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The Road to Precautionary Review of Financial Products

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Financial innovation introduces new and complex products into the financial system, providing market participants with more bespoke ways to manage their risk, return and liquidity. However, by increasing the complexity of the financial system, financial innovation also compromises financial stability. Faced with the rapid pace of financial innovation, regulators have two options. One is to seek to meet the complexity of the industry with complex regulation, in an arms race that under-resourced regulators are bound to lose. The less explored (and more controversial) path is for regulators to try to reduce the complexity of the financial system by limiting financial innovation through a pre-approval process for new financial products. This Essay surveys and adds to the proposals that have been advanced for such precautionary pre-approval of new financial products, focusing on the political and technical challenges that such proposals face.

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I. INTRODUCTION

There are many who argue that if sophisticated institutional investors want to risk their money on complex financial products, then they should be allowed to do so, and the law should not interfere.² However, this

¹ Associate Professor, Suffolk University Law School. This Essay reflects numerous conversations regarding financial product pre-approval regimes, particularly those conducted at the Mandatory Approval of Financial Instruments International Workshop in Brussels, Belgium sponsored by the World Future Council and the EU Office of the Friederich-Ebert-Stiftung; the Gruter Institute for Law and Behavioral Research Conference in Squaw Valley, California; and the Sydney Law School/Australian Securities and Investments Commission Seminar on Regulating Complex Financial Products in Sydney, Australia. Thanks go to the organizers of, and participants in, each of those events – especially Professor Saule Omarova and ASIC Commissioner Greg Tanzer, who provided helpful comments on this Essay.

² Such belief perhaps reached its zenith with the enactment of the Commodity Futures Modernization Act of 2000 (Pub. L. No. 106-554, 114 Stat. 2763 (2000)), which “expressly removed credit default swaps from the direct authority of relevant financial markets regulatory agencies.” Kristin N. Johnson, *Things Fall Apart: Regulating the Credit Default*

perspective ignores the experience of the financial crisis of 2007-2008 (the “Financial Crisis”), which vividly illustrated the externalities that complex financial products can create.³ Such externalities, rather than the welfare of the counterparties themselves, are the primary focus of financial stability regulation.⁴ This Essay focuses in particular on the risks to financial stability posed by the increasing complexity of the financial system, and on the proposals that have been made to mitigate such risks with a pre-approval regime for financial products.

The introduction of new financial products exacerbates the complexity of what is already a hugely complex financial system. As Section II of this Essay explores, complexity poses a real threat to financial stability. Such complexity increases the number of feedback loops that speed the transmission of shocks through the financial system, and it also makes the financial system and the linkages between institutions therein opaque to regulators and to market participants. Currently, disclosure regulation is the favored method of addressing new financial products, but such regulation is limited in its ability to address the problems posed by complexity. Instead, complexity is best dealt with by precautionary regulation that aims to simplify the financial system – by limiting the new products that enter into that system. The concept of precaution is elaborated upon in Section III. In recent years, there have been two proposals advanced for pre-approval of financial products that focus on limiting complexity, rather than on consumer protection. These are briefly explored in Section IV. The first, advanced by Posner & Weyl, seeks to limit products that are purely speculative in nature – but it is not concerned with the systemic risks created by financial products.⁵ The second, advanced by Omarova, is more concerned with such systemic risks – this proposal is a better fit with this Essay’s concerns regarding financial stability.⁶

Section V of this Essay considers the political and technical impediments to implementing precautionary review for new financial products. Political willingness to implement such a regime is likely to reflect prevailing attitudes to similarly precautionary regimes, like environmental regulation. At present, the European Union seems the more

Swap Commons, 82 COLO. L. REV. 167, 221 (2011). Although this ideology was shaken somewhat by the Financial Crisis, “the belief that lightly regulated financial markets are good for the economy...was dogma from the 1990s until 2008 and has survived the financial crisis surprisingly intact”. James Kwak, *Incentives and Ideology*, 127 HARV. L. REV. F. 253, 257 (2014).

³ For a discussion of the social costs that can result from financial system failure, see Hilary J. Allen, *Putting the “Financial Stability” In Financial Stability Oversight Council*, 76 Ohio St. L. J. __, __ (2015).

⁴ *Id.* at __.

⁵ Eric A. Posner & E. Glen Weyl, *An FDA for Financial Innovation: Applying the Insurable Interest Doctrine to Twenty-First-Century Markets*, 107 NW. U. L. REV. 1307 (2013).

⁶ Saule T. Omarova, *License to Deal: Mandatory Approval of Complex Financial Products*, 90 WASH. U. L. REV. 64 (2012).

likely candidate to implement such a regime, whereas the United States seems less amenable.⁷ However, transatlantic regulatory coordination is likely to be a prerequisite for an effective pre-approval regime (the outcome of negotiations on the Transatlantic Trade and Investment Partnership that are currently being undertaken by the United States and Europe may therefore have some bearing on the feasibility of the proposals in this Essay). With regard to technical issues, the greatest impediment to a product pre-approval process is the lack of any existing taxonomy of financial products that could be used to determine whether a product is “new” and thus requires approval. Section V.B therefore uses insights from biology to suggest how such a catalogue of financial products could be structured. Even if there is insufficient political will to implement a pre-approval regime, such a catalogue could be enormously helpful in the monitoring of systemic risks in the financial system.

II. THE PROBLEM OF COMPLEXITY

Complexity limits the ability of regulators and market participants to understand financial products, and to understand how such products link different financial institutions to each other.⁸ As such, the opacity created by complexity is generally recognized as posing a challenge both to financial stability regulation and to market discipline.⁹ However, it is perhaps underappreciated that complexity is *in and of itself* a destabilizing force – this Section will briefly unpack the threats that complexity poses to the financial system.

The more complex financial products that are introduced into the financial system, the more linkages there are between financial institutions. For example, when a financial institution enters into a complex financial contract like a credit default swap, a linkage is created not only between the counterparties to the credit default swap contract, but also between each of those counterparties and the issuer of the underlying debt contract that is referenced by the swap.¹⁰ “[c]ross-system complexity has exploded over recent decades due to the growth in opaque, intra-financial system chains of

⁷ Conventional wisdom is that Europe is much more amenable to precautionary regulation than the United States. In 2003, the head of the United States’ OIRA described the precautionary principle as “a mythical concept, perhaps like a unicorn.” Noga Morag-Levine, *The History of Precaution*, 62 AM. J. COMP. L. 1095, 1096 (2014).

⁸ “[C]omplexity renders the system increasingly opaque to reasoned human cognition, making it more difficult to make thoughtful judgments about where risk lies.” Hilary J. Allen, *The Pathologies of Banking Business As Usual*, 17 U. Pa. J. Bus. L. 861, 872 (2015).

⁹ David Min, *Understanding the Failures of Market Discipline*, 92 WASH. U. L. REV. ___, (2015).

¹⁰ Products like these “increase[] dramatically the number of possible configurations of contracts and the possible outcomes”. Stefano Battiston, Guido Caldarelli, Robert M. May, Tarik Roukny and Joseph E. Stiglitz, *The Price of Complexity in Financial Networks*, 18 (Apr. 20, 2015) (available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2594028).

exposure”.¹¹ Furthermore, when an underlying contract becomes the reference asset for a swap (or is bundled together with other contracts in an asset securitization), it becomes harder to modify that underlying contract.¹² The contracts that underlie complex financial products therefore become more rigid, and on a large scale, increased rigidity can render the financial system less able to absorb shocks.¹³

Linkages between institutions can also function as feedback loops, speeding up and amplifying the transmission of shocks throughout the financial system.¹⁴ As Schwarcz has illustrated by analogy to complex engineering systems, “in a complex system, signals are sometimes inadvertently transmitted too quickly to control.”¹⁵ Given the speed with which shocks can be transmitted through a financial system filled with such interconnections, both market participants and regulators will be forced to react very quickly if such a shock does occur.¹⁶ When they lack time to make an informed decision about the value of a product, market participants and regulators are forced to rely on shortcuts like rules-of-thumb and computer programs.¹⁷ The opacity created by complexity encourages reliance on these same shortcuts, which tend to respond to low-probability (but potentially high-impact) shocks in similar ways.¹⁸ Broad-based

¹¹ Andrew G. Haldane, Exec. Dir., Fin. Stability, Member, Fin. Policy Comm. & Vasileios Madouros, Economist, Bank of Eng., Speech at Federal Reserve Bank of Kansas City’s 36th Economic Policy Symposium: The Dog and the Frisbee, 18 (Aug. 31, 2012) (available at <http://www.kansascityfed.org/publicat/sympos/2012/ah.pdf>).

¹² Kathryn Judge, *Fragmentation Nodes: A Study in Financial Innovation, Complexity and Systemic Risk*, 64 STAN. L. REV. 657, 709 (2012)

¹³ Pistor has written about the importance of including “safety valves” in financial contracts to allow such contracts to adapt to crisis circumstances. Katharina Pistor, *A Legal Theory of Finance*, 41 J. COMP. ECONOMICS 315, 329 (2013).

¹⁴ Steven L. Schwarcz, *Regulating Complexity in Financial Markets*, 87 WASH. U. L. REV. 211, 215 (2009). Such amplification is particularly likely to occur when there is a long chain of institutions involved in the creation and sale of a product, such as often occurs in securitization transactions. As Shin established, each link in the securitization chain must use increasingly cheaper funding to make the transaction viable, and funding generally becomes cheaper when it is short-term (because of the lowered – but not eliminated – chance that something can go wrong in the brief period of exposure). Hyun Song Shin, *Macroprudential Policies Beyond Basel III*, 8 (Nov. 22, 2010) (available at <https://www.princeton.edu/~hsshin/www/MacroprudentialMemo.pdf>). Chains of institutions involved in the generation of a complex financial product thus entail increased reliance on short-term funding – but such reliance is problematic in that the continued availability of short-term funding is subject to runs.

¹⁵ Schwarcz, *supra* Note 14 at 215.

¹⁶ Manuel A. Utset, *Complex Financial Institutions and Systemic Risk*, 45 GA. L. REV. 779, 802 (2011).

¹⁷ Hilary J. Allen, *A New Philosophy for Financial Stability Regulation*, 45 LOY. U. CHI. L.J. 173, 218 (2013).

¹⁸ See Raghuram G. Rajan, *Has Financial Development Made the World Riskier?*, in FEDERAL RESERVE BANK OF KANSAS CITY SYMPOSIUM: THE GREENSPAN ERA: LESSONS FOR THE FUTURE 313, 343 (2005); Nicola Gennaioli, Andrei Shleifer & Robert Vishny, *Financial Innovation and Financial Fragility*, in FONDAZIONE ENI

reliance on the same shortcuts is therefore likely to correlate the behavior of actors in the financial system in the event of a crisis – the more complex the system, the more likely we are to see the panicked herd behavior (particularly destructive fire sales of financial assets) that precipitates financial instability.¹⁹

Complexity also exacerbates the “too big to fail” problem.²⁰ Increased interconnection increases the likelihood that one institution’s failure will impact the liquidity and solvency of another institution, but it hinders the ability of regulators to follow the pathways of contagion and determine the exact consequences of such failure.²¹ A lack of clarity about the exposures of a large, interconnected financial institution therefore makes it much more likely that it will be bailed-out in a time of panic, incentivizing such institution to take larger risks than it might otherwise take in the absence of an implied government safety net.²² It may be rational, then, for large financial institutions to purposely generate more complexity in the financial system, in order to entrench their status as “too big to fail”. Financial industry participants may also aggressively structure the financial products they issue to be as complex as possible, so as to insulate those products from scrutiny (both from regulators and market participants). Although Hu has recommended that some of these issues could be addressed by “disintermediating” the provision of information to regulators and market participants,²³ market participants in particular are limited in their ability and willingness to review voluminous and complex information at the best of times,²⁴ let alone during a full-blown panic. Disclosure regimes are therefore limited in their ability to address the opacity created by complexity.²⁵

Disclosure-based approaches to dealing with new products are also limited in other ways. Such approaches do nothing to slow down the increasingly speedy transmission of shocks facilitated by the ever-accelerating number of linkages in the financial system, or to address the rigidity introduced into the system by complex financial products. They do nothing to limit the development of products that introduce new and unregulated types of leverage into the system, making the system as a whole

ENRICO MATTEI NOTA DI Lavoro, No. 114.2010, 4 (May, 2010), *available at* <http://www.feem.it/userfiles/attach/20109211528484NDL2010-114.pdf>.

¹⁹ Allen, *supra* Note 17 at 219.

²⁰ Battiston et al., *supra* Note 10 at 2.

²¹ *Id.* at 18.

²² *Id.* at 16.

²³ Henry T.C. Hu, *Too Complex to Depict? Innovation, “Pure Information”, and the SEC Disclosure Paradigm*, 90 TEXAS L. REV. 1601 (2012).

²⁴ Min, *supra* Note 9 at ____.

²⁵ Judge, *supra* Note 12 at 712.

more fragile and susceptible to shocks.²⁶ Instead, disclosure regimes are focused on the parties to the product: any externalities generated by the product are at best secondary concerns. Thus, if we wish to promote financial stability, something more than a disclosure regime is needed.

III. A PRECAUTIONARY APPROACH TO COMPLEXITY

Once a complex financial product becomes established in the marketplace, regulators are unlikely to ban such product, even if it becomes problematic.²⁷ Instead, if regulators implement substantive regulation to address the failures of the product, they are more likely to do so incrementally as the flaws become apparent, adding regulatory complexity to an already complex product.²⁸ Attempting to meet the complexity of the financial system with even more complex regulatory rules incentivizes financial institutions to arbitrage those rules by creating *more* complex products that operate in the interstices of the regulation.²⁹ This vicious cycle is clearly suboptimal. In their illuminating presentation “The Dog and the Frisbee” Haldane and Madouros make the valuable point that “the more complex the environment, the greater the perils of complex control. The optimal response to a complex environment is often not a fully state-contingent rule. Rather, it is to simplify and streamline.”³⁰ Thus, rather than following the status quo approach to regulating complex financial products, this Essay argues for rules that seek to simplify the financial system.

A precautionary pre-approval review of financial products would occur prior to the introduction of such products into the system. If a product did not meet the initial requirements for approval, it would be banned, thus limiting the number of new products entering the financial system and mitigating a further spiral into complexity. The following Sections will explore the details of how such a pre-approval process would work but first, by way of background, this Section will explain what is meant by a precautionary approach to financial stability regulation. The form of the precautionary principle I have previously advocated for is what Sunstein has called the “stronger” form of the precautionary principle.³¹ Essentially, this means that “where activities can pose great harm, precautionary regulation should be employed that effectively shifts the burden of proof that the

²⁶ See, for example, Geanakoplos’ discussion of how the innovation of the credit default swap created a new and almost limitless source of leverage in the financial system. John Geanakoplos, *The Leverage Cycle*, in D. Acemoglu, K. Rogoff, and M. Woodford, eds., 24 *NBER Macroeconomics Annual 2009*, 1, 6 (2010).

²⁷ Kenneth C. Kettinger, *Securitization and its Discontents: The Dynamics of Financial Product Development*, 29 CARDOZO L. REV. 1553, 1650 (2007-2008).

²⁸ Allen, *supra* Note 17 at 186-187.

²⁹ *Id.*

³⁰ Haldane & Madouros, *supra* Note 11 at 4.

³¹ Cass R. Sunstein, *Irreversible and Catastrophic: Global Warming, Terrorism, and Other Problems*, 23 PACE ENVTL. L. REV. 3, 6 (2006)

activity should be permitted to the proponent of that activity, rather than the regulator having to make the case for why regulation is necessary.”³² With the stronger form of the precautionary principle, the burden that the proponent of a new financial product must meet is not insurmountable – regulators can still permit products that are likely to have some adverse consequences. And regulators can still prohibit products that have beneficial aspects, if they determine that – on balance – the negatives outweigh the positives. Importantly, the stronger-form precautionary principle does not permit regulators to ignore the costs of financial stability regulation. Instead, it dictates that regulators should proceed from an understanding that “maintaining a stable financial system is a benefit to society of great magnitude and that the fiscal and monetary remedies available after a crisis are costly, 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.”³³

A precautionary approach to evaluating complex financial products recognizes that there is no exact formula that can decide whether a product should be permitted or not³⁴ – it rejects quantified cost-benefit analysis as a standard for judging financial stability regulation.³⁵ This admittedly requires trusting regulatory experts in their evaluation of products, and these experts are not immune from mistakes.³⁶ The fear of such mistakes might raise concerns about moral hazard:³⁷ when a government authority approves a product, the product may seem to carry an authoritative seal of approval that disincentivizes users from investigating the product for themselves, notwithstanding that the government authority may have erred in approving it.³⁸ However, the degree to which moral hazard is an issue depends on the type of government approval granted. The regime proposed in this Essay is *not* a consumer or investor protection regime. There is therefore no implication that an approved product is suitable for any particular user – only that the perceived systemic risks posed by the product do not outweigh the contribution that the product is likely to make to economic growth.

³² Allen, *supra* Note 17 at 195.

³³ *Id.* at 196.

³⁴ *Id.* at 206; 212.

³⁵ See Note 87 and accompanying text for a discussion of “quantified cost-benefit analysis”.

³⁶ “Of course, simple rules are not costless. They place a heavy reliance on the judgement of the decision-maker”. Haldane & Madouros, *supra* Note 11 at 6.

³⁷ Moral hazard is the tendency of a guarantee, or something similar, to lessen a person’s incentives to act prudently. See Tom Baker, *On the Genealogy of Moral Hazard*, 75 Tex. L. Rev. 237, 239; 270 (1996).

³⁸ In a similar vein, many raised concerns about investors being encouraged to rely too heavily on credit ratings of financial products, if such credit ratings were given by credit rating agencies that were part of an approved government panel. Securities and Exchange Commission, REPORT TO CONGRESS ON ASSIGNED RATINGS, 31-33 (Dec. 2012) (available at <https://www.sec.gov/news/studies/2012/assigned-credit-ratings-study.pdf>).

Because market participants do not usually concern themselves with systemic stability issues when they make their investment decisions,³⁹ there is little risk of this type of government approval influencing their decision process. Indeed, financial stability regulation is required precisely because the private sector lacks the incentives and resources to conduct business in a way that is calculated to preserve financial stability.⁴⁰ As such, notwithstanding that regulators may make mistakes, the threats that financial innovation pose to financial stability should not remain unaddressed by regulation.⁴¹

IV. PRE-APPROVAL REGIMES FOR COMPLEX FINANCIAL PRODUCTS

“Innovation” is a term that has broadly positive connotations,⁴² but not all financial innovation is beneficial. Many complex financial products seem to have been generated by large financial institutions in order to maximize profits on the supply side, or to arbitrage regulatory requirements, rather than in response to any real investor demand or market need.⁴³ In this sense, much financial innovation can be conceived of as “sustaining innovation”, being innovation that is “faster than [incumbents’] customers’ needs evolve, [so incumbents] eventually end up producing products or services that are actually too sophisticated, too expensive, and too complicated for many customers in the market.”⁴⁴ Even products that seem to respond to genuine market needs may be problematic: to satisfy demand for higher return but seemingly lower-risk products, complex financial products are often engineered to concentrate the risk in the tail – meaning that the risk is low probability but high-consequence,⁴⁵ and as a result often underpriced.⁴⁶ Such innovations “are in fact designed to concentrate risk with investors who do not truly appreciate the risk that they are taking on”,⁴⁷ rather than meeting the need they were purportedly created to serve. Furthermore, as Turner has noted, at a certain point there must be “diminishing marginal returns” to providing ever more bespoke ways to

³⁹ Financial stability is a common good that is prone to free-riding, and so financial institutions have little incentive to structure their dealings so as to maintain that stability for the benefit of society as a whole (even though everyone ultimately benefits from financial stability in the long run). Allen, *supra* Note 17 at 184.

⁴⁰ *Id.*

⁴¹ *Id.* at 206.

⁴² Adair Turner, Lecture at CASS Business School: What Do Banks Do, What Should They Do and What Public Policies Are Needed to Ensure Best Results for the Real Economy? 7 (Mar. 17, 2010), available at http://www.fsa.gov.uk/pubs/speeches/at_17mar10.pdf.

⁴³ Dan Awrey, *Complexity, Innovation, and the Regulation of Modern Financial Markets*, 2 HARV. BUS. L. REV. 235, 262 (2012).

⁴⁴ Clayton Christensen, *Disruptive Innovation* (available at <http://www.claytonchristensen.com/key-concepts/>)

⁴⁵ Rajan, *supra* Note 18 at 316.

⁴⁶ Gennaioli et al., *supra* Note 18 at 2.

⁴⁷ Allen, *supra* Note 17 at 216-217.

intermediate capital or manage risk.⁴⁸ Given the threat that increasing complexity poses to financial stability, it makes sense to implement a pre-approval process for financial products that prevents innovations from being sold if they make no more than marginal improvements to the efficient functioning of the financial system.

Discussions of pre-approval regimes for financial products are often likened to “an FDA for financial products”.⁴⁹ Such analogies are not entirely apt, however, because it is not really feasible to conduct clinical trials of financial products in the same way that the FDA tests pharmaceuticals.⁵⁰ Instead, the most prominent proposals for pre-approval of complex financial products are the models promulgated by Saule Omarova, and by Eric Posner & E. Glen Weyl,⁵¹ and both models require judgment calls by the regulators involved. Posner & Weyl have proposed an agency to review financial products, which agency would only approve a product if deemed socially utile – otherwise, the product would be banned.⁵² Pursuant to Posner & Weyl’s model, determinations of utility would be based primarily on the criterion of whether the innovation is intended for socially useful “insuring” purposes, or for “gambling” purposes (with innovations that primarily facilitate gambling deemed *per se* inutile).⁵³ However, as Posner & Weyl readily concede, their model largely ignores any systemic risks posed by the innovation.⁵⁴ for example, their agency would approve an innovation that facilitates the insurance of risk, without considering whether that innovation could create interconnections in the financial system that speed up the transmission of shocks and thus endanger financial stability.

Post-Crisis, there is a general recognition that financial stability is a vitally important goal of financial regulation⁵⁵ – this Essay therefore asserts that any pre-approval regime for financial products should focus squarely on systemic risks that might imperil such financial stability. Omarova’s proposal is much more squarely aligned with a focus on financial stability. It argues for the creation of a Financial Product Approval Commission (“FPAC”),⁵⁶ which should use a tripartite test when evaluating a new

⁴⁸ Turner, *supra* Note 42 at 22.

⁴⁹ Posner & Weyl, *supra* Note 5 at 1348. See also Daniel Carpenter and Patricia McCoy, *Keeping Tabs on Financial Innovation: Product Identifiers in Consumer Financial Regulation*, 18 N.C. Banking Inst. 195, 206-208 (2013).

⁵⁰ “For clinical trials to be effective, they would have to be conducted over the entire business cycle, resulting in protracted delays.” Carpenter & McCoy, *supra* Note 49 at 197.

⁵¹ Posner & Weyl, *supra* Note 5; Omarova, *supra* Note 6.

⁵² Posner & Weyl, *supra* Note 5 at 1309.

⁵³ *Id.* at 1308. In their article “insuring” is used as a synonym for hedging, and “gambling” is used as a synonym for speculative activity. *Id.*

⁵⁴ *Id.* at 1312.

⁵⁵ Hilary J. Allen, *What is “Financial Stability?”: The Need for Some Common Language in International Financial Regulation*, 45 GEO. J. INT’L L. 929, 930 (2014).

⁵⁶ Omarova, *supra* Note 6 at 129.

financial product. The FPAC should consider: (i) the economic purpose of the product; (ii) the institutional capacity of the counterparties dealing in the product; and (iii) the likely systemic effects of the product.⁵⁷ “The applicant entity would bear the burden of showing that the proposed product meets all of the statutory and regulatory criteria for approval.”⁵⁸

Omarova’s first “economic purpose” test bears some similarities to Posner & Weyl’s social utility standard, in that it raises doubts about approving products that are designed to be used primarily for speculation.⁵⁹ However, Omarova’s first test is broader than Posner & Weyl’s, in that it also considers more globally whether the product satisfies a genuine market need (or if it is just driven by profit motivations on the supply side, or designed purely to arbitrage existing regulations).⁶⁰ Omarova’s second test is one of institutional capacity: “[d]o we want this particular institution to trade and deal in this particular product?”,⁶¹ based on that institution’s “ability to incur leverage, its business and risk profile, its internal compliance and management structures, and any history of enforcement actions.”⁶² In making an initial determination about whether a new product should be permitted to enter the financial system, the regulator could dispense with this institutional capacity test (although questions of institutional capacity would certainly be relevant to the ongoing monitoring of approved products once they have entered the financial system).⁶³ Products that do not meet both Omarova’s economic purpose test, and her systemic effects test discussed below, would be banned for *all* financial institutions.

From this Essay’s perspective, the most important, and challenging, of Omarova’s tests is the third “systemic effects” test. This provides that products should not be approved if they pose “potentially unacceptable systemic risk or [are] otherwise likely to increase the vulnerability of the financial system.”⁶⁴ In prior work, I have developed a conceptual framework for regulators to use when evaluating the systemic risks posed by a new financial product.⁶⁵ The starting point is that because financial innovation increases complexity, new products are presumptively

⁵⁷ *Id.* at 67.

⁵⁸ *Id.* at 131.

⁵⁹ *Id.* at 116.

⁶⁰ *Id.* at 116-117.

⁶¹ *Id.* at 121.

⁶² Allen, *supra* Note 17 at 211.

⁶³ “[E]ven if the proposed financial product may have proven economic and social utility, as a general matter, it may not be appropriate for a particular financial institution that fails to prove its ability to understand, identify, measure, monitor, and manage potential risks the product poses to the institution’s own financial health, as well as to the financial well-being of the product’s users and overall market stability.” Omarova, *supra* Note 6 at 121.

⁶⁴ *Id.* at 122.

⁶⁵ Allen, *supra* Note 17 at 212-222.

problematic for financial stability.⁶⁶ Financial institutions can then seek to rebut this presumption by demonstrating that the capital intermediation and/or risk management benefits of the proposed innovation justify the threat to financial stability posed by the new product.⁶⁷ In doing so, the financial institution must demonstrate that the proposed innovation will generate growth for the broader economy, and not just for the financial sector.⁶⁸ When evaluating new financial products, regulators should consider, amongst other things: “(i) the extent to which the innovation increases complexity, (ii) the extent to which the innovation multiplies the amount of risk in the system, (iii) the extent to which the innovation obscures the allocation of risk and capital in the financial system, and (iv) the extent to which the innovation channels capital to what are, on balance, non-productive investments (especially in real estate).”⁶⁹ Regulators should also consider whether the threats to stability posed by the innovation can be addressed using more traditional regulatory tools (like disclosure and capital regulation) – but regulators should always remain mindful that “concerns about increases in complexity can only really be dealt with by controlling the introduction of new innovations into the financial system.”⁷⁰

It is worth noting that, in addition to keeping problematic products out of the marketplace, a precautionary pre-approval regime for complex financial products can beneficially impact both regulators and the industry in a variety of ancillary ways. At present, regulators are hard-pressed to keep up with what the industry is doing. A pre-approval process would adjust this dynamic by requiring the industry to come to the regulators with information before introducing a new product line. This would force the industry to internalize some of the costs of testing their new products (for example, through stress tests) and providing their findings to the regulators.⁷¹ The burden shifting inherent in a pre-approval regime would therefore help alleviate the fiscal and informational constraints currently faced by regulators. Furthermore, the shifted burden would create more of an adversarial process between regulators and industry, potentially mitigating tendencies towards groupthink and capture, and galvanizing regulators’ identity as protectors of long-term financial stability.⁷² In terms of impacting industry behavior, a pre-approval process may cause financial institutions to abandon of their own accord innovations that are unlikely to pass regulatory muster, or that would only be profitable if they could be rushed to market quickly.⁷³ The mere existence of a pre-approval regime

⁶⁶ *Id.* at 214.

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.* at 221.

⁷⁰ *Id.* at 222.

⁷¹ *Id.* at 222-223.

⁷² *Id.* at 200-202.

⁷³ *Id.* at 224.

may therefore be salutary if it causes financial institutions to abandon innovations that have little to recommend them other than their “newness”.

V. BARRIERS TO PRE-APPROVAL REGIMES

This Essay has canvassed numerous benefits associated with implementing a pre-approval regime for complex financial products. However, two types of barriers to such a regime immediately come to mind. The first is political: varying attitudes to precaution will likely impact how amenable policymakers are to such proposals. The other type of barrier is technical – in order to determine whether a product is “new” and thus requires approval, we need to understand the defining features of existing financial products and categorize them in a way that makes it clear where one product stops and another one begins. This is daunting – however, there are currently several technical projects afoot that may improve the feasibility of a precautionary pre-approval process. This Section will consider these political and technological barriers in more detail.

A. Political Barriers

Many jurisdictions have implemented consumer and investor protection schemes, which seek to ensure that unsophisticated parties acquiring financial products are not unfairly taken advantage of.⁷⁴ However, the pre-approval regime for complex financial products discussed in this Essay is not primarily concerned with the suitability of products for those who acquire them – instead, it is focused on preventing externalities from impacting those who have no connection at all with the products. As discussed in Section II, this type of approach is inherently precautionary – the ultimate aim is to prevent the broader harms that may flow to society if the tail risks inherent in complex financial products come to fruition. The political feasibility of such a regime is therefore likely to depend in part on national (or supranational) attitudes to precaution.

Given that most complex financial instruments are (at least currently) the product of innovation by financial institutions headquartered

⁷⁴ In the United States, the Securities Exchange Commission is mandated to protect investors (15 U.S.C. § 77b(b)), and the Consumer Financial Protection Bureau established in 2010 “regulates the offering and provision of consumer financial products or services under the Federal consumer financial laws.” Dodd-Frank § 1011(a). In Europe, the preamble to Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments (known as “MiFID II”) explains the purpose of the Directive as “strengthen[ing] the framework for the regulation of markets in financial instruments. . . in order to increase transparency, better protect investors, reinforce confidence, address unregulated areas, and ensure that supervisors are granted adequate powers to fulfill their tasks.”

in either the United States or the European Union,⁷⁵ this Essay will focus on how receptive these two jurisdictions are to precautionary regulation. Fortunately, there is a wealth of literature that compares the attitudes of the United States and Europe to precaution.⁷⁶ While this literature rarely considers financial regulation in particular, the insights that it gives regarding attitudes to precautionary approaches to environmental risks can inform our discussion. Although it can be dangerous to assume that precautionary attitudes are consistent across different subject matters (for example, in recent years, the United States has demonstrated itself to be very amenable to a precautionary approach to anti-terrorism and national defense measures),⁷⁷ it is uncontroversial to say that – at least at present – the United States is much more skeptical of precaution in the realm of environmental regulation than Europe is.⁷⁸

As I have previously argued, there are many parallels to be drawn between environmental regulation and financial stability regulation,⁷⁹ and this Essay builds on these previous arguments to assert that attitudes towards financial precaution are likely to mirror those towards environmental precaution. Both financial and environmental regulators are dealing with highly complex systems where there is great uncertainty about the interactions of the elements within those systems.⁸⁰ As a result, such regulators have difficulty demonstrating that their regulation will succeed (or has already succeeded – how can you prove that a crisis didn't occur because of your precautionary efforts?) – but regulators must nonetheless exert their best efforts because systemic failure is catastrophic.⁸¹ The political dynamics of environmental regulation also parallel those confronted by financial stability regulation. In both instances, society has a large but diffuse interest in socially beneficial outcomes, while the regulated industry has a concentrated pecuniary interest in avoiding regulation, generating collective action problems.⁸²

It should not be surprising, then, that just as the EU “has become more risk-averse toward a broad range of health, safety, and environmental

⁷⁵ According to the European Banking Foundation, “Assets of EU and U.S. based banks amount to nearly 55% of world banking assets and both regions account for over 80% of global derivatives business.” European Banking Foundation, *Financial Regulatory Chapter and ISDS in TTIP*, 1 (Jan. 27, 2015) (available at http://www.ebf-fbe.eu/wp-content/uploads/2015/01/EBF_010590-EBF-position-paper-on-Financial-Regulatory-Chapter-and-ISDS-in-TTIP.pdf).

⁷⁶ For a survey of this literature, see Morag-Levine, *supra* Note 7.

⁷⁷ *Id.* at 1102-1103.

⁷⁸ *Id.*

⁷⁹ Allen, *supra* Note 17 at 192-195.

⁸⁰ *Id.*

⁸¹ *Id.* at 190.

⁸² *Id.* at 192-195.

risks”,⁸³ it seems to be more hospitable to ideas about preventing financial systemic risk through precautionary pre-approval regimes for financial instruments. For example, in its European Parliament platform, the German Social Democratic Party pledged to seek to put a product pre-approval process on the European agenda by linking it to the planned capital markets union.⁸⁴ Conversely, the United States has increasingly focused on “scientific proof of risk and on formal risk assessment”⁸⁵ before regulating environmental risks, and there is also a movement afoot to make precautionary financial regulation more difficult. While financial regulatory agencies have typically been given more leeway than environmental regulatory agencies in the United States⁸⁶ (in the sense that the latter, but not the former, are required to conduct a quantified cost-benefit analysis of their regulations),⁸⁷ there are moves to extend this quantified cost-benefit analysis standard to financial regulation. There have been repeated attempts to enact laws implementing such a requirement,⁸⁸ and though these attempts have not been successful to date, the D.C. Circuit has nonetheless handed down a string of decisions that strike down financial rulemakings because of the inadequacy of the economic analysis provided by the implementing agency.⁸⁹

The prospects for the implementation of a precautionary pre-approval process for complex financial products thus seem more sanguine in Europe than in the United States. However, the unilateral creation of a pre-approval process in Europe would (most probably) simply result in a

⁸³ David Vogel, *THE POLITICS OF PRECAUTION: REGULATING HEALTH, SAFETY AND ENVIRONMENTAL RISKS IN EUROPE AND THE UNITED STATES* (2012) at 19-20.

⁸⁴ Saule T. Omarova and Peter Simon, *Towards the Mandatory Approval of Complex Financial Instruments* (Sept. 22, 2014) (available at <http://www.socialeurope.eu/2014/09/complex-financial-instruments/>).

⁸⁵ Morag-Levine, *supra* Note 7 at 1106.

⁸⁶ “Many non-financial regulatory agencies are subject to the stringent cost-benefit analysis requirements set out in Executive Orders 12,866 and 13,563. Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993); Exec. Order No. 13,563, 76 Fed. Reg. 3,821 (Jan. 21, 2011). However, the independent regulatory agencies listed in 44 U.S.C. § 3502 (which include the Federal Reserve Bank (“FRB”), the Federal Deposit Insurance Corporation (“FDIC”), the Commodity Futures Trading Commission (“CFTC”), and the Securities and Exchange Commission (“SEC”)) are excluded from the ambit of Executive Order 12,866 by operation of section 3(b) of that Order.” Allen, *supra* Note 17 at 176.

⁸⁷ “[Q]uantified CBA in its ideal form – which some of its advocates refer to as “complete” quantified CBA – entails specification and quantification of all benefits and costs in a single, uniform bottom-line metric (typically, dollars) representing the net welfare effects of the proposed rule.” John C. Coates IV, *Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications*, 124 YALE L. J. 882, 893 (2015).

⁸⁸ These include S. 1173, 113th Cong. (2013); S. 3467, 112th Cong. (2012); S. 1615, 111th Cong. (2011). For a discussion of the deregulatory potential of such legislation, see Ben Protess, *Lawmakers Push to Increase White House Oversight of Financial Regulators*, N.Y. TIMES (Sept. 9, 2012). See also Coates, *supra* Note 87 at 924.

⁸⁹ Coates, *supra* Note 87 at 912-920.

migration of complex financial products to the United States.⁹⁰ Coordination between the European Union and the United States thus seems a prerequisite to any effective pre-approval process,⁹¹ and financial regulatory coordination is certainly being discussed as part of the negotiations on the Transatlantic Trade and Investment Partnership (“T-TIP”)⁹² between the United States and the European Union.⁹³ However, it is not yet clear if a concluded T-TIP would result in weaker or stronger financial stability regulation.⁹⁴ It may be that the T-TIP, rather than exporting European attitude towards precautionary regulation into US law, ends up ensuring that neither jurisdiction implements a precautionary pre-approval regime for complex financial products.

B. Technical Barriers

More concrete, but potentially more scalable, are the technical barriers to implementing a pre-approval regime for new financial products. The threshold questions for any such regime are “what is a financial product?” and “when does a financial product stop being one type of product and become a new one?”. While easy to pose, the answers to these questions are complicated, and unless they can be answered, then a pre-approval process will fail – no matter how conceptually sound the underlying logic of such a regime. Even less aggressive forms of financial

⁹⁰ For a discussion of concerns about stringent national regulation causing financial services businesses to change jurisdictions, see David Zaring, *Finding Legal Principle in Global Financial Regulation*, 52 VA. J. INT’L L. 683, 689 (2012).

⁹¹ Chris Brummer, *How International Financial Law Works (And How It Doesn’t)*, 99 GEO. L. J. 257, 268-269 (2011).

⁹² The T-TIP is a trade agreement intended to cover a wide range of goods and services, including financial services. For further detail, see Office of the United States Trade Representative, *U.S. Objectives, U.S. Benefits In the Transatlantic Trade and Investment Partnership: A Detailed View* (available at <https://ustr.gov/about-us/policy-offices/press-office/press-releases/2014/March/US-Objectives-US-Benefits-In-the-TTIP-a-Detailed-View>)

⁹³ In its negotiations, the US is seeking to “increase financial services market access to the EU as well as provide consumers with access to high-quality financial services and greater choice with regard to suppliers”, and also “to ensure that our government retains full discretion to regulate the financial sector and to take the actions necessary to ensure the stability and integrity of the U.S. financial system.” *Id.* The European Commission has stated as part of its objectives for the T-TIP that “the need to address regulatory barriers is particularly evident in the financial services sector.” European Commission, *EU - US TRANSATLANTIC TRADE AND INVESTMENT PARTNERSHIP (TTIP) Cooperation on financial services regulation*, 1 (Jan. 27, 2014) (available at http://trade.ec.europa.eu/doclib/docs/2014/january/tradoc_152101.pdf).

⁹⁴ Brummer has expressed concerns that, if some form of formal dispute resolution mechanism is implemented to allow an arbiter to rule on the appropriateness of a particular regulation in a particular jurisdiction, then that “would unjustifiably elevate financial market liberalization over prudential regulation.” Chris Brummer, *Written Testimony Before the European Parliament*, 3 (Mar. 18, 2104) (available at <http://www.europarl.europa.eu/document/activities/cont/201403/20140321ATT81504/20140321ATT81504EN.pdf>).

stability regulation – such as the monitoring of systemic risks mandated by Dodd-Frank⁹⁵ – will have limited efficacy without a clear understanding of the financial products available in the market.⁹⁶ This Part therefore explores potential avenues for creating a taxonomy of financial products that could facilitate a pre-approval regime for new and complex products, or at the very least improve systemic risk monitoring by providing clarity regarding the financial products that institutions are dealing in.

In the United States, there is no useful legal definition of “financial product”. There are various pieces of legislation (such as the definition of “security” in the Securities Act of 1933)⁹⁷ that give laundry lists of certain types of financial products, but there is no universal definition that encompasses *all* financial products. A more comprehensive list of “financial instruments” can be found in the EU’s MiFID,⁹⁸ but that directive lists only the financial products available at the time the directive was finalized. In other jurisdictions, a more functional approach has been taken – for example, Section 763A(1) of the Australian Corporations Act defines a financial product as “a facility through which, or through the acquisition of which, a person does one or more of the following: (a) makes a financial investment . . . (b) manages financial risk . . . (c) makes non-cash payments.” A broad functional definition like this can encompass an ever-evolving universe of financial products, and as such, is superior to a list-like definition that was fixed at the time the relevant legislation was passed.⁹⁹ However, a broad functional legal definition would give no guidance as to when something stops being one type of financial product and becomes another, nor does it give any assistance in determining if a financial product is “new”. Such distinctions are particularly vital if a pre-approval process is to regulate the introduction of new products into the financial system. Therefore, while *legislated* definitions of “financial products” should be broad and functional, regulators should maintain and update a much more detailed list of all the financial product types.¹⁰⁰

⁹⁵ Dodd-Frank § 112(a)(2)(C).

⁹⁶ Carpenter & McCoy, *supra* Note 49 at 198.

⁹⁷ 15 U.S.C. § 77b(a)(1)

⁹⁸ Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments (“MiFID”) Annex 1, Section C.

⁹⁹ It should be noted that even when lists are included in legislation, courts and regulators can interpret such lists to encompass new products on a case-by-case basis. See, for example *SEC v. Howey Co.* 328 U.S. 293 (1946) and its progeny (interpreting the boundaries of the subset of securities known as “investment contracts”).

¹⁰⁰ “By creating an evolving financial monitoring framework, regulatory agencies can bring these new instruments and institutions into view and, as necessary, under the regulatory umbrella.” Leonard Nakamura, *Durable Financial Regulations: Monitoring Financial Instruments as a Counterpart to Regulating Financial Institutions*, NBER WORKING PAPER 17006, 13 (May 2011).

In the United States, the Office of Financial Research (“OFR”) plans to create “a reference database for all financial instruments”.¹⁰¹ This database has yet to take shape, but the first step that must be taken is to decide how granular it should be in categorizing financial products. Any financial product is essentially a contract that sets out the rights and obligations of the parties thereto. It is possible then, to view each contract as an individualized transaction that is separate and distinct from every other transaction (even if the contract shares a large number of similarities with other contracts). There are certainly benefits to looking at financial products at a transactional-level of specificity – doing so would give regulators an unparalleled view of what is happening in the financial system, and the data generated thereby would be enormously helpful in monitoring the build up of systemic risks in the system. However, there are also benefits to categorizing products at a higher level of generality. A widely-used taxonomy of financial products would allow for comparison of products across firms: “[l]inking permanent identifiers to financial instrument characteristics will facilitate bottom-up analysis of portfolios and permit complex stress test simulations.”¹⁰² It would also “facilitate[] communication among users of the information, so that each party is confident that both parties are talking about the same thing.”¹⁰³ This Essay therefore argues for the development of a taxonomy that recognizes the key features of all existing financial products, which taxonomy can be updated to encompass new financial products as they are developed.

Henry Hu’s early work on the categorization of derivatives may be of some assistance in developing such a taxonomy. He suggests (while acknowledging 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.”¹⁰⁴ Partnerships with biologists and others specializing in complex adaptive systems could be enormously helpful in establishing a catalogue that extends beyond OTC derivatives to encompass all financial products. As a science, biology embraces a huge amount of ever-evolving complexity, and manages to accommodate this within non-static taxonomies that categorize all the various types of life. Although debates continue to rage in the biological community about the appropriate way to order a

¹⁰¹ Office of Financial Research, *Strategic Plan Fiscal Years 2015-2019*, 11 (available at <http://financialresearch.gov/strategy-budget/files/Office-of-Financial-Research-Strategic-Plan-2015-2019.pdf>).

¹⁰² Nakamura, *supra* Note 100 at 15.

¹⁰³ Dennis S. Karjala, *Distinguishing Patent and Copyright Subject Matter*, 35 CONN. L. REV. 439, 495 (2003).

¹⁰⁴ Henry T.C. Hu, *Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism*, 102 Yale L.J. 1457, 1506-1508 (1992-1993).

taxonomy of living organisms,¹⁰⁵ something akin to the Linnaean biological taxonomy will likely suffice for the (comparatively) much less complex financial system. Using a hierarchy of kingdom, phylum, class, order, family, genus and finally species, the Linnaean biological taxonomy elucidates both similarities and important differences between living organisms.¹⁰⁶ A similar exercise could be carried out for financial products.

Of course, this begs the question of which characteristics of a financial product are considered sufficiently defining and important that they should be used to distinguish one financial product from another. The UK's Financial Services Authority surveyed financial institutions and noted that those institutions' "criteria for classifying a structured product as 'new' differed amongst firms, but generally related to any significant variation to the product, such as changes in: counterparties, pay-off profiles, product shape, underlying index, and distribution channels."¹⁰⁷ These are axes to consider when developing the taxonomy. In an interview, Omarova mentioned some other axes to consider, including "terms related to payments and other material rights and obligations of the parties to the transaction, the nature of reference assets, the intended and actual uses of the product, the nature and systemic footprint of the counterparties and target markets, etc."¹⁰⁸

Agreement on the defining axes of financial products is vital, otherwise any use of the taxonomy will be plagued by arbitrage. Because most financial instruments can be characterized alternatively as either a new type of financial instrument or as the sum of existing financial instrument parts, unless the axes are clear, it will be difficult to demarcate the point at which a new use of an existing instrument becomes a *sui generis* new instrument. For example, if we were to imagine for a moment that credit default swaps ("CDS") did not yet exist, a financial institution seeking to introduce CDS into the marketplace might simply say that the CDS is just a new application (i.e. to credit instruments) of a non-exchange traded bilateral forward contract.¹⁰⁹ But a properly structured taxonomy would pick up the difference in reference asset (i.e. the underlying credit

¹⁰⁵ Patrick H. Zaepfel, *Legislating for Scientific Uncertainty: Preserving Administrative Flexibility to Interpret "Species" Under the Endangered Species Act*, 4 DICK. J. ENVTL. L. & POL'Y, 152, 160-163 (1995).

¹⁰⁶ Jim Chen, *Bioware: Cracking the Code*, 56 U. KAN. L. REV. 1029, 1030 (2008).

¹⁰⁷ Financial Services Authority, *Guidance Consultation: Retail Product Development and Governance – Structured Products Review*, 13 (Nov. 2011) (available at http://www.structuredretailproducts.com/product_files/4c/4ccd6e7ade08bd3a8d5250b8d54ac532a462636b).

¹⁰⁸ Saule T. Omarova and Peter Simon, *Towards the Mandatory Approval of Complex Financial Instruments* (Sept. 22, 2014) (available at <http://www.socialeurope.eu/2014/09/complex-financial-instruments/>).

¹⁰⁹ For a discussion of the building blocks of swap contracts, see Hu, *supra* Note 104 at 1467.

instrument), and use that difference to distinguish CDSs from existing forward contracts.

As a thought experiment, we can consider how a securitized product known as a “synthetic CDO squared” might be classified using a biological hierarchical taxonomy adapted for financial products. By way of background, “CDO” is an acronym for “collateralized debt obligation”. CDOs are a type of asset-backed securitization, meaning that an investor in the CDO will receive a bond or note that is issued by a special purpose vehicle (“SPV”)¹¹⁰ that owns a number of debt obligations, and the principal and interest obligations on such bond/note are serviced only by the revenues generated by the debt obligations owned by the SPV.¹¹¹ In this way, the revenue streams from the debt obligations are turned into securities that can be bought and sold in the capital markets (hence the term securitization). In the lead-up to the Financial Crisis, the debt obligations typically securitized using CDOs were themselves securitized cash flows from mortgages known as “mortgage-backed securities” or “MBSs”.¹¹² CDOs were thus more complex than MBSs, and synthetic CDO squareds (as explained more fully below) were more complex still.

The *kingdom* for a synthetic CDO squared might be “financial product”, the *phylum* a “security”. The *class* could be “bond” or “note” (depending on how the sponsor of the deal chooses to structure the securitization), and the *order* could be “asset-backed”. (Asset-backed bonds and notes would be distinguishable from other types of bonds and notes based on their structure, which involves using an SPV to ensure that the assets that back the bond/note are remote from bankruptcy, and that the proceeds of those assets are the only source of repayment to the holders for principal and interest on the bonds/notes).¹¹³ The *family* could reflect the type of assets being securitized – a CDO involves the securitization of debt instruments. Different CDOs could be broken down into *genus* – including CDOs that have been squared, or even cubed (a CDO squared involves the securitization of other CDOs, a CDO cubed involves the securitization of other CDO squareds).¹¹⁴ Finally, the *species* could reflect whether the transaction is synthetic or not. The non-synthetic versions would be backed by actual debt instruments or CDOs (as the case may be), while the synthetic versions would be backed by credit default swaps that have debt

¹¹⁰ An SPV (also sometimes referred to as a special purpose entity or “SPE”) is “formed for the purpose of the transaction and its operations are limited to those required in connection with the transaction . . . [it is] “bankruptcy remote,” in that it is created subject to an array of constraints designed to eliminate, to the extent possible, the risk that the [SPV] might in the future become subject to a proceeding under the Bankruptcy Code”. Kettering, *supra* Note 27 at 1564-65.

¹¹¹ *Id.* at 1556.

¹¹² Judge, *supra* Note 12 at 681.

¹¹³ Kettering, *supra* Note 27 at 1556.

¹¹⁴ Judge, *supra* Note 12 at 682.

instruments or CDOs (as the case may be) as reference obligations.¹¹⁵ There is then room for further differentiation at the subspecies level, if desired, based on the terms of the contracts being used. This type of exercise could be carried out for all existing financial products – while this would be a cost and time intensive exercise at the outset, once the taxonomy were established and the sunk costs expended, updating it as new products evolved would be much less costly.

A taxonomy like this would be a prerequisite for a pre-approval process for financial products. Once the standardized features of individual products have been identified and catalogued at an appropriate level of generality, regulators could identify products that should be banned for *all* financial institutions to issue or underwrite. (Our synthetic CDO squareds might be a good candidate for such a ban, given that they seem to make little improvement to capital intermediation, yet contribute significantly to the complexity of the financial system).¹¹⁶ After that initial review, if any market participant wanted to issue or underwrite a financial product that did not fit within the parameters of a product already set out in the taxonomy and approved for use, that market participant would need to approach the regulator to seek authorization to do so. Omarova has suggested that “[t]he consequences to a financial institution of failing to apply for a separate approval of a financial product, which is being used for a different purpose or by a different class of clients than originally disclosed to the regulators, would be severe: any transactions in such new, unapproved instruments are illegal.”¹¹⁷

There has already been some work done that can serve as a useful starting point for creating a taxonomy of financial products. The Enterprise Data Management Council is developing a Financial Industry Business Ontology or “FIBO™” that:

is a business conceptual ontology standard providing a description of the structure and contractual obligations of financial instruments, legal entities, market data and financial processes.

The primary application of the business conceptual ontology is for data harmonization and for the unambiguous sharing of meaning across data repositories. This common language (or Rosetta stone)

¹¹⁵ “Synthetic CDOs are backed by a pool of credit default swaps reference MBSs or other assets, rather than actual cash-producing assets.” *Id.*

¹¹⁶ “It is for instance arguable that the allocative efficiency benefits of the creation of markets for many complex structured products (e.g. CDO-squareds) would have been at most trivial even if they had not played a role in creating financial instability.” Financial Services Authority, THE TURNER REVIEW: A REGULATORY RESPONSE TO THE GLOBAL BANKING CRISIS, 41 (Mar. 2009)

¹¹⁷ Saule T. Omarova and Peter Simon, *Towards the Mandatory Approval of Complex Financial Instruments* (Sept. 22, 2014) (available at <http://www.socialeurope.eu/2014/09/complex-financial-instruments/>).

for the financial industry supports business process automation and facilitates risk analysis.

...

*It is being created as a collaborative effort among industry practitioners, semantic technology experts and information architects to standardize the language used to precisely define the terms, conditions, and characteristics of financial instruments; the legal and relationship structure of business entities; the content and time dimensions of market data; and the legal obligations associated with issuance, corporate actions, transactions and other financial processes.*¹¹⁸

While the FIBO™ project does not seem to group the instruments into any kind of hierarchical taxonomy (in the sense that it defines instruments individually, rather than as subsets of broader categories of products), its preliminary definitional work elucidating the key terms, conditions and characteristics of financial instruments would provide a significant head start for the creators of the type of taxonomy suggested by this Essay.

There are also pending technological innovations that might facilitate the creation of such taxonomy. Mark Flood and Oliver Goodenough of the Office of Financial Research recently published a paper exploring the potential for financial contracts to be represented as computer code that is machine-readable.¹¹⁹ “Code is a chain of logic, in which one action is logically defined along a specific path, to lead to another action”.¹²⁰ Flood and Goodenough have recognized that contracts are also chains of logic, that can be translated into code if we can identify the finite set of *states* of the relationship between the parties, and encode “explicit *transition* rules for shifting the relationship from one state to another, based on the realization of certain predefined *events*.”¹²¹ Flood and Goodenough have already restated a simplified financial contract in formal computational terms – the next step is to attempt to encode much more complex contracts in this way.

If technology advances quickly in this area, a starting point for the catalogue proposed in this Essay would be to collect standard form contracts

¹¹⁸ Enterprise Data Management Council, *Financial Industry Business Ontology* (available at <http://www.edmcouncil.org/financialbusiness>).

¹¹⁹ “By formalizing contracts according to rules of the literature on computability, we expose them to a wealth of powerful machinery from that domain, such as programmatic testing for legal completeness and computational complexity, and tools for simplification, visualization, and even the automated generation of legalese.” Mark D. Flood & Oliver R. Goodenough, *Contract as Automaton: The Computational Representation of Financial Agreements*, 3 (Mar. 26, 2015) (available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2538224).

¹²⁰ Joshua A.T. Fairfield, *Bitproperty*, 88 S. CAL. L. REV. 101, 148 (2015).

¹²¹ Flood & Goodenough, *supra* Note 119 at 3.

for complex financial products, and allow these to be sorted by a computer algorithm along the axes of identified key terms. While some of the form contracts used by financial institutions will not be publicly available, regulators often have the power to compel disclosure for financial stability purposes.¹²² Furthermore, many contracts for complex financial products are already somewhat standardized across the industry – the ISDA Master Agreement and its various annexes and confirmations (which are used for the overwhelming majority of swap contracts) being a prime example.¹²³ Regulators could use these form contracts to assist in classifying the various types of swaps. In addition to collecting contracts, regulators should also be able to compel other types of information from financial institutions (for example, information about the intended users for the product) to enable them to construct the taxonomy, and this information could be supplemented with information garnered from databases maintained by exchanges, clearinghouses and other areas of the government¹²⁴ (for example, the IRS is regularly required to distinguish between different financial products for taxation purposes¹²⁵ – its resources could therefore be helpful in constructing the taxonomy).

Finally, it is important to note the international dimensions of such a project. The financial system is global, the counterparties to complex financial instruments are often located in different jurisdictions, the operations of many large financial institutions straddle multiple countries, and it is very difficult to get a clear picture of which foreign subsidiaries are running what business.¹²⁶ Furthermore, regulators around the world cooperate in their monitoring of systemic risks and their regulation of financial stability.¹²⁷ As such, the catalogue proposed in this Essay would ideally be developed as an international project. The most obvious candidate to coordinate this project is the Financial Stability Board (“FSB”) – unlike other international financial standard-setters like the Bank for

¹²² For example, pursuant to Dodd-Frank § 112(d)(3), the Financial Stability Oversight Council, acting through the Office of Financial Research, may require reports from financial institutions (directly or through their primary regulators) for the purpose of assessing threats to financial stability.

¹²³ Gabriel V. Rauterberg & Andrew Verstein, *Assessing Transnational Private Regulation of the OTC Derivatives Market: ISDA, the BBA and the Future of Financial Reform*, 54 VA. J. INT’L L. 9, 13-14 (2013).

¹²⁴ Nakamura, *supra* Note 100 at 14.

¹²⁵ “Financial innovation poses a deep challenge for tax policy. The current United States tax system is based on a system of “tax cubbyholes,” a few idealized transactions for which the system specifies an exact tax treatment. Since any given new financial product is unlikely to fit squarely into a particular cubbyhole, the appropriate tax treatment for such products is often unclear.” Jeff Strnad, *Taxing New Financial Products: A Conceptual Framework*, 46 STAN. L. REV. 569, 570 (1994).

¹²⁶ See, for example, the discussion of Bank of America’s cross-border operations in Stephen J. Lubben, *Resolution, Orderly and Otherwise: BofA in OLA*, 81 U. CIN. L. REV. 485, 491-492 (2013).

¹²⁷ Hilary J. Allen, *What is “Financial Stability”? The Need for Some Common Language in International Financial Regulation*, 45 Geo. J. Int’l L. 929, 940 (2014).

International Settlements (“BIS”), the International Organization of Securities Commissioners (“IOSCO”) and the International Association of Insurance Supervisors (“IAIS”), the FSB’s focus is not restricted to one sector of the financial system. Instead, the FSB aims to promote the stability of the financial system as a whole¹²⁸ – and the creation of an internationally accepted taxonomy of financial products would certainly advance that goal.

VI. CONCLUSION

“As you do not fight fire with fire, you do not fight complexity with complexity”.¹²⁹ addressing complex financial products with even more complicated disclosure regimes is, in the end, a losing strategy for financial stability. Instead, regulation should seek to promote simplicity by limiting the number of complex financial products entering the system. This Essay has canvassed the proposals that have been advanced for pre-approval regimes for new financial products, and provided a realistic discussion of the political and technical barriers thereto. The political barriers may prove insurmountable (at least until there is a future crisis that prompts more precautionary regulation), but technological improvements in managing large amounts of data and automating financial contracts may allow us to conquer the technical barriers. At the very least, the catalogue of financial products proposed in this Essay is a goal worth pursuing, as it would ensure a greater level of consistency in the nomenclature used by different firms and regulators, and thus improve the efficacy of monitoring for financial stability.

¹²⁸ “The FSB promotes international financial stability; it does so by coordinating national financial authorities and international standard-setting bodies as they work toward developing strong regulatory, supervisory and other financial sector policies.” Financial Stability Board, *About the FSB* (available at <http://www.financialstabilityboard.org/about/>).

¹²⁹ Haldane & Madouros, *supra* Note 11 at 19.