulation.<sup>3</sup> In both academic and policy circles, there is a recognition that the microprudential approach to financial stability regulation that prevailed prior to the Financial Crisis was inadequate, because it focused only on the stability of individual banks and neglected the possibility that a bank failure could have spillover effects that might imperil the entire financial system.<sup>4</sup> It is now acknowledged that if regulation is to have any hope of avoiding or mitigating crises, it must look more broadly at the interactions of actors and products within the financial system in order to better detect threats to stability.

While policy makers and academics have generally recognized the need for financial stability regulation to embrace new regulatory tools to address systemic risk (such as increased capital requirements for systemically risky institutions, and countercyclical capital buffers),<sup>5</sup> to date

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<sup>2</sup> This crisis will be referred to in this Article as the “Financial Crisis”.

<sup>3</sup> For example, in 2010, the United States enacted the Dodd-Frank Wall Street Reform and Consumer Protection Act Pub. L. No. 111-203, 124 Stat. 1376 (2010) (hereinafter, “Dodd-Frank”), which is expressed to be an Act to “To promote the financial stability of the United States”.

<sup>4</sup> See, for example, the work cited in Samuel G. Hanson et al., *A Macroprudential Approach to Financial Regulation*, 25 J. ECON. PERSP. 3, 3 (2011).

<sup>5</sup> The Basel Committee on Banking Supervision (“BCBS”) has set international standards for these measures (BCBS, *Measures for global systemically important banks agreed by the Group of Governors and Heads of Supervision* (June 25, 2011); BCBS, *Basel III: A global*

no one has truly recognized or articulated the shift in regulatory philosophy that must inform the use of such tools. Financial stability regulation requires a recognition 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. It requires a recognition 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, financial stability regulation needs to be informed by a conscious acknowledgment 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 philosophy 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 developed a philosophy 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.<sup>6</sup> It must be noted, though, that the precautionary principle does not have universal support in the environmental arena: there is something of a split between the proponents of the precautionary principle, and those who favor regulating only when the benefits of regulating demonstrably outweigh the costs of doing so<sup>7</sup> (this latter approach is known as cost-benefit analysis).<sup>8</sup>

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*regulatory framework for more resilient banks and banking systems* (December 16, 2010). By way of example of implementation at the national level, Section 115 of Dodd-Frank directs the Financial Stability Oversight Council to consider implementing more stringent risk-based capital requirements for systemically important financial institutions. For a more general discussion of the macroprudential tools available to regulators, see Hanson et al., *supra* Note 4, at 5.

<sup>6</sup> 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).

<sup>7</sup> 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.” The United States has 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, “Beyond Precautionary”).

<sup>8</sup> That is not to say that there is only one approach to cost-benefit analysis – cost-benefit analysis can encompass a spectrum of methodologies, ranging from a more rigid cost-

A form of cost-benefit analysis currently informs the work of financial regulators in the United States,<sup>9</sup> and any attempt to move to a precautionary approach to financial stability regulation is likely to provoke criticisms that are similar to those evinced in the environmental literature by cost-benefit analysis proponents.<sup>10</sup> However, as discussed in Section 2, strict cost-benefit analysis is problematic because it focuses regulatory attention on readily observable financial industry compliance costs, and discourages implementation of regulation if those costs are not outweighed by quantifiable and demonstrable benefits. Because of the difficulties inherent in *proving* the efficacy of financial stability regulation, a cost-benefit approach to this type of regulation therefore tends towards short-sighted deregulatory behavior. While the enactment of Dodd-Frank evinces a less deregulatory and more precautionary intent of Congress,<sup>11</sup> there has been no active rethinking of the philosophy that should inform the work of the regulatory agencies charged with implementing Dodd-Frank. As such, the agencies continue to approach regulation from more of a cost-benefit perspective, and there is potential for the precautionary intent embodied in the statutory provisions of Dodd-Frank to be eviscerated through agency implementation.<sup>12</sup>

A consideration of the need for financial regulators to embrace a precautionary philosophy is particularly à propos at the moment, given that strict cost-benefit analysis requirements are increasingly being used as a sword by those who favor a deregulatory approach. The D.C. Circuit recently decided in favor of the Business Roundtable and the Chamber of Commerce of the United States of America when they challenged a proxy

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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 benefits of regulation *demonstrably* outweigh the costs.

<sup>9</sup> See Note 37 and accompanying text.

<sup>10</sup> See text accompanying Notes 88-104.

<sup>11</sup> The purpose of Dodd-Frank as a whole is precautionary: it is expressed to be an Act “to promote the financial stability of the United States”. Specific provisions seek to achieve that goal by, for example, limiting banks’ reliance on leverage (see Section 171), involvement in proprietary trading (see Section 619, colloquially referred to as the “Volcker Rule”) and use of derivatives (see Section 716), because of concerns that such activities that have the potential to imperil banks’ stability.

<sup>12</sup> 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, *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/>)

access rule promulgated by the Securities and Exchange Commission (“SEC”). The Court found that the SEC “neglected both to quantify the costs companies would incur opposing shareholder nominees and to substantiate the rule's predicted benefits” and “relied upon insufficient empirical data.”<sup>13</sup> The Business Roundtable decision was the latest in a string of D.C. Circuit decisions striking down SEC rules as arbitrary and capricious because of their failure “adequately to assess the economic effects of a new rule”<sup>14</sup> – the regulations that flesh out the Volcker Rule<sup>15</sup> are likely to face similar challenges from proponents of deregulation.<sup>16</sup> If Congress were to enact legislation that expressly directed financial regulatory agencies to act in a precautionary manner, such challenges could not succeed.

As Section 3 will explore further, abandoning strict cost-benefit analysis in favor of a precautionary approach to financial stability is thus a partial antidote to 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 also have ancillary benefits. The precautionary approach advocated in this Article would shift the “regulatory burden of proof” so that regulated entities are required to demonstrate *ex ante* 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

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<sup>13</sup> Business Roundtable v. S.E.C., 647 F.3d. 1144 (D.C. Cir. 2011).

<sup>14</sup> Business Roundtable v. S.E.C., 647 F.3d. 1144 (D.C. Cir. 2011). The rule was struck down notwithstanding that Section 971 of Dodd-Frank specifically authorizes the SEC to make a proxy access rule.

<sup>15</sup> The “Volcker Rule” is the colloquial name for Dodd-Frank Section 619. Broadly speaking, 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 outside 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/>)

<sup>16</sup> 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>). Financial industry members have even preemptively threatened agencies with challenges prior to the finalization of the rule, in an attempt to influence how the rule is drafted. For example, in the commodity regulations space, “[s]ome industry lobbyists note that Dodd-Frank leaves it to regulators to enforce position limits only “as appropriate.” The groups pushed regulators to interpret the fine print to mean that in essence, no limits were appropriate. Other groups even issued thinly veiled threats of legal action. In March, the Futures Industry Association urged the commission to scrap its position limits plan, saying it “may be legally infirm.”” Ben Protess, *Commodity Panel Moves in to Stop Speculative Trading*, N.Y. TIMES, October 18, 2011 (available at <http://dealbook.nytimes.com/2011/10/18/regulators-move-to-rein-in-speculative-trading/?ref=business>).

capture of financial regulators by their regulated industry.<sup>17</sup> 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 a precautionary philosophy – the majority of the article speaks in only the most general terms about how the philosophy should inform the regulation of financial activities. However, to ground this philosophy in a more concrete context, Sections 4 and 5 will focus on the hot-button issue of financial innovation as a testing ground for a precautionary approach to financial regulation.<sup>18</sup> Some prominent examples 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 failed to implement such regulation. Their failure to do so can be attributed to a number of causes, including a presumption that innovation is inherently beneficial, too much deference to the financial industry with regard to how financial innovations should be regulated, and fixation on short-term benefits to the neglect of long-term consequences (especially low-probability but potentially disastrous long-term consequences). A precautionary approach to regulating financial innovation will help address all of these shortcomings, and promote regulation of financial innovation that is better calculated for ensuring systemic stability.

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<sup>17</sup> See text accompanying Notes 119-139.

<sup>18</sup> 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, Litan has identified the following as some of the key financial instrument innovations of the last three decades: 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. The term “financial innovation” can also encompass the evolution of new types of financial intermediaries (Litan has identified hedge funds and private equity funds, amongst others, as important new intermediaries that have evolved over the last three decades). See Robert E. Litan, *In Defense of Much, But Not All, Financial Innovation*, Brookings Institution Research Paper, February 17, 2010 (available at <http://www.brookings.edu/research/papers/2010/02/17-financial-innovation-litan>), pages 16-43. This Article, however, will focus on the innovation of new *instruments*: this focus by no means discounts the 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>).

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?”<sup>19</sup>*

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.<sup>20</sup> However, as this Article will explore, Reddy’s precautionary view is a necessary ingredient of effective financial stability regulation, and has much to recommend it.

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<sup>19</sup> 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 <http://www.imf.org/external/mmedia/view.aspx?vid=817505940001>. Dr Reddy made this statement approximately 35 minutes into the discussion).

<sup>20</sup> 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 18 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) and 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”).

## 2. THE EXTANT PHILOSOPHY OF FINANCIAL STABILITY REGULATION

### A. *The Purpose Of, and Need For, Financial Stability Regulation*

The primary social 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.<sup>21</sup> 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.<sup>22</sup> Because the financial system is the primary provider of credit and other capital intermediation,<sup>23</sup> a crisis that affects financial system stability impacts the access of the broader economy to credit and in turn, economic growth.<sup>24</sup> In addition to facilitating capital formation, a relatively stable financial system is also a precondition to a properly functioning economy in that it allows for the spreading of risk, the elucidation and dissemination of information about companies, and a system for payments.<sup>25</sup> The current precarious economic climate<sup>26</sup> is an uncomfortably salient illustration of

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<sup>21</sup> “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, See* Litan, *supra* Note 18 at 2; Manuel A. Utset, *Complex Financial Institutions and Systemic Risk*, 45 GA. L. REV. 779, 787 (2010-2011).

<sup>22</sup> 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).

<sup>23</sup> 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](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](http://www.newyorker.com/reporting/2010/11/29/101129fa_fact_cassidy?currentPage=all)).

<sup>24</sup> 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 22 at xlv.

<sup>25</sup> Merton, *supra* Note 21 at 24. *See* Litan, *supra* Note 18 at 2; Utset, *supra* Note 21 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](http://www.fsa.gov.uk/pubs/speeches/at_17mar10.pdf)) pages 2-3.

<sup>26</sup> “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

what happens to the growth of the real economy when the stability of the financial system is compromised by a financial crisis.<sup>27</sup>

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.<sup>28</sup> Individual financial institutions, however, 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<sup>29</sup> (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).<sup>30</sup> Not only do financial institutions lack incentives to reduce systemic risk, they also lack the information and tools to do so – evaluation of systemic risk requires a broad oversight of all financial institutions, and systemic risk reduction requires coordination

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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 (September 23, 2011), page 5.

<sup>27</sup> 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 22 at 10.

<sup>28</sup> The United States Congress has decreed that financial stability is an important goal of regulatory policy, albeit without defining what financial stability actually is. 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”. Typically, the term is defined by its inverse, i.e. the absence of financial instability or crisis. See, for example, Michael Foot, Managing Director of the Financial Services Authority, *What is Financial Stability and How Do We Get It?*, ACI (UK) The Roy Bridge Memorial Lecture (April 3, 2003) (available at <http://www.fsa.gov.uk/Pages/Library/Communication/Speeches/2003/sp122.shtml>); Charles Goodhart, Per Jacobsson Lecture, Zurich, Switzerland (June 27, 2004) (available at <http://www.bis.org/events/agm2004/sp040627.htm>). Former Fed Governor Susan Schmidt Bies noted that “financial stability implies that key institutions in the financial system are operating without significant difficulty and markets are generally functioning well.” Susan Schmidt Bies, Governor of the Federal Reserve Board, Remarks At the Central Bank of the Republic of Turkey’s International Conference on Financial Stability and Implications of Basel II, Istanbul, Turkey (May 17, 2005) (available at <http://www.federalreserve.gov/boarddocs/speeches/2005/20050517/default.htm>).

<sup>29</sup> Henry T.C. Hu, *Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism*, 102 YALE L.J. 1457, 1502 (1992-1993).

<sup>30</sup> 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 20 at 206 (2008-2009).

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 systemic risk has fallen to the financial regulators.<sup>31</sup> The goal of these regulators is to avoid financial crises, so as to achieve the stable (but not static) financial system that is a precondition to economic growth.

*B. The Inadequacies of a Cost-Benefit Analysis Approach to Financial Stability Regulation*

Prior to the Financial Crisis, the approach to financial stability regulation in the United States (and internationally) was best described as “microprudential” – it “focus[ed] on the financial conditions of individual institutions in isolation,”<sup>32</sup> generally assuming that if individual institutions behaved in a safe and sound manner, the financial system as a whole would be similarly safe and sound. After the Financial Crisis, many criticized the microprudential approach for failing to properly account for systemic risk and for the social costs of systemic failure:<sup>33</sup> as a response there has been a concerted effort to move towards using macroprudential tools in financial

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<sup>31</sup> “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 (April, 2011), page 43. 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 supervision and 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 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 Dodd-Frank Section 619, colloquially known as the Volcker Rule. For further discussion of the Volcker Rule, see Note 15). Following the enactment of Dodd-Frank, the broadest systemic risk oversight function lies with the Financial Stability Oversight Council (“FSOC”), a body comprised of representatives of all of the various financial regulatory agencies. The FSOC is charged with “identify[ing] risks to the financial stability of the United States that could arise from the material financial distress or failure, or ongoing activities, of large, interconnected bank holding companies or nonbank financial companies, or that could arise outside the financial services marketplace” and “respond[ing] to emerging threats to the stability of the United States financial system.” Dodd-Frank Section 112.

<sup>32</sup> Ben S. Bernanke, Chairman, Fed. Res. Sys., Reducing Systemic Risk, Speech at the Federal Reserve Bank of Kansas City's Annual Economic Symposium, Jackson Hole, Wyoming (August 22, 2008) (available at <http://www.federalreserve.gov/newsevents/speech/bernanke20080822a.htm>)

<sup>33</sup> Hanson et al., *supra* Note 4, at 3.

regulation,<sup>34</sup> which target the complex interactions of institutions and products within the financial system.<sup>35</sup> However, there has been little consideration of the need to also update agencies' regulatory *philosophy* in light of the now-acknowledged complexities, interconnections and uncertainties inherent in our financial system, and the grave social consequences of financial crises. Instead, the pre-Financial Crisis cost-benefit philosophy of financial regulation continues to prevail in financial regulatory agencies. Post-Financial Crisis, there needs to be an explicit reconsideration of whether a cost-benefit analysis regulatory philosophy is an appropriate companion to financial stability regulation. This issue is particularly ripe for consideration at the moment: although financial agencies tend to approach regulation from an empirical cost-benefit perspective,<sup>36</sup> there is not currently any legislative requirement that they do so.<sup>37</sup> However, there are legislative efforts afoot to entrench a much stricter,

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<sup>34</sup> Ben S. Bernanke, Chairman, Fed. Res. Sys., Implementing a Macroprudential Approach to Supervision and Regulation, Speech at the 47th Annual Conference on Bank Structure and Competition, Chicago, Illinois (May 5, 2011) (available at <http://www.federalreserve.gov/newsevents/speech/bernanke20110505a.htm>)

<sup>35</sup> Many of the new regulatory initiatives that have been introduced since the Financial Crisis are macroprudential in orientation. At an international level, the most prominent macroprudential reform has been the provision for countercyclical capital accumulation included in Basel III – see Hanson et al., *supra* Note 4, at 7-9; Douglas J. Elliott, *Choosing Among Macroprudential Tools*, Brookings Institution Research Paper, June 7, 2011 (available at [http://www.brookings.edu/~media/research/files/papers/2011/6/07%20macroprudential%20tools%20elliott/0607\\_macroprudential\\_tools\\_elliott.pdf](http://www.brookings.edu/~media/research/files/papers/2011/6/07%20macroprudential%20tools%20elliott/0607_macroprudential_tools_elliott.pdf)) pages 5-6. In the United States, the Board of Governors of the Federal Reserve Bank has been directed to “seek to make [capital] requirements countercyclical, so that the amount of capital required to be maintained by a company increases in times of economic expansion and decreases in times of economic contraction, consistent with the safety and soundness of the company.” Dodd-Frank Section 616.

<sup>36</sup> 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](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. This tendency is likely to increase, given that the D.C. Circuit has evidenced an increasing willingness to set aside financial regulatory rules pursuant to the Administrative Procedure Act (5 U.S.C. § 706(2)(A)), on the grounds that rules that are not supported by sufficient empirical cost-benefit analysis are arbitrary and capricious. See *Business Roundtable v. S.E.C.*, 647 F.3d 1144, 1148-49 (D.C. Cir. 2011).

<sup>37</sup> Many non-financial regulatory agencies are subject to the stringent CBA 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

empirical cost-benefit approach to financial regulation in the United States.<sup>38</sup> These legislative efforts should be resisted: our approach to financial stability regulation should be moving in the opposite direction.

Post-Financial Crisis, financial stability regulation needs to be approached in a way that is cognizant of and responsive to the magnitude of the social consequences of financial crises, and to the inherent complexities of the financial system. Turning first to the social consequences of financial crises, it is important to note that these go beyond the immediate dollar costs of crises (such as government bail-outs). It is the second-degree social costs that flow from such crises that are the most devastating.<sup>39</sup> For example, financial crises are destructive of confidence in the financial system, which is a prerequisite for the provision of credit and a properly functioning economy.<sup>40</sup> Government debt tends to explode in the wake of a financial crisis,<sup>41</sup> which can create political pressure to institute austerity measures with resulting broad social hardship.<sup>42</sup> Furthermore, the aftermath of

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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, 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).

<sup>38</sup> 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). The bill would require rigorous cost-benefit analysis of any regulation proposed by a United States financial regulatory agency, and proposes that no regulatory action be permitted if the *quantified* benefits do not outweigh the quantitative costs of that action (unless Congress grants a waiver). S. 1615, Sections 3(a)(4); 3(a)(5); 3(b)(4)(A).

<sup>39</sup> Jackson, *supra* Note 30 at 288.

<sup>40</sup> 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.

<sup>41</sup> 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 22 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>).

<sup>42</sup> 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](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

financial crises is usually characterized by significant declines in employment.<sup>43</sup> Stephen 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.*<sup>44</sup>

It is very difficult to put a dollar value on the benefit of avoiding these social costs, and so a strict cost-benefit approach to financial regulation does not fully recognize such benefit: instead, it trains the focus of the regulators on what can be readily observed, replicated and quantified.<sup>45</sup> Even if economists could agree on dollar values that represented the assumed value of avoiding or mitigating a financial crisis,<sup>46</sup> cost-benefit analysis would still deprioritize the benefits of avoiding or mitigating crises, because it is difficult to prove that financial stability regulation will *succeed* in so avoiding or mitigating crises.<sup>47</sup> Much of the

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[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](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)

<sup>43</sup> “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 22 at 224.

<sup>44</sup> Schwarcz, Systemic Risk, *supra* Note 20 at 207.

<sup>45</sup> “[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 40 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 6 at 1319; 1338.

<sup>46</sup> 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.”

<sup>47</sup> “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.” Raghuram G. Rajan, *Has Financial Development Made the World Riskier?*, FEDERAL RESERVE BANK OF KANSAS CIY SYMPOSIUM: THE

difficulty in showing the efficacy of financial stability regulation stems from the complexity of the financial system. 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),<sup>48</sup> the level of interconnection between those actors, and the unpredictable (sometimes even irrational) behavior of those interconnected actors.<sup>49</sup> 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.<sup>50</sup> Accordingly, complexity in the financial system is 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.<sup>51</sup> In such a complex system that defies predictability,<sup>52</sup> it is difficult for regulators to demonstrate the likely success (the “benefit”) of their financial stability regulations.<sup>53</sup>

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GREENSPAN ERA: LESSONS FOR THE FUTURE, 313, 350 (2005). 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 20 at 221-222.

<sup>48</sup> Utset, *supra* Note 21 at 799.

<sup>49</sup> “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.

<sup>50</sup> 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 investors and other market participants to anticipate and avoid these failures.” Schwarcz, *Regulating Complexity*, *supra* Note 20 at 214.

<sup>51</sup> 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 20 at 238; Hu, *supra* Note 29, at 1500.

<sup>52</sup> Such complexities “obscure the ability of market participants to see and judge consequences” Schwarcz, *Regulating Complexity*, *supra* Note 20 at 220; 233.

<sup>53</sup> “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 one element of the cost-benefit equation that is relatively certain and readily susceptible to empirical analysis is the private compliance cost associated with financial stability regulation. If compliance costs are given primacy because of their susceptibility to empirical analysis, then that is likely to exacerbate some of the existing cognitive biases (otherwise known as heuristics) that cause regulators to focus on short-term costs to the financial industry, and distract their attention from the long-term, systemic consequences of the actions of financial institutions.<sup>54</sup> When regulatory attention is focused on the short-term costs of regulation to the regulated industry, then that favors the absence of regulation:<sup>55</sup> a cost-benefit analysis approach to financial stability regulation is therefore likely to operate as a deregulatory philosophy.<sup>56</sup> Financial stability can only be addressed by regulation,<sup>57</sup> however, and the consequences of financial instability are potentially catastrophic.<sup>58</sup> As such, we need to move away from cost-benefit analysis as the underlying philosophy of financial stability regulation. As Guido Calabresi noted in 1968:

*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 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 than some action . . . in uncertainty, increase the chances of correcting an error.*<sup>59</sup>

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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 30 at 260.

<sup>54</sup> For further discussion of heuristics, see the text accompanying Notes 91-104.

<sup>55</sup> “[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 40 at 37.

<sup>56</sup> In the wake of the Financial Crisis, there is a general consensus that the previous thirty years of deregulation created the conditions that made the Financial Crisis so severe. “More than 30 years of deregulation and reliance on self-regulation by financial institutions, championed by former Federal Reserve Chairman Alan Greenspan and others, supported by successive administrations and Congresses, and actively pushed by the powerful financial industry at every turn, had stripped away key safeguards, which could have helped avoid catastrophe.” FINANCIAL CRISIS INQUIRY COMMISSION, THE FINANCIAL CRISIS INQUIRY REPORT, xviii (2011) (hereinafter, the “FCIC Report”).

<sup>57</sup> See text accompanying Notes 29-31.

<sup>58</sup> See text accompanying Notes 39-44.

<sup>59</sup> Guido Calabresi, *Transaction Costs, Resource Allocation, and Liability Rules – A Comment*, 11 J.L. & ECON. 67, 70 (1968).

### 3. A PRECAUTIONARY PHILOSOPHY FOR FINANCIAL STABILITY REGULATION

The precautionary principle has primarily been used and discussed as a basis for environmental regulation, and to date, there has been very little discussion of the principle as the basis for financial regulation.<sup>60</sup> However, in many respects, the complex interconnected network of actors and products in the financial system bears striking similarities to the natural environment, and financial and environmental systems share the potential for low-probability but catastrophic failures:<sup>61</sup> because of these similarities, the scholarship related to the environment provides some useful insights that can be applied in developing a new philosophy for financial stability regulation. This Section explores the similarities between the financial system and the environment, and extrapolates some of the insights of environmental scholarship to formulate a precautionary philosophy that should inform financial stability regulation.

#### *A. The Task of the Regulator in 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 systems like 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.<sup>62</sup> These systems “give rise to stunningly complex and difficult to predict interactions”,<sup>63</sup> and as a result, regulators trying to regulate these systems are to some extent working in the realm of Knightian uncertainty.<sup>64</sup> Complexity and

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<sup>60</sup> 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 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>).

<sup>61</sup> 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).

<sup>62</sup> “[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 6 at 215.

<sup>63</sup> *Id.* at 215.

<sup>64</sup> 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

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."<sup>65</sup> 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-impact crisis circumstances (known as "fat-tail" events),<sup>66</sup> when rational assumptions about the operation of complex systems and the interactions of system components are less likely to hold.

In these circumstances, regulators are often unable to demonstrate the "benefit" side of the regulatory equation to the levels of proof required by cost-benefit analysis.<sup>67</sup> However, despite this uncertainty, regulators must still try to regulate because private actors operating within such systems have little incentive to internalize the negative consequences of the risks they take, and absent regulation, the consequences of such risks will be borne by society at large.<sup>68</sup> Proponents of the precautionary principle take the view that in the face of such uncertainty, regulators should be permitted to make value judgments about the propriety of regulatory action,<sup>69</sup> and the irreversibility of the potential consequences of an environmental disaster militates for those values to be of a precautionary bent – better safe than sorry.

Financial stability regulation faces similar challenges – the immediate costs of taking regulatory action are usually readily apparent,

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"unknown unknowns" rather than "known unknowns." See FRANK H. KNIGHT, *RISK, UNCERTAINTY AND PROFIT* 19-20 (1921).

<sup>65</sup> Dana, *supra* Note 6 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 6 at 211.

<sup>66</sup> "[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 6 at 216.

<sup>67</sup> 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).

<sup>68</sup> Regarding externalities in the environmental sphere, Dana notes that: "the bearers of many environmental and health risk are the general public." Dana, *supra* Note 6 at 1332. For a discussion of financial institutions externalizing the systemic consequences of their activities, see the text accompanying Notes 29-30.

<sup>69</sup> Kysar, *supra* Note 6 at 235.

whereas it is hard to estimate the benefits of avoiding a future systemic crisis, because: (1) it is difficult to determine how likely a financial crisis is to occur and virtually impossible to predict its depth and potential social harm,<sup>70</sup> and (2) it is difficult to assess whether regulations aimed at preserving systemic stability will in fact avoid or mitigate financial crises.<sup>71</sup> Despite these difficulties, regulators should persevere, because the social consequences of future crises will be irreversible<sup>72</sup> and potentially catastrophic.<sup>73</sup>

Of course, there is a limit to the parallels that can be drawn between environmental and financial stability regulation.<sup>74</sup> Environmental regulation does lay a stronger claim to a precautionary approach, because it aims to protect health, life and safety. While failure of the financial system has widespread detrimental effects, its immediate effect on life, health and safety is not as pronounced. The consequences of financial collapse are

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<sup>70</sup> Rajan, *supra* Note 47 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 18, at 23-25). 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>)

<sup>71</sup> 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 47 at 350.

<sup>72</sup> 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. 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/>). For further discussion of the application of the precautionary principle to theoretically reversible risks, see Dana, *supra* Note 6 at 1316.

<sup>73</sup> See text accompanying Notes 39-44.

<sup>74</sup> For example, 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 20 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.

more likely to be widespread and increased unemployment, poverty and crime:<sup>75</sup> while these are dire outcomes, they are not as dire as death and disease (although increases in poverty and crime may indirectly cause death and disease). Nonetheless, the magnitude of the harm caused by financial crises is still sufficient to justify employing a precautionary philosophy, especially if the public cost of regulation (in terms of the foregone benefits of regulated financial activities for society as a whole) is not overly high.<sup>76</sup>

### *B. Formulation of a Precautionary Philosophy to Inform Financial Stability Regulation*

In formulating a precautionary philosophy 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 Cass Sunstein. Sunstein identifies different “strengths” of the precautionary principle, which are all contrasted with the cost-benefit analysis approach to regulation. 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.”<sup>77</sup> 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.<sup>78</sup> 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.<sup>79</sup> The strongest 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.<sup>80</sup> This Article advocates the stronger,<sup>81</sup> but not the strongest, form of the precautionary principle: the uncertainties in the financial system are inherent and no financial activity can

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<sup>75</sup> Schwarcz, Systemic Risk, *supra* Note 20 at 207.

<sup>76</sup> By way of illustration, Section 4(a) of this Article will consider what benefits would be foregone if a precautionary approach to regulating financial innovation were adopted.

<sup>77</sup> Sunstein, Beyond Precautionary, *supra* Note 7 at 1012.

<sup>78</sup> See text accompanying Notes 48-53.

<sup>79</sup> Cass R. Sunstein, *Irreversible and Catastrophic: Global Warming, Terrorism, and Other Problems*, 23 PACE ENVTL. L. REV. 3, 6 (2005-2006) (hereinafter “Irreversible and Catastrophic”); Dana, *supra* Note 6 at 1315.

<sup>80</sup> Sunstein, Irreversible and Catastrophic, *supra* Note 79 at 6; Kysar, *supra* Note 6 at 243; Sunstein, Beyond Precautionary, *supra* Note 7 at 1013.

<sup>81</sup> Sections 3(c) and 3(d) of this Article explores in detail the appeal of the stronger form of the precautionary principle in the context of systemic risk regulation.

conclusively be proved safe, so using the strongest form of the precautionary principle would put regulators in a quandary.<sup>82</sup>

Importantly, use of the stronger-form precautionary principle as the underlying philosophy for financial stability regulation does not mean that regulators should ignore the costs imposed by such regulation.<sup>83</sup> 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 once “the burden of proof [has been shifted] to proponents of regulatory inaction.”<sup>84</sup> Rather than adhering to a strict monetization of costs and benefits, a precautionary approach would accept that maintaining a stable financial system is a benefit to society of great magnitude<sup>85</sup> and that the fiscal and monetary remedies available after a crisis are costly,<sup>86</sup> 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).<sup>87</sup>

### C. Evaluating the Precautionary Philosophy

A variety of criticisms have been leveled at the precautionary principle in the environmental literature. One prevalent criticism is that the precautionary principle is too incoherent and indeterminate to inform any regulatory exercise, whereas cost-benefit analysis provides clarity.<sup>88</sup> While it is true that the precautionary principle is not a formula for precise answers, the complexity of environmental systems (and the financial

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<sup>82</sup> 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.

<sup>83</sup> Kysar, *supra* Note 6 at 204; Dana, *supra* Note 6 at 1316.

<sup>84</sup> Dana, *supra* Note 6 at 1315.

<sup>85</sup> 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 20 at 235.

<sup>86</sup> 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 47 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 41 and 42 and accompanying text.

<sup>87</sup> Kysar, *supra* Note 6 at 231.

<sup>88</sup> See, for example, Christopher D. Stone, *Is There a Precautionary Principle?*, 31 ENVTL. L. REP. 10790, 10799 (2001); Todd J. Zywicki, *Baptists? The Political Economy of Environmental Interest Groups*, 53 CASE W. RES. L. REV. 315, 333 (2002).

system) 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.<sup>89</sup>

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.<sup>90</sup> 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 how a precautionary philosophy interacts with cognitive biases.<sup>91</sup> One important 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 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.””<sup>92</sup> 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.<sup>93</sup> The concern is that the precautionary principle thus acts as a

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<sup>89</sup> 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 6 at 231.

<sup>90</sup> Sunstein, *Beyond Precautionary*, *supra* Note 7 at 1004; 1008.

<sup>91</sup> “[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 6 at 1332.

<sup>92</sup> Cass R. Sunstein, *Behavioral Analysis of Law*, 64. U. CHI. L. REV. 1175, 1188 (1997).

<sup>93</sup> Sunstein, *Beyond Precautionary*, *supra* Note 7 at 1041.

vehicle for entrenching society's irrational fears,<sup>94</sup> and diverts regulators' attention from the systemic effects of their intervention.<sup>95</sup> However, this criticism fails to recognize that the most salient harms associated with regulation are often compliance costs, both because of their immediacy<sup>96</sup> and because of a natural bias towards optimism (people tend to assume, even without a rational basis, that they will be able to avoid future risks).<sup>97</sup> 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."<sup>98</sup> Some have argued that because of loss aversion, a precautionary approach tends to neglect the benefits of a regulated activity.<sup>99</sup> 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.<sup>100</sup> In the latter conception, the more immediate losses (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

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<sup>94</sup> Frank Furedi, *Precautionary Culture and the Risk of Possibilistic Risk Assessment*, 2 ERASMUS L. REV. 197, 210 (2009)

<sup>95</sup> Sunstein, *Beyond Precautionary*, *supra* Note 7 at 1049.

<sup>96</sup> Dana, *supra* Note 6 at 1322.

<sup>97</sup> *Id.* at 1325.

<sup>98</sup> Sunstein, *Beyond Precautionary*, *supra* Note 7 at 1008.

<sup>99</sup> *Id.* at 1009.

<sup>100</sup> Dana argues that framing such decisions as a contest between two sets 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 6 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.

future losses,<sup>101</sup> and 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.<sup>102</sup> 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.<sup>103</sup> 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.”<sup>104</sup>

While a precautionary philosophy would thus realign cognitive biases in a way that favors broader, systemic oversight of the financial system, there will still be regulatory errors made. Indeed, regulatory mistakes are inevitable, given the complexity of the financial system.<sup>105</sup> Furthermore, there are some problems that are inherent in all financial stability regulation, whether informed by a precautionary philosophy or not. For example, regulations can themselves be destabilizing in that they tend to encourage uniformity and thus heighten procyclicality and correlation of risks.<sup>106</sup> To the extent that regulations are incrementally layered upon financial activities (and other financial regulations) as problems become evident, this adds further destabilizing complexity to the financial system<sup>107</sup>

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<sup>101</sup> Dana, *supra* Note 6 at 1324-1326.

<sup>102</sup> Sunstein refers to this as “probability neglect.” Sunstein, *Beyond Precautionary*, *supra* Note 7 at 1010.

<sup>103</sup> “Individuals tend to ignore low probability catastrophic events.” Hu, *supra* Note 29, at 1488. See also Daniel Kahneman & Amos Tversky, “people overweigh outcomes that are considered certain [such as the costs of regulation], relative to outcomes which are merely probable”, as cited in Dana, *supra* Note 6 at 1321. 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.” Nicola Gennaioli, Andrei Shleifer and Robert Vishny, *Financial Innovation and Financial Fragility*, FONDAZIONE ENI ENRICO MATTEI NOTA DI LAVORO 114.2010, 14 (May, 2010).

<sup>104</sup> Dana, *supra* Note 6 at 1330.

<sup>105</sup> 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. Brett McDonnell & Daniel Schwarcz, *Regulatory Contrarians*, 89 N.C. L. REV. 1629, 1641 (2011).

<sup>106</sup> For a detailed discussion of this issue, see Charles K. Whitehead, *Destructive Coordination*, 96 Cornell L. Rev. 323 (2011).

<sup>107</sup> “[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

as well as creating incentives for regulatory arbitrage.<sup>108</sup> Finally, every regulation that limits a financial activity will also limit the socially beneficial aspects of that activity – for example, restricting the use of a new risk-management product may hamper financial institutions’ ability to manage their risk profile.<sup>109</sup> However, these flaws are inherent in any financial stability regulation – the only way to truly avoid them is to abandon such regulation altogether. But this is not a realistic option, given the social costs of financial crises, and given that absent regulation, financial institutions have little incentive to structure their risk profiles so as to maintain stability.<sup>110</sup> Recognizing that stability regulation is a necessity, a precautionary approach to such regulation 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, rather than narrowly focusing on only the most likely or expected outcomes.<sup>111</sup> Furthermore, as the next Section explores in more detail, the implementation of a precautionary philosophy will have many ancillary benefits that will improve financial stability regulation.

#### *D. Ancillary Benefits of Implementing a Precautionary Philosophy*

The precautionary principle, rather than cost-benefit analysis, is better suited to overcoming cognitive biases that favor immediate loss avoidance,<sup>112</sup> and causing financial regulators to adopt the long-term and wide-view approach so necessary to the regulation of an ever-evolving

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(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).

<sup>108</sup> 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 markets.” 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).

<sup>109</sup> For a discussion of the social utility of new risk-management products, see Section 4a *infra*.

<sup>110</sup> See Notes 28-31 and accompanying text. See also Whitehead, *supra* Note 106 at 358.

<sup>111</sup> 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 106 at 329-330.

<sup>112</sup> 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.” McDonnell & Schwarcz, *supra* Note 105 at 1639.

financial system.<sup>113</sup> To implement this new precautionary philosophy, enabling statutes should expressly direct regulators to devise and enforce regulation in a precautionary way, prioritizing society's interests in avoiding financial crises.<sup>114</sup> 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.<sup>115</sup> However, to ensure that precautionary concerns are not ignored at the agency level or by the courts, financial stability legislation should expressly direct regulators to approach their activities from a precautionary, rather than a cost-benefit, perspective. Furthermore, regulators should face the prospect of having to provide Congress or others with a description of their approach to systemic risk regulation, and how that process took into account considerations of broad social welfare.<sup>116</sup>

The key practical implication of a change to a precautionary philosophy is that laws and rules should be drafted to require the financial industry to demonstrate why regulation of activities that affect financial stability is *unnecessary*. This shifting of the regulatory burden would help address the information, resource and expertise constraints faced by financial regulators, and is also calculated to reduce the cognitive capture that is endemic in financial regulation. In a similar vein, a precautionary approach to regulation goes toward addressing some of the collective action problems faced by those who have an interest in financial stability, but do not have the lobbying prowess of the financial industry.

The resources of financial regulators are dwarfed by those of the financial industry,<sup>117</sup> and the shift from a purely microprudential regulatory approach to a macroprudential approach will only exacerbate regulators' informational, expertise and resource constraints: regulators will now need to examine more, and more complicated, information that relates to systemic interactions and trends, as well as individual institutions and products.<sup>118</sup>

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<sup>113</sup> “[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 6 at 1319.

<sup>114</sup> Omarova, *supra* Note 60, at 69.

<sup>115</sup> For examples of these provisions, *see* Note 31.

<sup>116</sup> Dana, *supra* Note 6 at 1329.

<sup>117</sup> “From 1999 to 2008, the financial sector expended \$2.7 billion in report federal lobbying expenses; individuals and political action committees in the sector made more than \$1 billion in campaign contributions.” *See* FCIC Report, *supra* Note 56 at xviii.

<sup>118</sup> 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 31, at 16.

Expertise and resource constraints can be eased to some extent by requiring financial institutions to take the initiative and approach the regulator if they wish to vary their activities (rather than the regulator having to scramble to keep up with financial institutions), and to conduct their own stress tests and other simulations to test the potential systemic effects of such activities. In short, a precautionary approach would shift the burden, and much of the cost, of demonstrating that a financial institution should be able to engage in a particular activity to that institution.

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,”<sup>119</sup> 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,<sup>120</sup> 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.<sup>121</sup> In many circumstances, the most

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<sup>119</sup> Willem H. Buiter, *Central Banks and Financial Crises*, FEDERAL RESERVE BANK OF KANSAS CIY SYMPOSIUM: MAINTAINING STABILITY IN A CHANGING FINANCIAL SYSTEM, 495, 601 (2008). 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.” Arnold Kling, *The Financial Crisis: Moral Failure or Cognitive Failure?*, 33 HARV. J. L. & PUB. POL’Y 507, 509 (2010).

<sup>120</sup> “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 119 at 601-602.

<sup>121</sup> 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 119 at 24.

obvious shortcut is to rely on the expertise (and thus the world view) of the financial institutions that form the financial regulator's constituency.<sup>122</sup>

As a potential solution to capture, McDonnell and Schwarcz have noted the benefits of implanting "regulatory contrarians" within financial regulatory agencies, debiasing those agencies by forcing them 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."<sup>123</sup> In a similar vein, James Kwak has identified a potential solution to 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."<sup>124</sup> 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 are presumptively problematic for financial stability and therefore in need of regulation, unless the institution can demonstrate otherwise.<sup>125</sup> By creating a form of adversarial process between the regulators and the regulated, cognitive regulatory capture groupthink is roiled: the regulator no longer self-identifies as being on the same team as the regulated.<sup>126</sup> 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.<sup>127</sup>

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<sup>122</sup> "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.

<sup>123</sup> McDonnell & Schwarcz, *supra* Note 105 at 1647.

<sup>124</sup> Kwak, *supra* Note 119 at 36.

<sup>125</sup> 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).

<sup>126</sup> 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 119 at 31.

<sup>127</sup> Kwak, *supra* Note 119 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*

Practically speaking, given the “revolving door” between the financial industry and the institutions it regulates,<sup>128</sup> and the necessity of ongoing contact between the two, it is unlikely that the use of the precautionary principle will completely prevail over cognitive regulatory capture in the financial sphere.<sup>129</sup> 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.<sup>130</sup> The financial industry is highly organized and focused on avoiding the short-term costs that it will bear as a result of financial regulation. While almost all members of society have a vested interest in regulation that improves financial stability,<sup>131</sup> 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.<sup>132</sup> The complexity of the financial system itself exacerbates these collective action problems: it allows the financial industry to dismiss the views of outsiders on the

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*Oversight*, 111 COL. L. REV. 795, 821 (2011); McDonnell & Schwarcz, *supra* Note 105 at 1644.

<sup>128</sup> There is a well-acknowledged “revolving door” between regulators and the financial institutions they regulate. As such, it is almost expected that regulators will work within the financial industry after they complete their public service. *Id.* at 17.

<sup>129</sup> 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.

<sup>130</sup> 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.

<sup>131</sup> See text accompany Notes 39-44.

<sup>132</sup> “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 6 at 1332.

grounds that they couldn't possibly understand the complexities of the financial system.<sup>133</sup>

The precautionary principle can have salutary effects in these circumstances. People (regulators included) have a natural bias towards the primacy of immediate, high-probability events.<sup>134</sup> In the context of financial regulation, the immediate high-probability event is an increase in compliance costs for the financial industry.<sup>135</sup> 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.<sup>136</sup> In this sense, the high level of organization and singularity of purpose of lobbyists intensifies the 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.<sup>137</sup> By requiring regulators to think more globally about the possible downsides of a particular financial activity, a precautionary approach encourages regulators to consider a broader, more disparate range of perspectives about what constitutes social welfare.<sup>138</sup> 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.”<sup>139</sup>

There are therefore numerous advantages to regulatory agencies taking a precautionary approach to financial stability regulation. Of course, notwithstanding these advantages, the shift to a new, precautionary philosophy will only occur if there is the political will to enact legislation

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<sup>133</sup> 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 108 at 18.

<sup>134</sup> See text accompanying Notes 91-92.

<sup>135</sup> See text accompanying Notes 96-97.

<sup>136</sup> “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 7 at 1017.

<sup>137</sup> Dana, *supra* Note 6 at 1332.

<sup>138</sup> “The [precautionary principle]’s understanding of costs is much broader than the notion presupposed by [cost-benefit analysis].” Kysar, *supra* Note 6 at 235. “[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 6 at 1319. 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 7 at 1030; 1055.

<sup>139</sup> Dana, *supra* Note 6 at 1329-1330.

that implements it.<sup>140</sup> Convincing society at large, and the financial industry in particular, of the desirability of embracing a precautionary philosophy may be difficult, but the shift is necessary: the extant cost-benefit approach was developed in a time when the financial system was simpler and evolution was slower, and it has become inappropriate in the face of the complexity of modern financial markets.<sup>141</sup> If the true gravity of the harm that can be caused by financial crises is appreciated, the precautionary principle may overcome resistance to change and find broad popular support.<sup>142</sup> While such a precautionary approach to financial regulation is likely to be unpopular with the financial industry (to put it mildly), it is by no means certain that the current cost-benefit philosophy of regulation will be better for the industry in the long-term. While the financial industry may incur compliance costs and forfeit some fee-based income as a result of financial stability regulation in the short-term, it is highly possible that the benefits of any ensuing stability could more than compensate financial institutions for regulatory costs.<sup>143</sup> If financial institutions 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.<sup>144</sup>

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

One type of activity that has the potential to seriously impact financial stability (and that has garnered a lot of attention recently) is financial innovation – it therefore serves as a useful test case for a

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<sup>140</sup> With regard to the implementation of the new philosophy, see Notes 114-116 and accompanying text.

<sup>141</sup> “[W]hen we identify current structures that were path-determined by forces irrelevant to today’s world, we should not accord the current rule or institution a presumption of utility.” Mark J. Roe, *Chaos and Evolution in Law and Economics*, 109 Harv. L. Rev. 641, 667 (1995-1996).

<sup>142</sup> 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 94 at 209-210.

<sup>143</sup> 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 25 at 15. For example, 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](http://www.nytimes.com/2011/10/25/business/banks-flooded-with-cash-they-cant-profitably-use.html?pagewanted=1&_r=2&ref=business)).

<sup>144</sup> For further discussion of reframing policy decisions as choices between gains, see Dana, *supra* Note 6 at 1340-1341.

precautionary approach to financial stability regulation. Given the number and complexity of moving parts in the financial system, it is already very difficult for regulators to figure out how to regulate to preserve financial stability.<sup>145</sup> 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.”<sup>146</sup> 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:<sup>147</sup> 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.<sup>148</sup> Furthermore, much of the theory and many of the models relevant to evaluating financial innovations are proprietary,<sup>149</sup> and often remain unavailable to regulators until they are outdated.<sup>150</sup> 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.

Very recently, Posner & Weyl and Omarova have sought to address these issues by proposing new frameworks for ex ante regulatory evaluation of financial innovations.<sup>151</sup> The proposals made by those authors are of a precautionary bent,<sup>152</sup> but each of their papers expressly disclaims any consideration of whether a precautionary philosophy should inform the regulation of financial innovation.<sup>153</sup> In contrast, in an article on financial innovation written shortly after the Financial Crisis, Robert Litan does expressly consider whether a precautionary approach to clearing financial innovations should be taken. Litan ultimately rejects 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

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<sup>145</sup> Pan, *supra* Note 31, at 42.

<sup>146</sup> *Id.* at 35-36.

<sup>147</sup> Hu, *supra* Note 29, at 1507 (1992-1993).

<sup>148</sup> *Id.* at 1501.

<sup>149</sup> *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.

<sup>150</sup> 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.

<sup>151</sup> 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 60, at 21.

<sup>152</sup> Omarova’s proposal is described as an attempt “to control the proliferation of complex financial products that potentially pose heightened systemic risk.” Omarova, *supra* Note 60, at 48. To do so, she advocates for a precautionary burden shifting, similar to that discussed in this Article: “The applicant entity would bear the burden of showing that the proposed product meets all of the statutory and regulatory criteria for approval.” *Id.* at 67. Posner’s & Weyl’s proposal is to only allow financial institutions to market new products if they are shown to have social utility. Posner & Weyl, *supra* Note 151, at 3.

<sup>153</sup> Omarova, *supra* Note 60, at 21; Posner & Weyl, *supra* Note 151, at 4.

sufficiently catastrophic.<sup>154</sup> This Article has already reached the contrary conclusion that the potential consequences of a financial crisis can indeed be catastrophic;<sup>155</sup> this Section will consider in detail the concerns Litan raises about a precautionary approach chilling innovation.

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

It is generally accepted that 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.<sup>156</sup> 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.<sup>157</sup> However, it is important to realize 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 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.<sup>158</sup> MBSs are a way of facilitating capital intermediation,

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<sup>154</sup> “[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 18 at 45.

<sup>155</sup> See the text accompanying Notes 39-44.

<sup>156</sup> See the text accompanying Notes 21-25.

<sup>157</sup> 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 20 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 47 at 314-315. Limitations on innovation could potentially reduced these benefits.

<sup>158</sup> “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

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 assets is a much more attractive investment proposition because it allows for greater diversification and liquidity).<sup>159</sup> However, the Financial Crisis demonstrated that both CDSs and MBSs posed grave threats to systemic stability: CDSs because they increased the amount of leverage and interconnectedness in the financial system,<sup>160</sup> and MBSs because they fuelled an unsustainable housing bubble by generating an uncontrolled appetite for residential mortgages.

Regulators therefore need to consider how innovations that purport to effect capital intermediation and risk management affect systemic stability and thus broader economic growth, and regulate them accordingly.<sup>161</sup> Accordingly, financial innovations should be evaluated using a two-step inquiry:

- first, does the innovation actually improve capital intermediation and/or risk management; and
- second, if the innovation does improve capital intermediation and/or risk management, is that improvement sufficient to justify any systemic risks posed by the innovation.

Such an approach 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.

Starting with the first level of inquiry, 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.<sup>162</sup> While this is sometimes the case, authors like Adair Turner

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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 40 at 153.

<sup>159</sup> 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](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1951187))

<sup>160</sup> For further detail, see text accompanying Notes 229-232.

<sup>161</sup> 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 25 at 6.

<sup>162</sup> “Innovation in financial intermediation improves efficiency by completing markets, lowering transaction costs, and reducing agency costs.” Merton, *supra* Note 21 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

and Dan Awrey have challenged the proposition that this is *always* the case (and hence that innovation is *always* socially utile).<sup>163</sup> 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.*<sup>164</sup>

Awrey's theory is that some financial innovations are driven by the financial institutions that *supply* financial innovations, rather than by any investor demand or market need.<sup>165</sup> Awrey argues that because most financial innovations are not covered by any intellectual property-type protection, there is no guarantee that the developing financial institution will have a long-term monopoly on the profits of an innovation.<sup>166</sup> 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.<sup>167</sup> 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.<sup>168</sup> 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.<sup>169</sup> This latter strategy also enables financial institutions to charge a premium on their analysis and dealer functions:<sup>170</sup> where a product

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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 25.

<sup>163</sup> Awrey, *supra* Note 108; Turner, *supra* Note 25.

<sup>164</sup> Turner, *supra* Note 25 at 22.

<sup>165</sup> Awrey, *supra* Note 108 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 network at a cost in terms of stability, with no welfare gain because market completeness has already been achieved.” Haldane & May, *supra* Note 61 at 352.

<sup>166</sup> Awrey, *supra* Note 108 at 38-39.

<sup>167</sup> *Id.* at 6; 34. Rajan notes that “excess returns in more traditional investments have been competed away.” Rajan, *supra* Note 47 at 324.

<sup>168</sup> Hu, *supra* Note 29, 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 21 at 803.

<sup>169</sup> Awrey, *supra* Note 108 at 35-36. For a discussion of the incentives for financial institutions to increase the level of complexity, see Utset, *supra* Note 21 at 828.

<sup>170</sup> Awrey, *supra* Note 108 at 36.

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’.”<sup>171</sup> While 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.<sup>172</sup> Regulation that stifles purely supply-driven innovations will not be socially damaging.

Even where innovations are driven by genuine demand, they may be problematic if they concentrate risk with investors who do not truly appreciate the risk that they are taking on.<sup>173</sup> Investors often seek investments that are capable of increased return without a commensurate increase in risk, but a higher return usually does require higher risk.<sup>174</sup> Therefore, to satisfy demand for seemingly higher-yield, lower-risk products, financial institutions often use financial engineering to consolidate risk in the tail<sup>175</sup> where investors are notoriously likely to disregard it (both because of a human tendency to ignore tail risk,<sup>176</sup> 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).<sup>177</sup> For

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<sup>171</sup> *Id.* at 35.

<sup>172</sup> In fact, much of recent financial innovation has facilitated capital intermediation within the financial sector, but not to the broader economy. “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 61 at 351.

<sup>173</sup> Gennaioli et al., *supra* Note 103, at 2.

<sup>174</sup> “[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 26 at 3.

<sup>175</sup> 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 47 at 316. See also Gennaioli et al., *supra* Note 103, at 2.

<sup>176</sup> See Note 103 and accompanying text.

<sup>177</sup> 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 106 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

example, a product like a collateralized debt obligation (“CDO”) takes the theory behind an MBS (a security backed by a diversified pool of mortgages) and applies it by pooling assets that are much more complicated than mortgages (in fact, some of the assets that back CDOs may in fact be MBSs). Financial engineering is applied to generate different tranches of securities from the same asset pool, such that the top tranches appear to be risk free and receive the highest possible credit ratings (equivalent to U.S. government bonds).<sup>178</sup> The true risk inherent in the top tranches of CDOs only became evident during the tail event that was the Financial Crisis, when they proved to be much riskier than U.S. government bonds.

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,<sup>179</sup> and the instrument is likely to be wildly popular, being “over-issued relative to what would be possible under rational expectations.”<sup>180</sup> Where an innovation obfuscates information about the risks being purchased by an investor, then the innovation does not effect any socially utile risk allocation function, and regulation that chills such innovations will not be socially costly.

We do not need to concern ourselves with the level of threat to systemic stability posed by the types of innovations discussed above, because in the absence of any social utility to recommend them, regulation that limits the use of 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, the calculus is more difficult. We must then turn to the second step of our precautionary inquiry, and consider

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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).

<sup>178</sup> Gennaioli et al., *supra* Note 103, at 2-3.

<sup>179</sup> For further discussion, see *Id.* at 31.

<sup>180</sup> *Id.* 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, 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 readily accepted as collateral between counterparties and this will further increase the popularity of the instrument.

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 deliberations undertaken in this second step will need to be informed by 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). The experience of the Financial Crisis does, however, give 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,<sup>181</sup> compounds the complexity of the financial system.<sup>182</sup> 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.<sup>183</sup> Market participants must therefore make decisions very quickly<sup>184</sup> which leaves little time for reflection, and so increases reliance on common shortcuts like heuristics, credit ratings and computer models, in place of an informed and reasoned opinion of the underlying risk and value of the product.<sup>185</sup> The complexity of the products themselves also encourages reliance on these same shortcuts,<sup>186</sup> particularly if products are new, unfamiliar and

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<sup>181</sup> Merton, *supra* Note 21 at 28; *See* Litan, *supra* Note 18 at 5.

<sup>182</sup> Awrey, *supra* Note 108 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 61 at 351.

<sup>183</sup> “[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 108 at 48. “In a complex system, signals are sometimes inadvertently transmitted too quickly to control.” Schwarcz, *Regulating Complexity*, *supra* Note 20 at 215.

<sup>184</sup> “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 21 at 802.

<sup>185</sup> “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 reduce to usable numbers.” Schwarcz, *Regulating Complexity*, *supra* Note 20 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 21 at 827.

<sup>186</sup> “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 20 at 223. *See also* Utset, *supra* Note 21 at 783; Awrey, *supra* Note 108 at 9; Dana, *supra* Note 6 at 1332; Rajan, *supra* Note 47 at 343 (more complicated instruments are capable of generating more uncertainty).

untested.<sup>187</sup> Given that heuristics and computer models tend to underestimate low-probability high-impact tail events (such as loss of liquidity) in similar ways,<sup>188</sup> 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.<sup>189</sup>

Should a tail event occur, market participants are likely to panic and seek to sell their less liquid investments (often, these are innovative new products) so as to move to more reliable, liquid and transparent assets.<sup>190</sup> So-called “fire sales” of any type of financial instrument are likely to be destructive of their value,<sup>191</sup> especially when there is not a deep liquid market for those instruments. Investment and commercial banks that originate the new products are likely to keep the most complicated tail risks on their books,<sup>192</sup> which means that they will be hit hardest by a tail event. Banks are also the traditional providers of liquidity for the market (i.e. they are the natural buyers when other investors want to sell their instruments),<sup>193</sup> with the result that in a fire sale, they will end up acquiring many of the new financial products that they developed, even as the value of these instruments decreases.<sup>194</sup> The resulting losses from these products will

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<sup>187</sup> 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 151, 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 103, at 6.

<sup>188</sup> See Rajan, *supra* Note 47 at 343; Gennaioli et al., *supra* Note 103, at 4.

<sup>189</sup> 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 103, 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 108 at 48 (Note 201).

<sup>190</sup> Rajan, *supra* Note 47 at 346.

<sup>191</sup> Gennaioli et al., *supra* Note 103, at 24.

<sup>192</sup> Rajan, *supra* Note 47 at 326. This is especially likely to have occurred if regulators were also blinded to the real risks of the innovation and accorded low risk-weightings to the instruments for the purposes of calculating regulatory capital requirements.

<sup>193</sup> Rajan, *supra* Note 47 at 346.

<sup>194</sup> Gennaioli et al., *supra* Note 103, 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 instruments known as collateralized debt obligations

impede the ability of financial institutions to engage in socially useful capital intermediation and risk management functions in the long run.<sup>195</sup>

Economic prosperity is endangered when increasingly complex products are embedded into the financial system, because these products are highly susceptible to panics that can compromise financial institution stability and thus broader economic growth – this should caution against the introduction of any unnecessarily complex new product into the system. In addition to increasing complexity, innovations that allow for improved risk allocation may prove problematic for financial stability if they increase the amount,<sup>196</sup> or obscure the allocation,<sup>197</sup> of risk within the financial system. With regard to capital intermediation innovations, in addition to increasing complexity, these can inflate harmful bubbles by channeling credit flows to non-productive investments.<sup>198</sup> By way of example, Turner cites the credit that is used to finance the acquisition of residential and commercial property (this is the type of credit that was generated by the proliferation of MBSs prior to the Financial Crisis): only a proportion of real estate investment 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.<sup>199</sup> The 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,<sup>200</sup> and can fuel real estate bubbles that jeopardize systemic stability.<sup>201</sup>

Accordingly, 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 a number of factors including (and this is by no means an exhaustive list), (i) the extent to which the innovation increases complexity,

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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 177 at 77.

<sup>195</sup> “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 103, at 36.

<sup>196</sup> “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 47 at 327.

<sup>197</sup> *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 61 at 351-352; Awrey, *supra* Note 108 at 21.

<sup>198</sup> Turner, *supra* Note 25 at 17.

<sup>199</sup> *Id.*

<sup>200</sup> *Id.*

<sup>201</sup> Over the years, a large number of financial crises appear to have been precipitated by real estate bubbles. *See* Reinhart & Rogoff, *supra* Note 22 at 158-162.

(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). Weighing these concerns is by no means a precise science – the development of regulatory solutions to financial innovation will necessarily involve precautionary value judgments about how to allow useful innovation while still maintaining systemic stability. For example, concerns about 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 by mandating regulatory disclosure, at least to some extent. Real estate and other asset bubbles could perhaps be addressed by adjusting interest rates or tax incentives. However, concerns about increases in complexity can only be dealt with by limiting the introduction of new innovations into the financial system. Section 5 of this Article provides some preliminary thoughts on the practicalities of instituting such limits.

### *B. Ancillary Benefits of a Precautionary Approach to Financial Innovation*

Both Posner & Weyl and Omarova have recently advocated the implicitly precautionary approach of *ex ante* vetting of financial innovation.<sup>202</sup> If such an approach were implemented, the financial industry 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.<sup>203</sup> The regulator would therefore have more timely information and a broader view of the use of new products in the financial system.<sup>204</sup> Regulators could also require an innovator to conduct stress tests

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<sup>202</sup> Posner & Weyl, *supra* Note 151; Omarova, *supra* Note 60,

<sup>203</sup> Dan Awrey notes that “the pace of innovation has left financial regulators and regulation chronically behind the curve.” Awrey, *supra* Note 108 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.

<sup>204</sup> An argument could be made that it is unnecessary to confer any power on regulators to control the entry of new innovations into the market – rather, 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

and consider the systemic consequences of any new financial product<sup>205</sup> 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.<sup>206</sup>

If regulators are receiving information about financial innovation from the financial industry, though, 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). Particularly when dealing with new and very complex financial products, absent precautionary regulation, the industry is in a position to convince its regulators of the need for conclusive proof of the dangers posed by a new product before regulation is imposed.<sup>207</sup> This kind of cognitive capture was particularly effective in preserving the non-regulated status quo prior to the Financial Crisis:<sup>208</sup> in the lead-up to the Financial Crisis, regulators often internalized the worldview of financial institutions with regard to financial innovations like CDSs and MBSs and even played a facilitatory role in their expansion<sup>209</sup> – “[I]ike the bankers

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market participants and even the regulators themselves, especially in times of rising asset prices.” Omarova, *supra* Note 60, at 75.

<sup>205</sup> 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 177 at 74.

<sup>206</sup> “[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 6 at 238.

<sup>207</sup> “Rapid innovation in the financial sector pushed regulators to make decisions regarding new activities such as complex derivatives where neither existing statutes nor previous regulatory actions provided much guidance; the increasing complexity of finance made it more difficult for agency employees to evaluate proposals on their merits, increasing the importance of proxies.” Kwak, *supra* Note 119 at 32.

<sup>208</sup> “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.” Buiter, *supra* Note 119 at 495, 602.

<sup>209</sup> Speaking about financial innovation in 2006, Federal Reserve Chairman Ben Bernanke made the facilitatory role of financial regulators clear: “[b]anks and other market participants have made many of the key innovations in risk measurement and risk management, but supervisors have often helped to adapt and disseminate best practices to a broader array of financial institutions.” Ben S. Bernanke, Chairman, Fed. Res. Sys., Modern Risk Management and Banking Supervision, Speech at the Stonier Graduate School of Banking, Washington D.C. (June 12, 2006) (available at <http://www.federalreserve.gov/newsevents/speech/bernanke20060612a.htm>).

themselves, the regulators believed that these innovations were making financial intermediation safer and more efficient.”<sup>210</sup>

*Ex ante* precautionary review of financial innovations would mitigate the potential for cognitive capture of financial regulators. First, it seems that once financial products become well-established in the marketplace, the desire for regulators to oppose such products decreases.<sup>211</sup> 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).<sup>212</sup> 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).<sup>213</sup> 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:<sup>214</sup> “firms 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.”<sup>215</sup> 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 to 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 that does not seem likely to pass muster).<sup>216</sup>

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<sup>210</sup> Kling, *supra* Note 119 at 515.

<sup>211</sup> Kenneth C. Kettering, *Securitization and its Discontents: The Dynamics of Financial Product Development*, 29 CARDOZO L. REV. 1553, 1650 (2007-2008).

<sup>212</sup> 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

<sup>213</sup> See text accompanying Notes 91-97. More generally, see Dana, *supra* Note 6.

<sup>214</sup> Hu, *supra* Note 29, at 1482.

<sup>215</sup> Schwarcz, *Regulating Complexity*, *supra* Note 20 at 221-222.

<sup>216</sup> 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

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.<sup>217</sup> Precautionary regulation may thus cause a financial institution to abandon an innovation when it has little to offer but its “newness”.<sup>218</sup> 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.<sup>219</sup>

### C. Regulation of CDSs in a Parallel Precautionary Universe

The CDS was one of the most important financial innovations developed prior to the Financial Crisis. Before the Financial Crisis, it was heralded by most as “a mechanism for transferring risk efficiently around the system”,<sup>220</sup> and attempts to regulate it were staunchly rebuffed.<sup>221</sup> As the Crisis unfolded, however, the CDS became broadly vilified as a “weapon of mass destruction,”<sup>222</sup> 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 swaps, including CDSs. A brief sketch of the history of swaps regulation in the United States suggests how a

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confront weaknesses in their pricing, risk assessment and hedging systems.” Hu, *supra* Note 29, 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>.

<sup>217</sup> See Note 168 and accompanying text.

<sup>218</sup> For further discussion of the accelerated pace of innovation creating innovations that are not socially useful, see Awrey, *supra* Note 108 at 35.

<sup>219</sup> See the text accompanying Notes 181-189. Furthermore, 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 whole) will be less susceptible to irrational losses in confidence. Reinhart & Rogoff, *supra* Note 22 at xlv.

<sup>220</sup> Tim Frost, former European Head of Credit Trading, Sales and Research at JPMorgan, as cited in Tett, *supra* Note 180 at 86.

<sup>221</sup> See Notes 223-224 and accompanying text.

<sup>222</sup> 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>).

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

In May of 1998, Brooksely Born, Chairperson of the Commodity Futures Trading Commission, issued a concept release seeking input regarding the regulation of over-the-counter derivatives (including CDSs). 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.<sup>223</sup>*

The stance of this press release strikes a balance between a cost-benefit and a precautionary approach. It 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

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<sup>223</sup> 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>)

means to retain the burden of showing that regulation is necessary, and 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 this weak form of the precautionary principle to OTC derivatives was harshly and publicly condemned by the industry, and more unusually, by other regulators.<sup>224</sup> 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.<sup>225</sup> In a parallel precautionary universe, 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 universe, the CFTC would not have presumed CDSs to be beneficial just because they facilitated risk management.<sup>226</sup> 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:<sup>227</sup> in effect the CFTC would have been directed to act as advocate for those who have a stake in financial stability but cannot influence the rulemaking process because of collective action problems.<sup>228</sup> Because a precautionary approach shifts the

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<sup>224</sup> 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 56 at 47.

<sup>225</sup> FCIC Report, *supra* Note 56 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 211 at 1645 (2007-2008).

<sup>226</sup> See Section 4(a) *infra*.

<sup>227</sup> 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 21 at 825.

<sup>228</sup> 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>).

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.

One of the key problems posed by CDSs in the Financial Crisis was their multiplier effect: many CDSs could be written against a single debt instrument, thus exponentially multiplying the amount of market exposure to a default by the issuer of that debt instrument.<sup>229</sup> The purchasers of the CDSs were not required to have any interest in the underlying debt instrument,<sup>230</sup> and so new parties could become interconnected with the issuer of the reference debt instrument without having any direct dealings with that issuer. The only limitation on the number of CDSs issued with respect to a debt instrument was the willingness of sellers to write CDS protection, 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,<sup>231</sup> they had little incentive to stop writing protection.<sup>232</sup>

Any requirement that CDS purchasers have an “insurable interest” in the underlying debt instrument,<sup>233</sup> or any regulatory capital or margin requirements for CDSs, 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, Kristin 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.<sup>234</sup> Mandatory clearing would also have improved the transparency of CDS markets prior to the Financial Crisis: in the absence of any clearing or disclosure requirements, regulators had no informed idea

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<sup>229</sup> See JOHN GEANAKOPOLOS, 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](http://fcic-static.law.stanford.edu/cdn_media/fcic-testimony/2010-0226-Geanakoplos.pdf)

<sup>230</sup> FCIC Report, *supra* Note 56 at 50.

<sup>231</sup> “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 56 at 50.

<sup>232</sup> Richard Portes, *Ban Naked CDS* (March 18, 2010) (available at <http://economistsview.typepad.com/economistsview/2010/03/ban-naked-cds.html>)

<sup>233</sup> Posner & Weyl, *supra* Note 151, at 23.

<sup>234</sup> “[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 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).

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 regulation of CDSs would have resulted in 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 have 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.<sup>235</sup> As a result, only a small number of players can truly reap the rewards of innovating derivatives,<sup>236</sup> and those rewards contribute 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. These private costs therefore would 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 they 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.<sup>237</sup> CDS advocates argue that even speculative use of CDSs is beneficial because it provides liquidity and serves an informational signaling function.<sup>238</sup> In contrast, detractors view the utility of CDSs as a hedging tool more skeptically, concluding that the instrument is devoid of any real use other than antisocial speculation.<sup>239</sup> Others take the middle ground, and believe that “covered” CDSs that are used for hedging are a useful innovation, whereas “naked” CDSs (i.e. where the purchaser of the CDS has no interest in the underlying debt instrument) have no social utility and

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<sup>235</sup> Rajan, *supra* Note 47 at 330-331.

<sup>236</sup> FCIC Report, *supra* Note 56 at 50.

<sup>237</sup> CDSs are also said to provide liquidity and serve an informational purpose. See Litan, *supra* Note 18 at 41-42.

<sup>238</sup> *Id.*

<sup>239</sup> Posner & Weyl, *supra* Note 151, at 22.

should be banned.<sup>240</sup> 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 at least utility would not have been the sole criterion on which the CDS was judged. If the CFTC had concluded that the CDS had social utility, 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 margin, disclosure or clearing requirements. These types of regulations would have helped address concerns about CDSs multiplying and obscuring risk in the financial system. However, these types of regulations would not entirely have addressed the added complexity (especially in the form of increased interconnectedness of actors) that CDSs brought to the financial system. The CFTC would have had to make a further value judgment as to whether the increase in complexity outweighed any contributions that CDSs made to social utility, such that a ban on the product should have been put in place.

##### 5. SOME PRACTICAL THOUGHTS ON THE REGULATION OF FINANCIAL INNOVATION

This Article does not propose a detailed practical model for precautionary review of all financial activities that can affect stability – it is intended more to inspire debate about the type of philosophy that should inform the work of our financial regulators. However, the practicalities of implementing a precautionary philosophy 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.<sup>241</sup> Recent work by Posner & Weyl and Omarova on developing models for financial product approval serves as a useful starting point in this endeavor.

In their paper, Eric Posner and E. Glen Weyl propose that financial institutions be forbidden to market new financial products unless such

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<sup>240</sup> Richard Portes, *supra* Note 232.

<sup>241</sup> The following thoughts on structures for regulating financial innovation are limited in their application to United States financial institutions. However, 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 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.<sup>241</sup> For further discussion of shadow banking, *see* Gorton & Metrick, *supra* Note 18. 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).

products are approved by a regulatory agency equivalent to a financial “FDA”.<sup>242</sup> 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 (which in Posner’s & Weyl’s view makes the innovation socially utile) or speculative purposes (which in their view renders the innovation inutile).<sup>243</sup> In the absence of demonstrable social utility, Posner & Weyl argue that regulators should ban a new product.<sup>244</sup> 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)<sup>245</sup> which assist determinations of whether a product genuinely facilitates risk management and/or capital formation, or is lacking in social utility.

However, Posner & Weyl note that their model largely ignores the issue of systemic risk,<sup>246</sup> which is the primary focus of this Article. It is quite possible that a financial product, even if it is used for legitimate hedging purposes (and is therefore socially utile), could create systemic risk. For example, a hedging 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. When considering the more nuanced and less certain concept of systemic risk, it may prove best if regulators are provided with a flexible arsenal of approaches, rather than limiting them to a ban.<sup>247</sup> For example, if a new product seems like it will be beneficial but regulators are still somewhat concerned about the risks it may pose to stability, regulators could exercise their precaution by permitting the product but according it a higher risk-weighting for capital adequacy purposes, or by subjecting it to some type of financial transaction tax, or by forbidding credit rating agencies to give the product a high rating. All of these measures could be revised over time if the product showed itself to work well or badly in strenuous stress tests or actual crisis situations. And of course, regulators would still have the discretion to ban a product that has no

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<sup>242</sup> Posner & Weyl, *supra* Note 151, at 1.

<sup>243</sup> *Id.* at 2. This Article will not enter into the ongoing debate regarding the social utility of speculation.

<sup>244</sup> 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 151, at 18-31.

<sup>245</sup> *Id.* at 36.

<sup>246</sup> *Id.* at 6.

<sup>247</sup> Although restricting regulators to saying “yea or nay” about a new product is certainly attractive in some respects: an outright ban is likely to be more economical for regulators than trying to understand the issues posed by a complex activity and attempting to tailor appropriate disclosure, clearing, capital, etc. requirements to it (and then supervising compliance with such requirements). Pan, *supra* Note 31, at 43-45. Furthermore, blunt regulatory action can reduce compliance costs (and provide certainty) for the regulated industry. *Id.* at 24-25.

demonstrable social utility, poses too much systemic risk, or is simply too complex to understand.<sup>248</sup>

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")<sup>249</sup> with the discretion to ban or to conditionally approve new financial products.<sup>250</sup> 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.<sup>251</sup> 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."<sup>252</sup> Accordingly, Omarova's proposal can be used to envision how a precautionary philosophy might be implemented. 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:<sup>253</sup> 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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<sup>248</sup> Pan has argued that "[i]n such cases where the regulator can only wave the white flag and admit that an area of the financial markets exceeds its regulatory capacity, a logical response is to prohibit the activity altogether." Pan, *supra* Note 31, at 45. When a product is exceedingly complex, it is possible that neither the regulators nor the financial institution that developed the product truly understands it. Hu pithily describes this problem as "How can the blind guide the nearsighted?" Hu, *supra* Note 29, at 1463.

<sup>249</sup> 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 60, at 65-70.

<sup>250</sup> *Id.* at 68.

<sup>251</sup> *Id.* at 70-71. Omarova suggests that civil and criminal penalties, as well as disqualification from certain lines of business, might also be appropriate.

<sup>252</sup> *Id.* at 68.

<sup>253</sup> *Id.* at 52.

*core motivation for the product user (or the applicant firm) to enter into the proposed transaction.*<sup>254</sup>

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?"<sup>255</sup> 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.<sup>256</sup>

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."<sup>257</sup> 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. 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."<sup>258</sup> This shifts the regulatory burden to the financial industry, thus favoring the regulation of financial innovation. Accordingly, Omarova's proposal serves as a very good example of how a precautionary philosophy might be operationalized.

One final issue relevant to both Omarova's proposal and the Posner/Weyl proposal is how to determine when a financial instrument is "new", such that it needs pre-approval. Because these instruments can often

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<sup>254</sup> *Id.* at 53. Interestingly, 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 235-236.

<sup>255</sup> *Id.* at 58.

<sup>256</sup> *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).

<sup>257</sup> *Id.* at 57.

<sup>258</sup> *Id.* at 59.

be characterized alternatively as either a new type of financial instrument or as the sum of existing financial instrument parts,<sup>259</sup> it is difficult to demarcate the point at which a new use of an existing instrument becomes a *sui generis* new instrument. If precautionary regulation were applied only to the development of new products, and not to new uses of existing instruments, that would inevitably lead to arbitrage activity. Think, for example, of CDSs. Imagine that these had not yet been introduced into the market, but an enterprising bank has just developed them. The bank wants to introduce these into the market, but if they are characterized as a new product, then they will be subject to a precautionary evaluation. The bank wants to avoid this, so it seeks to characterize a CDS as the sum of its building blocks, rather than as a new product – it would simply say that the CDS is simply a new application (i.e. to credit) of a non-exchange traded bilateral forward contract.<sup>260</sup> For this reason, to be effective, any precautionary regulatory scheme would have to apply to both the creation of new instruments and to creative new uses of existing instruments.

Omarova suggests that regulators should look at key terms related to payment, party obligations, the nature of any reference assets, intended uses and target markets in making determinations of when one product stops and another begins.<sup>261</sup> Henry Hu's early work on the categorization of derivatives may also be of some assistance here. He suggests (but acknowledges the potential cost of) "establishing an initial catalogue of known OTC derivatives, broken down by genus, family and species. The catalogue would need to be updated regularly, again with the cooperation of the industry."<sup>262</sup> This type of catalogue could be prepared for all existing financial products – while this would be a cost and time intensive exercise at the outset, once the catalogue were established, its maintenance would be much less costly. The catalogue would need to be sufficiently specific that it captures not only the name of each product subspecies, but also the way in which that subspecies is traditionally used.<sup>263</sup> Subsequently, if any market participant wanted to issue or underwrite a financial product that is not currently in the catalogue, or issue or underwrite a financial product for a use other than that specified in the catalogue, that market participant would need to approach the regulator to seek approval to do so.

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<sup>259</sup> 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. Gennaioli et al., *supra* Note 103, at 2.

<sup>260</sup> For a discussion of the building blocks of swap contracts, *see* Hu, *supra* Note 29, at 1467.

<sup>261</sup> Omarova, *supra* Note 60, at 61.

<sup>262</sup> Hu, *supra* Note 29, at 1506-1508.

<sup>263</sup> The Posner/Weyl proposal anticipates a similar type of exercise: "Our tentative view is that the inventor of the initial [product] should be required to obtain agency approval. In the case of a financial product with many potential uses, the agency may determine that it will be approved only for certain uses." Posner & Weyl, *supra* Note 151, at 39.

## 6. CONCLUSION

This Article has established the necessity for financial stability regulation to be informed by a precautionary philosophy: 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 implementing 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 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.