

## REGULATING SHADOW BANKING\*

### *INAUGURAL ADDRESS FOR THE INAUGURAL SYMPOSIUM OF THE REVIEW OF BANKING & FINANCIAL LAW*

STEVEN L. SCHWARCZ\*\*

<i>I. Defining Shadow Banking</i> .....	620
A. The Scope of Shadow Banking.....	620
B. The Characteristics of Shadow Banking.....	623
<i>II. Assessing Shadow Banking</i> .....	626
A. Disintermediation.....	626
B. Decentralization .....	627
<i>III. Regulating Shadow Banking</i> .....	631
A. Regulation Focused on Maximizing Economic Efficiency .....	631
1. Information Failure.....	632
2. Rationality Failure .....	634
3. Principal-Agent Failure .....	635
4. Incentive Failure .....	636
B. Regulation Focused on Minimizing Systemic Risk.....	638
<i>IV. Conclusions</i> .....	641

In this Inaugural Address, I will (1) compare shadow and traditional banking, (2) examine shadow banking's efficiencies and risks, and (3) explore how shadow banking can be regulated to maximize those efficiencies and minimize those risks. To accomplish these regulatory goals, I believe we must go beyond the tools of traditional bank regulation and focus more functionally on regulating the firms and markets that comprise the shadow-banking network.

To do that, we first need to understand what shadow banking means.

## ***I. Defining Shadow Banking***

Irrespective of the definition one adopts, shadow banking is huge. Some estimate that it “rivals the traditional banking system in the intermediation of credit to households and businesses.”<sup>1</sup> Shadow banking also has grown rapidly: a Federal Reserve Bank Staff Report estimated the “gross size of [the industry was] nearly \$20 trillion in March 2008, which was significantly larger than the liabilities of the traditional banking system,”<sup>2</sup> while others estimated it at three times that level—\$60 trillion—in December 2011.<sup>3</sup> Without a clear understanding of the scope of shadow banking, however, these figures remain imprecise.

### **A. The Scope of Shadow Banking**

Economist and investment manager Paul McCulley, widely attributed as the term’s originator, used “shadow banking” to refer to “the whole alphabet soup of levered up non-bank investment conduits, vehicles, and structures.”<sup>4</sup> This roughly describes the world of structured finance, which creates and utilizes these types of conduits, vehicles and structures (collectively, “special purpose entities” or “SPEs”).<sup>5</sup>

---

\* © 2012 by Steven L. Schwarcz.

\*\* Stanley A. Star Professor of Law & Business, Duke University School of Law, and Founding Director, Duke Global Capital Markets Center; schwarcz@law.duke.edu. I thank Dan Awrey, Lawrence Baxter, and participants in the Boston University Review of Banking & Financial Law 2012 Inaugural Symposium for valuable comments and Shaun Barnes for invaluable research assistance.

<sup>1</sup> ZOLTAN POZSAR ET AL., FED. RESERVE BANK OF N.Y., STAFF REPORT NO.458, *Abstract to SHADOW BANKING* (2010).

<sup>2</sup> *Id.* at 4-5.

<sup>3</sup> See Philip Halstrick, *Tighter Bank Rules Give Fillip to Shadow Banks*, REUTERS (Dec. 20, 2011, 4:17 AM), <http://www.reuters.com/article/2011/12/20/uk-regulation-shadow-banking-idUSLNE7BJ00T20111220> (indicating that the shadow banking sector is a \$60 trillion industry).

<sup>4</sup> PAUL MCCULLEY, PIMCO, TETON REFLECTIONS: PIMCO GLOBAL CENTRAL BANK FOCUS 2 (2007), available at <http://media.pimco.com/Documents/GCB%20Focus%20Sept%202007%20WEB.pdf>.

<sup>5</sup> See generally STEVEN L. SCHWARCZ ET AL., SECURITIZATION, STRUCTURED FINANCE, AND CAPITAL MARKETS (2004). SPEs are sometimes referred to as special purpose vehicles or “SPVs.”

More recent commentators expand the meaning of “shadow banking.” Federal Reserve economists, for example, have used the term to refer to “financial intermediaries that conduct maturity, credit, and liquidity transformation without access to central bank liquidity or public sector credit guarantees.”<sup>6</sup> These intermediaries, they say, would include “finance companies, asset-backed commercial paper (‘ABCP’) conduits, limited-purpose finance companies, structured investment vehicles, credit hedge funds, money market mutual funds, securities lenders, and government-sponsored enterprises.”<sup>7</sup> Thus, in addition to SPEs, which this definition includes by enumerating ABCP conduits, limited-purpose finance companies and SIVs, this expansion of the term would include finance companies, such as Household Finance Corp.; hedge funds, such as BlackRock, Inc.; mutual funds, such as Fidelity Investments; GSEs, such as Fannie Mae and Freddie Mac; and many investment banks.

Even this broader definition of “shadow banking,” however, so far only includes entities. While that limited meaning might adequately define “shadow banks”, “shadow banking” presumably refers to what shadow banks do. That presumption, however, raises two questions.

The first question is whether “shadow banking” should refer to the provision by shadow banks of *any* financial products and services, or only to the provision by shadow banks of products and services ordinarily provided by traditional banks. Some adopt the latter, more limited meaning.<sup>8</sup> I adopt the broader meaning, however, because the essential element of shadow banking is that non-banks provide financial products and services. Moreover, the broader

---

<sup>6</sup> POZSAR ET AL., *supra* note 1, at 11 n.7.

<sup>7</sup> *Id.* at abstract.

<sup>8</sup> *See, e.g.*, Paul Tucker, Deputy Governor, Fin. Stability, Bank of Eng., Remarks at a BGC Partners Seminar: Shadow Banking, Financing Markets and Financial Stability 3 (Jan. 21, 2010) (transcript available at <http://www.bankofengland.co.uk/publications/speeches/2010/speech420.pdf>) (“I am not . . . using ‘shadow banking’ to refer to any old channel for credit intermediation other than bank lending. . . . Rather, I am interested this evening in those instruments, structures, firms or markets which, alone or in combination, and to a greater or lesser extent, replicate the core features of commercial banks: liquidity services, maturity mismatch and leverage.”)

meaning is flexible enough to encompass the inevitable evolution of financial products and services over time.<sup>9</sup>

The second question is a bit more metaphysical: should shadow banking—or, at least, the concept of a shadow-banking network—be limited to the provision of financial products and services by shadow banks, or should it also embrace the mediums used by shadow banks to provide those products and services? Shadow banks primarily provide those products and services through the financial markets.<sup>10</sup> The core of shadow banking, structured finance,<sup>11</sup> operates principally through these markets because securitization, the dominant method of structured finance,<sup>12</sup> depends critically on SPEs to issue securities that satisfy the demands of capital-market investors.<sup>13</sup> Repo lending, another well-known example of shadow banking, similarly operates through financial markets.<sup>14</sup>

For these reasons, my address will include financial markets in the shadow-banking network. I therefore define “shadow banking” to mean not only the provision of financial products and services by shadow banks, but also the financial markets used to provide those products and services. In that context, I recognize the potential for regulatory overlap when regulated banks actively participate in

---

<sup>9</sup> See *id.* at 3 (acknowledging that “we [will] confront new variants of shadow banking in the future”).

<sup>10</sup> Cf. Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 200 (2008) [hereinafter *Systemic Risk*] (observing that the ongoing trend towards disintermediation increases the importance of financial markets in any examination of systemic risk). Shadow banking facilitates disintermediation. See *infra* Part II.A (discussing disintermediation).

<sup>11</sup> See *supra* notes 4-5 and accompanying text.

<sup>12</sup> See, e.g., Henry A. Davis, *The Definition of Structured Finance: Results from a Survey*, 11 J. STRUCTURED FIN. 5, 7 (2005) (observing that “a large part of what is considered in today’s markets to be structured finance involves securitization”).

<sup>13</sup> That ability depends, in turn, far more on the structure of the transaction and the securities than on the nature of the SPE itself. There are several reasons for this. For example, bankruptcy remoteness—a key element of many securitization transactions, depends first on true sale and only secondarily on the SPE’s bankruptcy remoteness. Furthermore, the acceptability of the SPE’s securities to investors depends less on the nature of the SPE and more on such structural matters as overcollateralization and credit enhancement.

<sup>14</sup> Cf. *infra* notes 46-47 and accompanying text (discussing repo lending).

shadow financial markets—as is the case in the repo markets.<sup>15</sup> In the term “shadow banks,” I include, in accordance with the commentary,<sup>16</sup> not only SPEs but also finance companies, hedge funds, mutual funds, investment banks and GSEs.<sup>17</sup>

## B. The Characteristics of Shadow Banking

Any discussion of its characteristics must necessarily be tentative because we lack a concrete definition of shadow banking. Nonetheless, one can make several basic observations about the characteristics of shadow banking.

First, while traditional banks tend to be highly regulated, shadow banks tend to be less regulated. In discussing shadow banking, the media sometimes focuses on this characteristic.<sup>18</sup> The recent report of the Financial Crisis Inquiry Commission also emphasized this characteristic, referring to shadow banking’s “bank-like financial activities that are conducted outside the traditional commercial banking system, *many of which are unregulated or lightly regulated.*”<sup>19</sup>

---

<sup>15</sup> Cf. *id.* (observing that regulated banks are sometimes repo borrowers and lenders, even though the repo market is a well-known example of a shadow-banking market); *infra* note 104 (observing that shadow banking’s divergent components may require divergent regulatory responses).

<sup>16</sup> See *supra* notes 6-7 and accompanying text.

<sup>17</sup> See Bryan J. Noeth & Rajdeep Sengupta, *Is Shadow Banking Really Banking?*, REGIONAL ECONOMIST, Oct. 2011, at 8, 9 (“Shadow banking comprises a chain of intermediaries that are engaged in the transfer of funds channeled upstream in exchange for securities and loan documents that are moving downstream.”).

<sup>18</sup> See, e.g., Richard Cordray: *What His Appointment Means for the Consumer Financial Protection Bureau*, THE DIANE REHM SHOW (Jan. 9, 2012), <http://thedianerehmshow.org/shows/2012-01-09/richard-cordray-what-his-appointment-means-consumer-financial-protection-bureau> (discussing “financial companies that aren’t technically depository institutions, such as payday lenders or even mortgage companies,” and which lack federal oversight); Ben Protess, *Shadow Banking Makes a Comeback*, N.Y. TIMES DEALBOOK (May 27, 2011, 1:29 PM), <http://dealbook.nytimes.com/2011/05/27/> (follow “Shadow Banking Makes a Comeback” hyperlink) (explaining that the Dodd-Frank Act does not subject shadow banks to many of the regulations that the Act put into place).

<sup>19</sup> FIN. CRISIS INQUIRY COMM’N, PRELIMINARY STAFF REPORT: SHADOW BANKING AND THE FINANCIAL CRISIS 7 (2010), available at <http://fcic->

Second, the fact that shadow banks tend to be less regulated than traditional banks inevitably means that regulatory arbitrage drives the demand for shadow banking to some extent. Therefore, increasing bank regulation will almost certainly increase shadow-banking demand.<sup>20</sup> If driven exclusively by regulatory arbitrage, shadow banking may not represent a public good. For instance, regulatory arbitrageurs might use deal structures that carry higher transaction costs than the regulated alternative, but that offer a net gain to parties because they avoid regulation.<sup>21</sup> Regulatory arbitrage also disadvantages market participants that lack the wealth, expertise and, often, political connections to capitalize on arbitrage opportunities.<sup>22</sup>

Third, to the extent that shadow banking is not driven by regulatory arbitrage, it may well constitute a public good by helping to achieve efficiencies. That is, “[w]hile shadow banking activities certainly include activities which appear to have limited purpose other than regulatory capital arbitrage, it also includes a range of intermediation activities which appear to have significant economic value outside the traditional banking system.”<sup>23</sup> These activities notably include “disintermediation,” which, as I will later discuss, refers to the removal of the need for bank intermediation between the sources of funds (capital and other financial markets) and the users of

---

[static.law.stanford.edu/cdn\\_media/fcic-reports/2010-0505-Shadow-Banking.pdf](http://static.law.stanford.edu/cdn_media/fcic-reports/2010-0505-Shadow-Banking.pdf) (emphasis added).

<sup>20</sup> See, e.g., Halstrick, *supra* note 3 (observing that “[i]nternational regulators’ efforts to strengthen the financial system by tightening bank rules may inadvertently serve to boost opportunities for unregulated or ‘shadow’ financial players.”). For an interesting discussion of the political economy of regulatory arbitrage and deregulation, and the origin of shadow banking, see Erik F. Gerding, *The Shadow Banking System and Its Legal Origins* (Aug. 23, 2011) (unpublished manuscript), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1990816](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1990816).

<sup>21</sup> See Victor Fleischer, *Regulatory Arbitrage*, 89 TEX. L. REV. 227, 275 (2010) (“[W]hen new forms are chosen because they reduce regulatory costs and increase transaction costs compared to the old structure, we lose twice: efficiency is reduced by the increase in transaction costs, and the regulatory burden is shifted onto those who cannot engage in arbitrage.”); see also Frank Partnoy, *Financial Derivatives and the Costs of Regulatory Arbitrage*, 22 J. CORP. L. 211, 240-42 (1997) (describing a dynamic economic model of the efficiency of derivatives regulate\’n).

<sup>22</sup> Fleischer, *supra* note 21, at 280-82.

<sup>23</sup> POZSAR ET AL., *supra* note 1, at 5.

funds (e.g., corporations that operate in the real economy, such as AT&T or General Motors).<sup>24</sup> These activities also include decentralization of the provision of financial products and services, which can increase efficiency but can also increase risk.<sup>25</sup>

Finally, shadow banking can, if left unregulated, pose systemic risks to the financial system. Commentators argue, for example, that “[m]aturity and credit transformation in the shadow banking system . . . contributed significantly to asset bubbles in residential and commercial real estate markets prior to the [2008] financial crisis . . . .”<sup>26</sup> Moreover, to the extent shadow banking provides short-term funding of long-term capital needs, it creates a risk of liquidity discontinuities.<sup>27</sup> Although some may regard short-term funding as a central characteristic of shadow banking,<sup>28</sup> shadow banking can (and does) provide both short- and long-term funding.<sup>29</sup> Observers sometimes focus narrowly on short-term funding as a characteristic because of its potential for harm. In a larger perspective, however, short-term funding of long-term capital needs is a problem not of shadow banking *per se* but of the financial system.<sup>30</sup> Even traditional banks fund themselves through short-term deposits, with resulting liquidity discontinuities called “bank runs.”

Before assessing shadow banking’s efficiencies and risks, it is useful to consider what motivated the development of shadow banking. I believe the main catalyst was technology. To some extent, shadow banking delivers more diverse and, arguably, more innovative financial products than traditional banking. And while traditional banks have the capacity to respond, sooner or later, to investor demand for products, technology has enabled non-bank financial market participants, such as hedge funds, to compete with traditional banks in

---

<sup>24</sup> See *infra* Part II.A (discussing disintermediation).

<sup>25</sup> See *infra* Part II.B (discussing decentralization).

<sup>26</sup> POZSAR ET AL., *supra* note 1, at abstract.

<sup>27</sup> See *infra* notes 46-49 and accompanying text.

<sup>28</sup> This was a perception, for example, of some of the panelists at the symposium at which I presented this inaugural address.

<sup>29</sup> In securitization transactions, for example, the issued securities often have long-term maturities.

<sup>30</sup> Cf. Morgan Ricks, Visiting Assistant Professor, Harvard Law School, Presentation at the Review of Banking and Financial Law Symposium on Shadow Banking (Feb. 24, 2012) (notes on file with author) (arguing that the instability of short-term “money-like” securities is the central problem for financial regulatory policy).

providing these products quickly and at lower cost. Remarking on this competition, Donald Langevoort wrote

At the risk of gross oversimplification, the presence of such a high level of institutional demand for (especially) short-term debt instruments *plus the technological evolution in ways of structuring these products meant that the work traditionally done by the banking system gradually moved to Wall Street—* hence it became known as the “shadow banking system.”<sup>31</sup>

In addition, a contributing factor to the emergence of shadow banking has been regulatory arbitrage. Highly regulated banks could not provide financial products and services as cheaply as could non- or lightly-regulated shadow banks.<sup>32</sup>

## **II. Assessing Shadow Banking**

Shadow banking, therefore, can potentially increase economic efficiency, but also increase risk. I first address disintermediation, the primary mechanism by which shadow banking increases efficiency. I then address the decentralization created by shadow banking, which increases both efficiency and risk.

### **A. Disintermediation**

Shadow banking’s disintermediation likely increases economic efficiency. Banks are intermediaries of funds: they borrow from depositors and capital market investors the funds that they subsequently lend.<sup>33</sup> As profit-making institutions, banks observe the

---

<sup>31</sup> Donald C. Langevoort, *Global Securities Regulation After the Financial Crisis*, 13 J. INT’L ECON. L. 799, 803 (2010) (emphasis added and citations omitted).

<sup>32</sup> See *id.* (observing that “[t]he intense safety and soundness regulation for banks, particularly capital adequacy rules, simply did not apply in the USA to financial products intermediated by securities firms”).

<sup>33</sup> See, e.g., CHRISTOPHER VINEY, FINANCIAL INSTITUTIONS, INSTRUMENTS AND MARKETS 54–55 (5th ed., 2007). Although commercial banks borrow some of their funds from depositors, they also borrow a significant portion of their funding from the capital markets. See *id.* at 54 (noting that



fundamental maxim of “buy-low, sell high,” with the price of “buying” funds being the interest rates at which banks borrow and the price of “selling” funds being the marked-up interest rates at which they make loans. Essentially, borrowing from a bank, therefore, is like “buying retail.”<sup>34</sup> Disintermediation through shadow banking, however, can enable companies to borrow without paying that markup. In securitization transactions, for example, companies accomplish this by borrowing through SPEs.<sup>35</sup>

Shadow-banking transactions in which non-SPE, profit-making entities – such as investment banks, finance companies and hedge funds – intermediate in the place of banks usually produce fewer efficiencies. Nonetheless, because operating in the non-bank context likely results in lower regulatory costs than in the traditional bank context, non-bank intermediation can achieve efficiencies, so long as regulatory arbitrage problems are adequately addressed.

## **B. Decentralization**

By decentralizing lending, however, shadow banking can have both positive and negative consequences. Decentralization can increase consumer welfare by expanding the variety of funds and financial products available to individual investors, allowing them to tailor portfolios to their own preferences.<sup>36</sup> A decentralized financial

---

commercial banks “are no longer dependent on their deposit base for lending” because they can typically borrow sufficient funds from domestic and international capital markets to meet their forecast loan demands).

<sup>34</sup> Steven L. Schwarcz, *Securitization and Structured Finance*, in *ENCYCLOPEDIA OF FINANCIAL GLOBALIZATION* (forthcoming 2012) (manuscript at 4) (on file with author).

<sup>35</sup> SPEs do not ordinarily charge a profit. *See, e.g.*, Committee on Bankruptcy and Corporate Reorganization of the Association of the Bar of the City of New York, *New Developments in Structured Finance*, 56 *BUS. LAW.* 95, 132 (2000) (observing that SPEs are not intended to profit); Gary B. Gorton & Nicholas S. Souleles, *Special Purpose Vehicles and Securitization* 1 (Fed. Reserve Bank of Phila., Working Paper No. 05-21, 2005), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=713782](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=713782) (observing that SPEs “have no purpose other than the transaction(s) for which they were created”).

<sup>36</sup> *See* Franklin Allen & Douglas Gale, *A Welfare Comparison of Intermediaries and Financial Markets in Germany and the U.S.*, 39 *EUR. ECON. REV.* 179, 189 (1994) (comparing the decentralized U.S. financial system to Germany’s bank-dominated financial system).

system also may be more robust in the face of negative shocks.<sup>37</sup> If losses were distributed among many small financial institutions, some firms would be able to fail without threatening market stability.<sup>38</sup> In addition to helping reduce the size of firms, decentralization can also mitigate the “too big to fail” problem.

Decentralization, however, also can increase risk. For example, market failures may occur more frequently in shadow banking than in the traditional banking system, increasing systemic risk because uncorrected market failures can lead to inefficiencies in the allocation of capital within the financial system and can contribute to systemic failures.<sup>39</sup> Moreover, as I explain below, shadow banking might increase the likelihood that systemic risk will be triggered. And although it is less clear, shadow banking also may facilitate the transmission of systemic risk.

Shadow banking might increase the likelihood that systemic risk will be triggered by making panics, which often serve as the trigger that commences a chain of systemic failures,<sup>40</sup> more likely. Thus, Professor Dan Awrey argues that, implicitly due to decentralization, shadow banking creates market fragmentation, interconnectedness and opacity,<sup>41</sup> which make it difficult for market

---

<sup>37</sup> Cf. Halstrick, *supra* note 3 (observing that “shadow banks may now play the role of white knights for lenders trying to offload risky assets to comply with European regulatory capital targets by the middle of 2012”).

<sup>38</sup> For instance, the FDIC managed the vast majority of the more than 400 bank failures since 2008 without generating negative feedback effects in the financial system. See *Complete Failed Bank List*, FED. DEPOSIT INS. CORP. (Mar. 27, 2012), <http://www.fdic.gov/bank/individual/failed/banklist.html>.

<sup>39</sup> In Steven L. Schwarcz, *Controlling Financial Chaos: The Power and Limits of Law*, 2012 WIS. L. REV. (forthcoming 2012) (manuscript at 4-12), available at [http://scholarship.law.duke.edu/faculty\\_scholarship/2510/](http://scholarship.law.duke.edu/faculty_scholarship/2510/), I argue that four types of market failures are inherent in the financial system overall and show how these market failures can contribute to systemic failures. For example, information failure, principal-agent failure and incentive failure could, individually or in combination, cause one or more large firms to overinvest, leading to bankruptcy. *Id.* (manuscript at 4-8, 9-12). Rationality failure could cause prices of securities in a large financial market to collapse. *Id.* (manuscript at 8-9).

<sup>40</sup> See *Systemic Risk*, *supra* note 10, at 199-201 (“The classic example of systemic risk in this context is a “bank run,” in which the inability of a bank to satisfy withdrawal-demands causes its failure, in turn causing other banks or their creditors to fail.”).

<sup>41</sup> Dan Awrey, *Complexity, Innovation and the Regulation of Modern Financial Markets* 15 (Univ. of Oxford Legal Research Paper Series,

participants to effectively process information.<sup>42</sup> This allows risks to accumulate unnoticed and unchecked.<sup>43</sup> Market participants panic when hidden risks suddenly become apparent.<sup>44</sup>

Gary Gorton and Andrew Metrick also argue, although for different reasons, that shadow banking might increase the likelihood that systemic risk will be triggered.<sup>45</sup> They contend that certain short-term shadow-banking activities, such as repo lending, can create the shadow-banking equivalent of bank runs.<sup>46</sup> In the recent financial crisis, for example, the precipitous decline in the value of mortgage-backed securities used as collateral for short-term repo loans

---

Research Paper No. 49/2011, 2011), *available at* [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1916649](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1916649) (arguing that these factors make shadow banking especially prone to endogenous shocks); *see generally* Jon Danielsson et al., *Endogenous and Systemic Risk*, in *QUANTIFYING SYSTEMIC RISK* (forthcoming 2013), *available at* <http://www.riskresearch.org/files/JD-HS-JZ-37.pdf>.

<sup>42</sup> *See* Awrey, *supra* note 41, at 9-10 (defining complexity as a function of information costs and bounded rationality).

<sup>43</sup> *Cf. id.* at 12-13 (describing an actor's tolerance for complexities presented in shadow banking as a function of several variables inherent in the shadow banking system). Awrey argues that these pathologies may lead to inefficient contracting among market participants, as well as to "fraud, misconduct and other opportunistic behavior" by financial institutions. *Id.* at 52.

<sup>44</sup> *See id.* at 27-30 (arguing that several characteristics of financial markets "generate significant information costs and set us on a collision course with our own bounded rationality"); Danielsson et al., *supra* note 41 (manuscript at 4-6) ("[T]he distinguishing feature of crisis episodes is that they seem to gather momentum from the endogenous responses of the market participants themselves.").

<sup>45</sup> Gary Gorton & Andrew Metrick, *Regulating the Shadow Banking System* 1 (Oct. 18, 2010) (unpublished manuscript) [hereinafter *Shadow Banking*], *available at* <http://ssrn.com/abstract=1676947>. The above observations of Professors Gorton and Metrick should be placed into perspective, however. Shadow banking also provides significant long-term funding, which does not have the impact they describe. *Supra* note 29-30 and accompanying text. Moreover, short-term funding of long-term capital needs is a larger problem of the financial system. *Supra* note 30 and accompanying text.

<sup>46</sup> *See Shadow Banking*, *supra* note 45, at 1 ("When this quiet period finally ended in 2007, the ensuing panic did not begin in the traditional system of banks and depositors, but instead was centered in a new "shadow" banking system.").

prompted repo lenders to demand additional collateral.<sup>47</sup> Gorton and Metrick maintain that these demands approximated bank runs—in which panicked depositors withdraw funds from their banks—to the extent bank repo-borrowers were forced to sell assets to generate the additional collateral.<sup>48</sup> These forced asset sales also further depressed asset prices, creating a shock that spread rapidly through the interconnected financial system, impacting shadow-banking entities (like SIVs and money-market mutual funds) that relied on short-term debt.<sup>49</sup>

The net impact of shadow banking on the transmission of systemic risk is less clear than its impact on triggering systemic risk. It probably is not feasible to identify all systemic risk transmission mechanisms in advance. Consider, however, Professor Iman Anabtawi and my description of the impact of shadow banking on at least one such mechanism.<sup>50</sup> We argue that two otherwise independent correlations can combine to transform localized economic shocks into broader systemic crises. The first is an intra-firm correlation between a firm's financial integrity and its exposure to risk from low-probability adverse events that either constitute or could lead to economic shocks. The second, which is more relevant to shadow banking, is a system-wide correlation among financial firms and markets.

Because it uses financial markets to provide products and services and also increases interconnectedness, shadow banking might increase the system-wide correlation among financial firms and markets.<sup>51</sup> To that extent, shadow banking could increase

---

<sup>47</sup> *Id.* at 15; see also Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo* 23 (Int'l Ctr. for Fin. at Yale Sch. Of Mgmt., Working Paper No. 09-14, 2010) [hereinafter *Securitized Banking*], available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1440752](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1440752) (arguing that these demands were caused primarily by opacity about the exposure of different borrowers to the flagging real estate market and the value of borrowers' collateral in the event of defaults).

<sup>48</sup> *Shadow Banking*, *supra* note 45, at 15.

<sup>49</sup> *Id.* at 15-16; see also Steven L. Schwarcz *Regulating Complexity in Financial Markets*, 87 WASH. U. L. REV. 211, 232-33 (2010) [hereinafter *Regulating Complexity in Financial Markets*] (discussing information uncertainty through the example of mark-to-market accounting and margin calls by broker-dealers).

<sup>50</sup> Iman Anabtawi & Steven L. Schwarcz, *Regulating Systemic Risk: Towards an Analytical Framework*, 86 NOTRE DAME L. REV. 1349 (2011).

<sup>51</sup> See *supra* note 10 and accompanying text (discussing that correlation).

systemic risk transmission.<sup>52</sup> On the other hand, by increasing the number of financial firms and diversifying their functions,<sup>53</sup> shadow banking might actually diminish the correlation among such firms, thereby reducing systemic risk. There is insufficient information to determine which effect will predominate.<sup>54</sup>

Thus, shadow banking operates as a double-edged sword by increasing both efficiencies and risks. I next examine how regulation can maximize those efficiencies and minimize those risks.

### **III. Regulating Shadow Banking**

Because of the potential to increase efficiency, regulation should not necessarily be focused on limiting shadow banking *per se*. Instead, regulation should be focused on maximizing efficiencies and minimizing shadow banking's potential to increase risk.<sup>55</sup>

#### **A. Regulation Focused on Maximizing Economic Efficiency**

Regulation can maximize economic efficiency by correcting “market” failures.<sup>56</sup> In our case, the “market” is the entire non-bank network – the financial firms (whether SPEs or profit-making entities) and markets in which they operate – that comprises shadow banking. At least four types of partly interrelated market failures can occur within that network: information failure, rationality failure,

---

<sup>52</sup> See Hyun Song Shin, *Financial Intermediation and the Post-Crisis Financial System* 9 (Bank For Int'l Settlements, Working Paper No. 304, 2010) available at <http://www.bis.org/publ/work304.pdf> (arguing that when financial intermediaries draw on a limited pool of external funds, expanding balance sheets inevitably leads institutions to transact with one-another, deepening interconnectedness).

<sup>53</sup> With shadow banking, financial firms are no longer primarily banks but also SPEs, finance companies, hedge funds, mutual funds, investment banks and GSEs. See POZSAR ET AL., *supra* note 1, at 4-5; see also *supra* text accompanying note 9.

<sup>54</sup> Cf. Danielsson, *supra* note 41 (manuscript at 2) (attempting to theorize which effect will predominate).

<sup>55</sup> For a critical discussion of the rationale of financial regulation generally, see EMILIOS AVGOULEAS, *GOVERNANCE OF GLOBAL FINANCIAL MARKETS: THE LAW, THE ECONOMICS, THE POLITICS* (2012).

<sup>56</sup> See *Regulating Complexity in Financial Markets*, *supra* note 49, at 262-64 (providing examples of where regulation can be effective).

principal-agent failure and incentive failure.<sup>57</sup> Although none of these failures is unique to shadow banking, all can be exacerbated by shadow banking's complexity.

### 1. Information Failure

The shadow-banking network is incredibly complex.<sup>58</sup> Complexity can undermine disclosure,<sup>59</sup> which has been the chief regulatory response to information failure.<sup>60</sup> Although the Dodd-Frank Act puts great stock in the idea of improving disclosure,<sup>61</sup> I fear its efficacy will be limited. Some parts of the shadow-banking network are so complex that even some experts view them as incomprehensible.<sup>62</sup>

One question, therefore, is whether regulation should attempt to simplify or standardize shadow banking to minimize its complexity. One of the goals of the Dodd-Frank Act, for example, is to standardize the portion of the shadow-banking network involving derivatives transactions.<sup>63</sup> But standardization can backfire.

---

<sup>57</sup> Schwarcz, *supra* note 39 (manuscript at 4-12) (arguing that these four types of market failures are inherent in the financial system overall).

<sup>58</sup> For a general discussion of information failure resulting from complexity, see *Regulating Complexity in Financial Markets*, *supra* note 49, at 238 ("Uncertainty can cause a variety of financial-market failures, most obviously impairing securities market disclosure.").

<sup>59</sup> See Steven L. Schwarcz, *Disclosure's Failure in the Subprime Mortgage Crisis*, 2008 UTAH L. REV. 1109, 1110 (2008) [hereinafter *Disclosure's Failure*] (discussing the failure of subprime mortgage disclosure due to the complexity of the market).

<sup>60</sup> See, e.g., Langevoort, *supra* note 31, at 803 (observing that "[r]egulation remained largely disclosure-oriented on the sell-side, even as the products increased in complexity"); Cynthia A. Williams, *The Securities and Exchange Commission and Corporate Social Transparency*, 112 HARV. L. REV. 1197 (1999) (discussing the general purpose of disclosure in the Securities Exchange Act of 1934 and the Securities Act of 1933).

<sup>61</sup> See, e.g., Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, § 1103, 124 Stat. 1376, 2118 (2010) [hereinafter *Dodd-Frank Act*] (to be codified at 12 U.S.C. § 225b) (requiring additional disclosure).

<sup>62</sup> See, e.g., David Barboza, *Complex El Paso Partnerships Puzzle Analysts*, N.Y. TIMES, July 23, 2002, at C1 (describing how "one industry giant, the El Paso Corporation, is growing ever more reliant on deals [that use SPEs] so complex that securities experts call them incomprehensible").

<sup>63</sup> Dodd-Frank Act § 723 (to be codified at 7 U.S.C. § 2) (requiring many

Standardizing derivatives transactions, for example, might inadvertently increase systemic risk by concentrating derivatives exposure at the clearinghouse level.<sup>64</sup> The overall economic impact of standardization is also unclear because standardization can stifle innovation and interfere with the ability of parties to achieve the efficiencies that arise when firms craft financial products tailored to the particular needs and risk preferences of investors.<sup>65</sup>

The Dodd-Frank Act also attempts to reduce information failure in the portion of the shadow-banking network involving securitization transactions.<sup>66</sup> Sellers of securitization products are required to retain a minimum unhedged position in each class of securities they sell, thereby ensuring sellers have so-called “skin in the game.”<sup>67</sup> This too can backfire. By retaining residual risk portions of certain complex securitization products they were selling, underwriters who did not fully understand those products may have fostered false investor confidence, contributing to the 2008 financial crisis.<sup>68</sup>

Therefore, in the shadow-banking network, some amount of information failure will be inevitable.

---

derivatives to be centrally cleared through clearinghouses).

<sup>64</sup> Anabtawi & Schwarcz, *supra* note 50, at 1395.

<sup>65</sup> *See id.* (“[S]tandardization would be disruptive to customized transactions that yield efficiencies in risk bearing.”)

<sup>66</sup> I use securitization and derivatives as examples throughout this Address, consistent with the Financial Crisis Inquiry Commission’s preliminary staff report. *See* FIN. CRISIS INQUIRY COMM’N, *supra* note 19, at 4 (referencing shadow banking’s dominance in the “markets for securitized products, structured products, commercial paper, asset-backed commercial paper, repurchase agreements, and derivatives.”).

<sup>67</sup> *See* Dodd-Frank Act § 941(b) (to be codified at 15 U.S.C. § 78o-11(c)(1)) (directing the Securities and Exchange Commission to require sponsors of asset-backed securities to retain at least five percent of the credit risk of the underlying assets). A recent Federal Reserve Bank staff report identifies this credit-risk retention as one of the most important “aspects of proposed [Dodd-Frank Act] rules in light of shadow banking.” TOBIAS ADRIAN, FED. RESERVE BANK OF N.Y., STAFF REPORT NO. 533, *Abstract to DODD-FRANK ONE YEAR ON: IMPLICATIONS FOR SHADOW BANKING* (2011).

<sup>68</sup> *See Regulating Complexity in Financial Markets*, *supra* note 49, at 241-42 (referring to this as a “mutual misinformation” problem).

## 2. Rationality Failure

Humans have bounded rationality.<sup>69</sup> Moreover, the more complex something is, the less certain we are about it and the harder it is to understand.<sup>70</sup> We then tend to focus on the simpler and more straightforward elements with which we are familiar.<sup>71</sup> We also tend to believe what we want to believe.<sup>72</sup>

This helps to explain why, in light of the complexity of shadow banking, market participants have sometimes acted without full understanding. For example, investors were prepared to believe, based on mathematical models that they did not fully understand, that the investment-grade rated securities issued in highly complex second-generation securitization transactions,<sup>73</sup> offering much higher returns than other similarly rated securities, represented good investments even though they were at least partly backed by

---

<sup>69</sup> See Awrey, *supra* note 41, at 9 n.24 (quoting OLIVER WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM 45 (1985)) (“Bounded rationality is a semi-strong form of rationality in which economic actors are assumed to be ‘intendedly rational, but only limitedly so’”).

<sup>70</sup> See *id.* at 13 (arguing that “our tolerance for complexity is not infinite”).

<sup>71</sup> See *id.* (conceptualizing a “complexity frontier” beyond which “actors will be forced to employ heuristics as a second-best means of understanding a particular set of facts or state of the world”).

<sup>72</sup> Cf. J. Barkley Rosser Jr., *Alternative Keynesian and Post Keynesian Perspectives on Uncertainty and Expectations*, 23 J. POST KEYNESIAN ECON. 545, 554–57 (2001) (arguing that uncertainty leads to self-fulfilling mistakes).

<sup>73</sup> These transactions included securitizations of collateralized-debt-obligation securities, or “ABS CDO” transactions. See, e.g., David Milliken & Richard Barley, *ABS CDOs, at heart of crisis, may disappear*, REUTERS (April 1, 2008, 1:37 PM), <http://uk.reuters.com/article/2008/04/01/bis-assetbackedsecurities-idUKL0161391420080401> (“The use of credit derivatives in fact allowed more exposure to be created than the amount of underlying bonds issued”); Joshua Coval et al., *The Economics of Structured Finance*, 23 J. ECON. PERSPECTIVES 3, 3 (2009) (finding that complex securitization transactions such as collateralized debt obligations (“CDO”s) amplified the errors in evaluating the risk of the underlying securities); David Reilly, *Center of a Storm: How CDOs Work*, WALL ST. J., June 23, 2007, at B1 (“CDOs have generated debate because they are complex, and pose a risk because they are several steps removed from the actual asset, or debt, that is being packaged”).



subprime mortgages. Furthermore, many of these mathematical models were, at best, only rough approximations.<sup>74</sup>

### 3. Principal-Agent Failure

Commentators widely acknowledge this type of principal-agent failure insofar as it involves conflicts of interest between managers and owners of firms. At least in the shadow-banking network, however, the more serious conflict occurs within the firm: secondary managers, such as investor analysts and investment-bank vice presidents, are almost always paid under short-term compensation schemes, misaligning their interests with the long-term interests of the firm.<sup>75</sup> Although this intra-firm principal-agent failure is not unique to shadow banking, the complexity of shadow banking, combined with the very technology that enables shadow banking to thrive,<sup>76</sup> can exacerbate the failure.<sup>77</sup>

---

<sup>74</sup> THOMAS S. Y. HO & SANG BIN LEE, THE OXFORD GUIDE TO FINANCIAL MODELING: APPLICATIONS FOR CAPITAL MARKETS, CORPORATE FINANCE, RISK MANAGEMENT, AND FINANCIAL INSTITUTIONS 348–49 (2004) (discussing Monte Carlo simulations, which condition prepayment risk upon hypothetical interest rate fluctuations); *see also* Advanced Analytics, Inc. v. Citigroup Global Markets., Inc., No. 04 Civ. 3531(LTS)(HBP), 2008 WL 2557421, at \*1 (S.D.N.Y. June 26, 2008) (describing as “complex” the computerized process used to estimate prepayment risk); *Regulating Complexity in Financial Markets*, *supra* note 49, at 217 (describing the complexity of financial models); Erik F. Gerding, *Code, Crash, and Open Source: The Outsourcing of Financial Regulation to Risk Models and the Global Financial Crisis*, 84 WASH. U. L. REV. 127, 170–71 (2009) (“These models, like any other financial or scientific models, make simplifying assumptions about market behavior in order to generate predictions in the face of complexity.”).

<sup>75</sup> *See* Steven L. Schwarcz, *Conflicts and Financial Collapse: The Problem of Secondary-Management Agency Costs*, 26 YALE J. ON REG. 457, 460 (2009) [hereinafter *Conflicts and Financial Collapse*] (“The conflict centers on compensation. Secondary managers are typically compensated for performing their assigned tasks, without regard for the long term consequences of the tasks to their firms.”).

<sup>76</sup> *See* Langevoort, *supra* note 31, at 803 (discussing how technology allowed traditional banking activities to move to Wall Street).

<sup>77</sup> *See Conflicts and Financial Collapse*, *supra* note 75, at 461–65 (stating that the increasing complexity of financial markets makes it more likely that there will be a conflict between secondary managers and their firm).

To prevent this principal-agent failure, firms could pay managers, including secondary managers, under longer-term compensation schemes, e.g., deferred compensation based on long-term results.<sup>78</sup> In practice, however, that solution must overcome a collective action problem: firms that offer their secondary managers longer-term compensation may not be able to hire as competitively as firms that offer more immediate compensation.<sup>79</sup> Regulation may be needed to solve this collective action problem not only within nations but also across nations, because good secondary managers can work in financial centers worldwide.

#### 4. Incentive Failure

I have observed that technology has enabled the shadow-banking network to produce more diverse and innovative financial products than traditional banking.<sup>80</sup> In securitization transactions, for example, these products often include securities that allocate the return to investors based on finely calibrated risk levels that are intended to meet specific investor risk appetites. This can be structured in various ways, such as through tranching, which allocates repayment to different classes of securities that have different repayment priorities; or through asset stripping, which allocates repayment to classes of securities from the specific cash flows of underlying financial assets (such as principal-only or interest-only securities). Advanced technology, including computerization, facilitates this by making it possible to track the allocated cash flows.

This enables investment risk to be finely dispersed, and, in theory, such investment diversification is beneficial. However, risk sometimes can be marginalized by becoming so widely dispersed that rational market participants individually lack the incentive to monitor it.<sup>81</sup> Under-monitoring caused by this incentive failure

---

<sup>78</sup> See, e.g., Kimberly D. Krawiec, *The Return of the Rogue*, 51 ARIZ. L. REV. 127, 158 n.145 (2009) (giving an example of one firm's attempt at deferred compensation).

<sup>79</sup> See, e.g., *id.* at 157-58 (arguing that financial institutions have had trouble balancing the discouragement of excessive risk-taking against the need to create profit-maximizing incentives and preferences).

<sup>80</sup> See *supra* notes 26-31 and accompanying text.

<sup>81</sup> See Steven L. Schwarcz, *Marginalizing Risk*, 89 WASH. U. L. REV. (forthcoming 2012) (manuscript at 1), available at <http://ssrn.com/>

appears to have contributed, at least in part, to the 2008 financial crisis.<sup>82</sup> The problem of incentive failure may be difficult to solve, however.<sup>83</sup>

In short, shadow banking can exacerbate market failures. Regulation can help to control, but cannot completely eliminate those failures.<sup>84</sup> On the other hand, shadow banking might provide a social good, notwithstanding its market failures, because it brings positive attributes to the financial system, such as disintermediation and

---

abstract=1721606 (“Risk can even be so widely dispersed that rational investors individually lack the incentive to monitor.”).

<sup>82</sup> See Jean-Claude Trichet, President, Eur. Cent. Bank, Speech before the Fifth ECB Central Banking Conference (Nov. 13, 2008) (transcript available at [http://www.ecb.int/press/key/date/2008/html/sp081113\\_1.en.html](http://www.ecb.int/press/key/date/2008/html/sp081113_1.en.html)) (arguing that “the root cause of the [financial] crisis was the overall and massive undervaluation of risk across markets, financial institutions and countries”); Joe Nocera, *Risk Mismanagement*, N.Y. TIMES (Jan. 2, 2009), [http://www.nytimes.com/2009/01/04/magazine/04risk-](http://www.nytimes.com/2009/01/04/magazine/04risk-t.html?pagewanted=all)

[t.html?pagewanted=all](http://www.nytimes.com/2009/01/04/magazine/04risk-t.html?pagewanted=all) (“All the incentives — profits, compensation, glory, even job security — went in the direction of taking on more and more risk, even if you half suspected it would end badly. After all, it would end badly for everyone else too.”).

<sup>83</sup> For example, regulation could require—perhaps for certain large issuances of complex securities—that a minimum unhedged position be held by a single sophisticated investor in each class of securities. *Marginalizing Risk*, *supra* note 81, at 21-26. Regulatory attempts to limit risk dispersion would have tradeoffs. Thus, the Dodd-Frank Act requires securitization sellers to keep “skin in the game” by retaining risk in the form of at least a five percent unhedged vertical slice of risk. Dodd-Frank Act, Pub. L. No. 111-203, § 941(b), 124 Stat. 1376, 1891 (2010) (to be codified at 15 U.S.C. § 78o-11(c)(1)). Problematically, such retention would only mitigate conflicts between the parties retaining and those taking on the risk, not between financial market participants and the non-financial market participants who bear the burden of externalized risk in a systemic collapse of the financial system. *Marginalizing Risk*, *supra* note 81, at 21-26; *cf.* Kevin Villani, *Risk-Retention Rules Set Up the Private Investor for Failure*, AM. BANKER (Aug. 29, 2011, 3:06 PM), <http://www.americanbanker.com/bankthink/QRM-qualifying-residential-mortgage-risk-retention-housing-private-investor-1041645-1.html> (arguing that lack of “skin in the game” was not responsible for financial institutions’ “astronomical leverage”).

<sup>84</sup> Although regulation cannot eliminate market failures completely, even within the broader financial system, Schwarcz, *supra* note 39 (manuscript at 28), there might be more market failures in shadow banking and they might be harder to control.

increased efficiency.<sup>85</sup> The net effect of balancing these failures and benefits is, at present, indeterminate.

### **B. Regulation Focused on Minimizing Systemic Risk**

I also have observed that regulation should be focused on minimizing shadow banking's potential to create systemic risk. Specifically, shadow banking might increase that potential by increasing the likelihood that systemic risk will be triggered and, although less clear, by increasing the transmission of systemic risk.

Shadow banking may increase the likelihood that systemic risk will be triggered by making panics more likely.<sup>86</sup> Targeted regulation probably is not feasible to reduce that likelihood because it is impossible to identify all the causes of panics.<sup>87</sup> Furthermore, except in the context of particular fact patterns,<sup>88</sup> it is difficult to see how regulation could directly reduce shadow banking's fragmentation, interconnectedness and opacity, which increase the potential for panic.<sup>89</sup>

Regulation could indirectly reduce fragmentation, interconnectedness and opacity, however, by limiting the factors that give rise to shadow banking. It would almost certainly be futile, if not counter-productive, to try to impose regulatory limits on technology, the first such factor.<sup>90</sup> Therefore, if there is a regulatory solution, it lies with limiting regulatory arbitrage, the other factor giving rise to shadow banking.<sup>91</sup>

Regulatory arbitrage could be limited either by regulating traditional banks less or by regulating shadow banks more.<sup>92</sup> At least currently, it does not appear to be politically feasible to regulate

---

<sup>85</sup> See *supra* Part II.

<sup>86</sup> See *supra* notes 40-41 and accompanying text.

<sup>87</sup> See *Systemic Risk*, *supra* note 10, at 211-13 (arguing "attempts to regulate systematic risk are imperfect and messy").

<sup>88</sup> See, e.g., *Shadow Banking*, *supra* note 45, at 1 (proposing repo-collateral requirements to reduce information problems).

<sup>89</sup> See *supra* notes 40-41 and accompanying text.

<sup>90</sup> See *supra* notes 26-32 and accompanying text.

<sup>91</sup> *Id.*

<sup>92</sup> Recall that shadow banks are SPEs, finance companies, hedge funds, mutual funds, investment banks and GSEs. *Supra* notes 16-17 and accompanying text.

traditional banks less.<sup>93</sup> If anything, the trend appears to be in the opposite direction.<sup>94</sup> On the other hand, there does appear to be sentiment toward regulating at least some shadow banks more. For example, the Dodd-Frank Act subjects non-bank financial firms that are designated as systemically significant to enhanced prudential regulation, including capital requirements, limits on leverage and short-term debt, liquidity requirements and increased regulatory disclosures.<sup>95</sup>

---

<sup>93</sup> Cf. Group of Twenty Finance Ministers and Central Bank Governors [G20], *Communiqué of the Finance Ministers and Central Bank Governors of the G-20*, at 2 (2011), available at <http://g20mexico.org/images/stories/canalfinan/docs/02comu.pdf> (resolving to “ensure that banks are adequately capitalized and have sufficient access to funding to deal with current risks.”).

<sup>94</sup> See Halstrick, *supra* note 3 (observing that the consequences of increased bank regulation will be a growth in shadow banking). Several observers believe that the Dodd-Frank Act may actually fuel the growth of shadow banking by increasing the regulatory burden on the traditional banking sector. See Eugene Ludwig, *Shadow Banking Will Flourish as Dodd-Frank Squeezes Banks*, AM. BANKER: BANK THINK (July 19, 2011, 5:22 PM), <http://www.americanbanker.com/bankthink/shadow-banking-system-Dodd-Frank-Ludwig-1040318-1.html> (“[T]he shadow banking sector has become more attractive due to the virtual lack of regulatory increase it has experienced . . . .”); Stephen Gandel, *Is Dodd-Frank Reviving the Shadow Banks?*, TIME (Jun. 27, 2011), <http://business.time.com/2011/06/27/is-dodd-frank-reviving-the-shadow-banks/> (“[I]t appears, shadow banks . . . seem to be making a come back.”); cf. Daniel K. Tarullo, Governor, Board of Governors of the Federal Reserve, Brookings Panel on Economic Activity: Comments on “Regulating the Shadow Banking System” (Sept. 17, 2010) (transcript available at <http://www.federalreserve.gov/newsevents/speech/tarullo20100917a.htm>) (“[M]ore will need to be done in this area, particularly as new constraints applicable to large regulated institutions push more activity into the unregulated sector.”).

<sup>95</sup> Dodd-Frank Act, Pub. L. No. 111-203, § 115(b), 124 Stat. 1376, 1403 (2010) (to be codified at 12 U.S.C. § 5325(b)) (providing a list of prudential requirements). The Group of Thirty also recommends that money-market mutual funds be forced to choose between becoming “special-purpose banks” subject to prudential regulation and government insurance (and having access to central bank liquidity), and investing only in stable, low-risk assets and abandoning guarantees to investors of being able to withdraw their funds “on demand at a stable” net asset value. GROUP OF THIRTY, FINANCIAL REFORM: A FRAMEWORK FOR STABILITY 29 (2009), available at [http://www.group30.org/images/PDF/Financial\\_Reform-A\\_Framework\\_for\\_Financial\\_Stability.pdf](http://www.group30.org/images/PDF/Financial_Reform-A_Framework_for_Financial_Stability.pdf). Gorton and Metrick adopt this proposal in their

Efforts to increase the regulation of shadow banks must grapple with the question of whether the regulation optimally minimizes the risk of systemic harm while preserving shadow banking's efficiency. Some have argued, for example, that leaving the regulation of systemically significant firms to the discretion of the Financial Stability Oversight Council<sup>96</sup> could create a "boundary problem" in determining which firms fall into the enhanced prudential regulatory regime, thereby creating new opportunities for regulatory arbitrage.<sup>97</sup> I have also queried in another context whether regulating systemically important firms, such as by limiting financial leverage, can reduce systemic risk at the cost of impairing efficiency.<sup>98</sup>

There may be an even more targeted regulatory approach that would reduce the systemic impact of shadow banking while preserving shadow banking's efficiency: protecting directly against systemic consequences that could result from shadow banking.<sup>99</sup> One way to do this would be to limit the transmission of systemic risk resulting from shadow banking. Chaos theory holds that in complex engineering systems – and, I have argued, also in complex financial systems – failures are almost inevitable.<sup>100</sup> Therefore, regulatory

---

own recommendations for regulating shadow banking. *Shadow Banking*, *supra* note 45, at 20. Net asset value, often abbreviated "NAV," is usually \$1.00. If a fund's NAV falls below \$1.00, the fund is said to "break the buck." Gorton and Metrick also suggest new limits for repo transactions, including a licensing requirement for non-bank entities seeking repo funding, strict quality requirements for collateral, position limits and mandatory overcollateralization. *Shadow Banking*, *supra* note 45, at 23-24.

<sup>96</sup> Dodd-Frank Act § 113(a)(1) (to be codified at 12 U.S.C. § 5323(a)(1)) (giving the Financial Stability Oversight Council the power to determine that a U.S. nonbank financial company can be supervised).

<sup>97</sup> Rosa María Lastra, *Systemic Risk, SIFIs and Financial Stability*, 6 CAPITAL MARKETS L.J. 197, 209-10 (2011).

<sup>98</sup> *Systemic Risk*, *supra* note 10, at 211, 240.

<sup>99</sup> *See id.* at 240-43 (discussing other possible regulatory measures, such as ensuring liquidity through a liquidity provider of last resort).

<sup>100</sup> *See Regulating Complexity in Financial Markets*, *supra* note 49, at 248-49 (arguing that "failures are almost inevitable in complex systems"). One aspect of chaos theory is deterministic chaos in dynamic systems, which recognizes that the more complex the system, the more likely it is that failures will occur. Thus, the most successful (complex) systems are those in which the consequences of failures are limited. In engineering design, for example, this can be done by decoupling systems through modularity that

remedies should focus on breaking the transmission and limiting the consequences of these failures.<sup>101</sup> In other contexts, I have shown how regulation could accomplish this, such as by ensuring liquidity to systemically important firms and markets, and by privatizing sources of liquidity in order to help internalize externalities and motivate private-sector monitoring.<sup>102</sup>

#### IV. *Conclusions*

Due to regulatory arbitrage and the increasing technological ability of non-banks to compete with traditional banks in providing financial products and services, shadow banking seems here to stay. I therefore have focused on how shadow banking should be regulated to try to maximize its efficiencies while minimizing its risks.<sup>103</sup>

---

helps to reduce a chance that a failure in one part of the system will systemically trigger a failure in another part.

<sup>101</sup> See *id.* (discussing the advantages of modularity in a complex system).

<sup>102</sup> Schwarcz, *supra* note 39 (manuscript at 29).

<sup>103</sup> As this article was going to press, I reviewed a new paper by two Federal Reserve economists on regulation of shadow banking. Tobias Adrian & Adam B. Ashcraft, “Shadow Banking Regulation,” Federal Reserve Bank of New York Staff Report No. 559 (Apr. 2012), available at [http://www.newyorkfed.org/research/staff\\_reports/sr559.pdf](http://www.newyorkfed.org/research/staff_reports/sr559.pdf). Their paper essentially argues that (i) shadow banks are inherently fragile because they engage in maturity transformation, thereby exposing themselves to rollover risk without having central bank safety nets; (ii) shadow banks therefore contracted for what was thought to be the equivalent: liquidity and credit put options with traditional banks; (iii) because of neglected risks (such as failure to see correlations, underappreciated agency problems, and long intermediation chains that obscured information), traditional banks underpriced the risk of these liquidity and credit arrangements and thus entered into too many of them (which ultimately required tapping public funds to help avoid traditional bank failures). Therefore, (iv) regulatory reform should focus on increasing the transparency, and thus enabling more appropriate pricing, of shadow-bank liquidity and credit arrangements. As economists, Adrian and Ashcraft focus on pricing—as do I in analyzing regulation focused on maximizing economic efficiency (see *supra* Part III.A). I conclude, however, that regulation cannot correct all the market inefficiencies. See *supra* note 85 & accompanying text (“Regulation can help to control, but cannot completely eliminate those failures.”). For that reason, I argue, regulation aimed at increasing transparency and enabling more accurate pricing is necessary but insufficient. We need to focus also

The fact that shadow banking is itself not well defined inherently limits my analysis. I have attempted to define it tentatively by identifying its overall scope and basic characteristics. Focusing on those fundamentals, my analysis is more conceptual than applied. A question for future inquiry will be the extent to which actual regulation of shadow banking should more closely target specific fact patterns.<sup>104</sup>

My Address also does not purport to examine *who* should regulate shadow banking. I merely note, in closing, that traditional financial regulatory agencies tend to be compartmentalized, each focusing on its specific mandate—for example, regulation of specific types of financial institutions, such as banks; or regulation of specific types of financial products, such as securities or derivatives.<sup>105</sup> Because shadow banking cuts across these categories, its regulation may well require a more holistic effort or, at least, better cross-agency coordination than currently exists for financial regulation.

Thank you.

---

on how regulation can help to mitigate the harmful consequences of mispricing and systemic failure. *See supra* Part III.B.

<sup>104</sup> *Cf. supra* note 88, and accompanying text (proposing actual regulation tied to a particular fact pattern); E-mail from Dan Awrey, Univ. Lecturer in Law & Finance, Univ. of Oxford, to author (Jan. 24, 2012, 12:18 PM) (emphasis in original) (on file with author) (saying that he is “increasingly of the view that the prevailing notion of ‘shadow banking’—which throws a number of divergent institutions, instruments and markets into the same bucket—has become a meaningful obstacle to regulatory reform in a number of key areas (esp. wholesale funding markets). There are many different *objects* of (potential) regulation wrapped up in this definition, each manifesting different *issues* and requiring different regulatory *responses*.”).

<sup>105</sup> *See, e.g.,* Dodd-Frank Act, Pub. L. No. 111-203, § 712(b), 124 Stat. 1376, 1642-43 (2010) (to be codified at 15 U.S.C. § 8302(b)) (dividing regulatory jurisdiction for “swaps” and “security-based swaps” between the Commodity Futures Trading Commission and Securities and Exchange Commission, respectively).