

# Dynamic Loss Probabilities and Implications for Financial Regulation\*

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## Abstract

*Much of financial regulation and supervision is devoted to ensuring the safety and soundness of financial institutions. Such micro- and macro-prudential policies are almost always formulated as capital requirements, leverage constraints, and other statutory restrictions designed to limit the probability of extreme financial loss to some small but acceptable threshold. However, if the risks of a financial institution's assets vary over time and across circumstances, then the efficacy of financial regulations necessarily varies in lockstep unless the regulations are adaptive. We illustrate this principle with empirical examples drawn from the financial industry, and show how the interaction of certain regulations with dynamic loss probabilities can have the unintended consequence of amplifying financial losses. We propose an ambitious research agenda in which legal scholars and financial economists collaborate to develop optimally adaptive regulations that anticipate the endogeneity of risk-taking behavior.*

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## I. Introduction

In the wake of the Financial Crisis of 2007-2009, it has become clear that financial stability can no longer be taken for granted and there is growing doubt that the existing regulatory framework is sufficient for addressing “systemic risk.” Despite the sweeping changes that have been and are yet to be made by the Dodd-Frank Act of 2010, the impact of this new legislation on ensuring financial stability is still unclear, largely because we do not have any single framework in which to define and quantify systemic risk—if it cannot be measured, it cannot be managed.

In this Article, we contribute to the development of such a framework by focusing on the recent failure of a central function of financial regulation—to reduce the probability of financial loss of regulated entities to some acceptable threshold—and proposing methods for ensuring that these regulations function as intended.

The starting point for our analysis is the fact that unanticipated financial losses—especially sudden extreme losses—trigger coordinated responses among the losers that can threaten financial stability when the losers are sufficiently large in size or number. Any financial risk entails the possibility of loss; the relevant question for financial stability is whether the parties at risk can withstand such loss, and this, in turn, depends on whether these parties have correctly anticipated the likelihood of and have properly prepared for the loss. Unanticipated losses can cause widespread panic in the form of flights to safety, rapid price declines, and the evaporation of liquidity that, once triggered, are impossible to contain.

The classic example is, of course, a bank run, for which we have developed elaborate legal and institutional remedies over the past century, e.g., capital requirements, “prudent investment” rules, deposit insurance, and the Federal Reserve as a lender of last resort. Given that losses in financial dealings are both uncertain and impossible to avoid consistently, at best, financial regulation can only affect the likelihood and magnitude of such losses. More formally, Lo and Brennan have proposed a simple but general framework that models financial regulations as a desire to limit the probability

of losing more than a certain amount  $X$  over some period  $t$  to an upper bound  $\gamma$ :<sup>1</sup>

$$\text{Prob}(\text{net profit or loss over period } t < -\$X) < \gamma \quad (1)$$

By determining the magnitude of loss  $X$  that can destabilize a regulated entity, a financial regulator can set constraints on the entity's risk-taking ability so as to reduce the likelihood of such a loss to some acceptably small level  $\gamma$ , e.g., 0.5%.<sup>2</sup>

However, the existing regulatory framework was largely crafted over half a century ago and did not anticipate the emergence of the so-called "shadow banking system," which refers to money market funds, insurance companies, hedge funds, and other financial institutions that are largely beyond the reach of bank regulatory oversight but share many of the same functions as banks.<sup>3</sup> More importantly, the bulk of the regulatory framework prior to Dodd-Frank was developed during much simpler times when the pace of financial interactions and innovation was considerably slower, the size of the financial industry was considerably smaller, and the scope of the financial system was considerably narrower. This allowed regulators to respond effectively in real time as crises emerged.

But regulators can no longer count on being able to first observe a crisis, and then intervene. Recent experiences such as the subprime mortgage defaults of 2007-2009, the "Quant Meltdown" of August 2007, the collapse of Bear Stearns, AIG, and Lehman Brothers in 2008, and the "Flash Crash" of May 6, 2010 are examples of unanticipated losses that were too large, too broad, and too fast for existing regulatory bodies and tools to prevent. Recent proposals for "taking away the punch bowl" at the height of the party, i.e., "counter-

1. See Andrew W. Lo & Thomas J. Brennan, *Do Labyrinthine Legal Limits on Leverage Lessen the Likelihood of Losses? An Analytical Framework*, 90 TEX. L. REV. 1775, 1777, 1792-93 (2012).

2. If, for example, a bank cannot withstand a loss of \$100 million over the course of a month, then its regulator may wish to constrain its risk-taking activities so that the probability that it loses \$100 million in any given month is 0.5%. If the constraint is accurately implemented, the bank should breach that critical level of losses only once every 200 months. At such a level of risk, other mechanisms for ensuring the safety and soundness of the banking system such as deposit insurance and a lender of last resort should suffice.

3. The Dodd-Frank Act created the means to bring certain of these shadow banking institutions under the purview of the Federal Reserve System by designating them to be "Systemically Important Financial Institutions" (SIFIs). See Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376, 1802-21 (codified as amended at 12 U.S.C. §§ 5461-72 (2012)) (defining SIFIs and providing for payment, clearing and settlement supervision, and elsewhere); *Id* at 1822-1955 (codified as amended at 15 U.S.C. § 78a (2012)) (providing for investor protection and improvements to securities regulation, including establishment of a financial oversight council, and elsewhere). However, only a handful of non-bank institutions have received such designations to date, and it will be years before we can determine whether this mechanism is sufficient to address the systemic risks posed by this part of the financial system. In any case, the SIFI designation does not address the mismatch between traditional macroprudential regulation and the speed, scope, and size of today's financial institutions.

cyclical” capital buffers, implicitly recognize the importance of unanticipated losses and the need for more dynamic regulatory responses, but those proposals do not explicitly model the dynamics of loss probabilities in formulating their policies and, as a result, may not be responsive enough.<sup>4</sup> In particular, if macroprudential regulations are imposed using inaccurate information such as outdated estimates of current risk exposures, then unintended threats to financial stability can easily emerge as economic conditions shift.

In this Article, we extend Lo and Brennan’s analysis to cases in which loss probabilities are dynamic and argue that financial regulation must be equally dynamic to be effective.<sup>5</sup> Controlling the likelihood of unanticipated losses as market conditions vary requires a detailed understanding of the behavior of financial asset prices. Although prices are random, they generally have a degree of structure. Simple models often assume that asset returns follow a stable pattern, e.g., a lognormal distribution, over time. In these models, one does not know for sure whether an asset price will fall below a certain level, but one does know with greater certainty the probability that the price will fall below that level. Unfortunately, price processes in the real world are seldom truly stable over time. They can change swiftly, as can their co-movement with other asset prices. As a result, continuous monitoring and rapid updating of leverage and capital requirements are generally necessary to keep losses to within a specified level of statistical confidence.

We illustrate this challenge by investigating the properties of foreign currency exchange rates for seven major currencies through time. Currency markets are among the largest and most active financial markets in the world, affecting virtually every major corporation, industry, and sovereign entity. Because foreign exchange rates are routinely roiled by macroeconomic shocks, central banking interventions, and geopolitical upheaval, the dynamics of foreign-currency loss probabilities are particularly relevant for our purposes. After showing that these loss probabilities change dramatically through time, we illustrate the implications for regulation by examining how the Chicago Mercantile Exchange dynamically changes its margin requirements for foreign exchange futures contracts in response to changes in risk.

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4. See, e.g., Markus K. Brunnermeier et al., *THE FUNDAMENTAL PRINCIPLES OF FINANCIAL REGULATION* 31-38, 57, 72 (2009). The “punch bowl” metaphor for financial regulatory interventions was first used in a speech by Federal Reserve Chairman William McChesney Martin in which he said: “The Federal Reserve . . . is in the position of the chaperone who has ordered the punch bowl removed just when the party was really warming up.” William McChesney Martin, Chairman, Bd. of Governors, Fed. Reserve Sys., Address before the New York Group of the Investment Bankers Association of America 12 (Oct. 19, 1955) (transcript available at [http://fraser.stlouisfed.org/docs/historical/martin/martin55\\_1019.pdf](http://fraser.stlouisfed.org/docs/historical/martin/martin55_1019.pdf)).

5. The dynamic nature of financial risk is well known. For an example of dynamic risk management by private parties, see the discussion in Section 3 of the Chicago Mercantile Exchange’s system designed for this purpose. For a discussion of the failure of many prior regulations to account for the dynamic nature of financial risk, see Lo & Brennan, *supra* note 1.

However, time variation in asset price dynamics can also be driven by the financial system itself, even by the very regulations designed to constrain that system, and such sources of risk are the subject of extensive study in the economics literature.<sup>6</sup> One simple example is a regulatory capital requirement that constrains a financial entity to maintain a certain amount of equity relative to the amount of risky assets that it holds. If the value of the risky assets decreases, the entity may need to divest itself of some of those assets to comply with the regulation. This sale may have an adverse impact on asset prices, particularly if many entities are in similar situations at the same time. The result may be a so-called “fire sale” of assets that increases losses and drives up asset price volatility, at least in the short term. This effect may also become self-reinforcing, with entities forced to sell even more assets because of their own impact on prices. Thus, an ostensibly salutary regulatory capital requirement can amplify small shocks and destabilize the entire system under certain conditions.

The simple tripping of regulatory limits and induced fire sales is not the only way the statistical properties of market prices can be altered by forces solely within the financial system. The interactions can be much more subtle, as is the case when economic entities engage in sophisticated trading strategies that exploit time-varying market conditions. We illustrate this possibility with the specific example of a class of dynamic trading strategies that consist of buying “losers” and selling “winners,” purchasing securities that have experienced recent price declines and short-selling securities that have experienced recent price appreciation. In doing so, such trading strategies are betting on mean reversion—today’s losers becoming tomorrow’s winners and vice versa—but an unintended consequence of this strategy is to dampen price volatility if many funds are trading using this same strategy in sufficient size to

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6. See, e.g., Tobias Adrian & Hyun Song Shin, *Liquidity and Leverage*, 19 J. FIN. INTERMEDIATION 418 (2010) (providing evidence that marked-to-market leverage is procyclical and has aggregate consequences for market risk); Markus K. Brunnermeier & Lasse Heje Pedersen, *Market Liquidity and Funding Liquidity*, 22 REV. FIN. STUD. 2201 (2009) (developing a model that shows that under certain conditions margin requirements are destabilizing with the possibility of liquidity spirals); Jon Danielsson, Hyun Song Shin & Jean-Pierre Zigrand, *The Impact of Risk Regulation on Price Dynamics*, 28 J. BANKING & FIN. 1069 (2004) (using simulations to show that the feedback effects of risk management may exacerbate financial instability); Ana Fostel & John Geanakoplos, *Why Does Bad News Increase Volatility and Decrease Leverage?*, 147 J. ECON. THEORY 501 (2012) (developing a model explaining why leverage decreases during periods of high volatility); Ana Fostel & John Geanakoplos, *Leverage Cycles and the Anxious Economy*, 98 AM. ECON. REV. 1211 (2008) (showing how fluctuations in endogenous leverage levels, referred to as the “leverage cycle,” can cause contagion and flight to collateral); Johannes Brumm, Michael Grill, Felix Kubler, and Karl Schmedders, *Margin Regulation and Volatility* (Swiss Fin. Inst. Research Paper No. 13-59, Dec. 2, 2013) (examining the relationship between margin requirements and asset volatility); John Dai & Suresh Sundaresan, *Risk Management Framework for Hedge Funds Role of Funding and Redemption Options on Leverage* (Mar. 21, 2010) (unpublished manuscript) (modeling hedge fund leverage and returns as constrained by obligations to investors and prime brokers); Jon Danielsson, Hyun Song Shin, and Jean-Pierre Zigrand, *Procyclical Leverage and Endogenous Risk* (Oct. 4, 2012) (unpublished manuscript) (exploring the connection between fluctuations in leverage and fluctuations in financial conditions).

have an impact on market prices. In such situations, a single macro shock that causes prices to trend instead of mean-revert can generate simultaneous losses among all funds implementing this strategy. This forces the funds to reduce their positions at the same time, which only exacerbates their losses and amplifies volatility as they reduce their volatility-dampening trading. This macro shock can affect investors who had no part in the dynamic trading strategy, but were only passive investors in the underlying securities. Such innocent bystanders may have decided on their investment holdings using historical volatility estimates that are no longer accurate because they did not account for the effect of mean-reversion traders coming into and out of the market.

Of course, the extent to which swiftly varying price distributions and endogenous volatility are problematic is largely an empirical question, and the prospect of unexpected loss, rapid unwinding of positions, and artificial volatility reduction may well be sufficiently remote to be of no concern. However, in this Article we provide empirical evidence to the contrary by simulating the historical performance of a simple mean-reversion trading strategy and documenting the dynamic nature of its probability of loss under various market conditions. We find evidence for a volatility/leverage feedback loop in which the proliferation of mean-reversion trading strategies dampens volatility, facilitating greater leverage that magnifies both gains and losses. To underscore the potential instabilities inherent in this vicious cycle, we provide a specific example involving the “Quant Meltdown” of August 2007, a unique event in which hedge funds and proprietary trading desks that employed mean-reversion strategies all suffered extreme losses over a few days for no apparent reason.

We conclude by proposing that financial regulation be formulated and implemented with these dynamic considerations in mind. More research must be undertaken to understand the full extent to which loss probabilities are dynamic and endogenous to the regulated financial system so that optimal adaptive regulations can be crafted. This poses a fundamental tension for policymakers because the standard for drafting objective, consistent, and easily enforceable securities laws is to propose “clear bright lines,” whereas complex goals such as equation (1) can only be achieved through “balancing tests.” Moreover, because regulated entities adapt to their environment, regulations can sometimes have the unintended consequence of motivating financial innovations that circumvent poorly designed constraints.

Systemic risk is not exogenous to the financial system but is determined jointly and endogenously by market participants and their regulators, and this endogeneity must be taken into account when formulating new regulations. In particular, the most effective regulatory framework is one that adapts flexibly over time, taking asset price dynamics into account with a self-awareness of its own impact on those dynamics.

## II. Dynamic Loss Probabilities in Currency Markets

To illustrate the extent to which the probability of loss can vary over time, raising the likelihood of unanticipated losses, in this Section we consider the dynamic properties of foreign currency exchange rates. A natural consequence of globalization is that businesses and investors are now more affected by fluctuating exchange rates than ever before. Even individual investors in U.S. mutual funds holding only domestic corporations will see their fortunes rise and fall with the U.S. dollar given the amount of business coming from Europe and Asia. Accordingly, managing currency risk has become one of the highest priorities for both the private sector and regulators. This market thus provides an ideal illustration of the practical relevance of dynamic loss probabilities.

We consider seven major currencies: the Australian Dollar (AUD), the Canadian Dollar (CAD), the New Zealand Dollar (NZD), the Swiss Franc (CHF), the European Euro (EUR), British Pound (GBP), and the Japanese Yen (JPY).<sup>7</sup> For each currency,  $X$ , we define its price at the end of day  $t$  to be the number of units of that currency that may be purchased by one U.S. dollar, and we write this value as  $P_{X,t}$ .<sup>8</sup> We compute the daily return for day  $t$  as:

$$R_{X,t} = \frac{P_{X,t}}{P_{X,t-1}} - 1 \quad (2)$$

Financial risk is often measured by return volatility—also known as return standard deviation—which captures the degree of variability of returns around its mean:

$$\sigma_{X,t} = \sqrt{\frac{1}{n-1} \sum_{k=1}^n (R_{X,t-k} - \bar{R}_{X,t})^2}, \quad \bar{R}_{X,t} \equiv \frac{1}{n} \sum_{k=1}^n R_{X,t-k} \quad (3)$$

In our analysis, we set  $n = 125$  days to yield an estimate of volatility that is flexible enough to change as market risk changes, but long enough to yield an accurate estimate, and we multiply this estimate by  $\sqrt{250}$  to annualize it.<sup>9</sup>

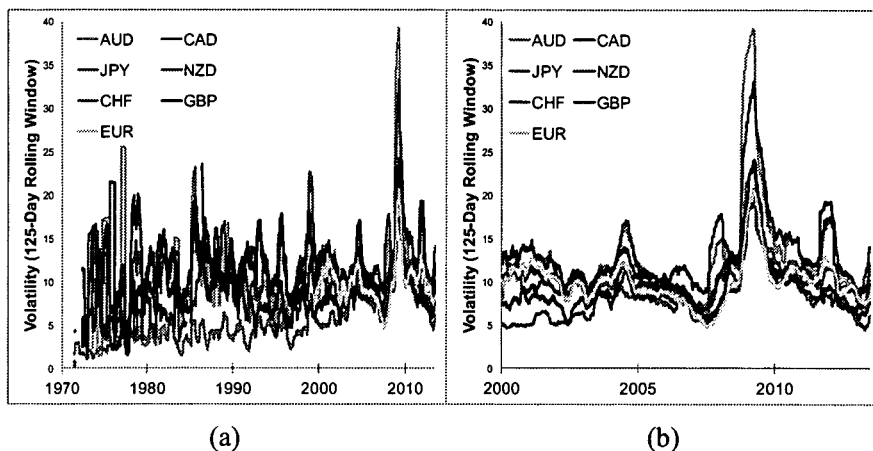
Volatility also plays a critical role in determining loss probabilities given that the calibration of equation (1) almost always depends on a volatility

7. We obtained historical data for these seven currencies from the H10 report of the Federal Reserve Board, which we accessed through Wharton Research Data Services. The data sets analyzed for the currencies generally run from 1971 through 2013, except for the data set for the euro, which runs from its inception in 1999 through 2013.

8. For many currencies, the reciprocal of our price is often the way that quotes of currency value are given. For our purposes, however, our definition of price is most useful because it views the currency as something in which dollars can be invested.

9. There are approximately 250 trading days in a calendar year. See, e.g., *Holidays*, N.Y. STOCK EXCH., <http://www.nyx.com/holidays-and-hours/nyse> (last visited Dec. 21, 2013) (showing that the NYSE is closed for 9 holidays and approximately 104 weekend days each year, leaving roughly 250 trading days).

parameter. Specifically, higher levels of volatility imply a greater chance of large positive and negative returns. Estimating timely measures of volatility is therefore essential to any risk management protocol. As Figure 1 shows, there is substantial variation in the volatility for each currency over time, implying highly dynamic loss probabilities.



**Figure 1.** 125-day rolling-window volatility estimates of seven major currencies, including the Australian Dollar (AUD), the Canadian Dollar (CAD), the New Zealand Dollar (NZD), the Swiss Franc (CHF), the European Euro (EUR), the British Pound (GBP), and the Japanese Yen (JPY). Estimates are based on daily data from: (a) 2000 to 2013; and (b) 1971 to 2013. All estimates are annualized by multiplying by  $\sqrt{250}$ .

In addition to their time-varying volatilities, currency returns also exhibit time-varying co-movements and these co-movements are important determinants of the overall volatility of portfolios of foreign exchange.<sup>10</sup> To analyze the co-movement of the returns for investments in the seven currencies, we calculate the correlation of the returns for each pair of currencies. At each point in time, we compute these numbers based on the prior 125 days of data.<sup>11</sup> To gauge the degree to which the currencies are all moving together, we calculate the average of the pairwise correlations of returns to investments in the seven currencies:

$$\text{Average of Pairwise Correlations} = \frac{1}{7 \times 6} \sum_{i,j \in C, i \neq j} \text{Corr}(R_i, R_j) \quad (4)$$

10. Specifically, the variance of a portfolio of assets is the weighted sum of the individual assets' variances and all pairwise covariances.

11. Note that there is no need to multiply by a factor to annualize correlation—as was the case with volatility—because the units of correlation are invariant with respect to time. Specifically, correlation is the ratio of covariance to the product of two standard deviations, and both the numerator and denominator in this ratio scale linearly with time. See GEZA SCHAY, INTRODUCTION TO PROBABILITY WITH STATISTICAL APPLICATIONS 158 (2007).



where  $C \equiv \{\text{AUD, CAD, CHF, EUR, GBP, JPY, NZD}\}$ .<sup>12</sup> If the currencies are statistically independent of each other, then we would expect this average to be approximately zero. Alternatively, if the currencies are all highly correlated, we would expect the average to be close to one. In fact, the average has varied significantly over time, as shown in Figure 2. The average since 2000 has frequently been as low as 0.3 and has been as high as 0.7. A more sophisticated analysis using the eigenvalues of the correlation matrices confirms this pattern—periodically, currency movements become highly correlated and are driven by a single common factor.

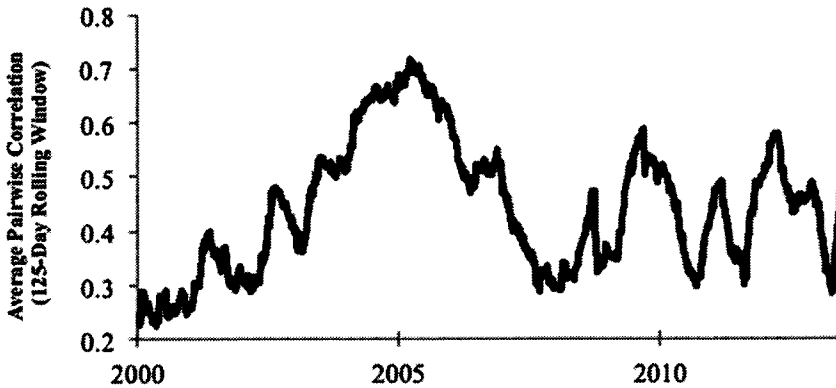


Figure 2. Average pairwise correlations of returns to investments of U.S. dollars in seven major foreign currencies, based on 125-day rolling-window correlation matrices from 2000 to 2013.

### III. Dynamic Loss Limits in Practice

A concrete example of dynamic loss limits in practice is the way many organized exchanges set and update margin requirements as market conditions vary, presumably to constrain the probability of loss to an acceptable level. In this Section we describe the approach taken by one of the leading exchanges, the Chicago Mercantile Exchange (CME). As one of the world's largest organized financial exchanges, the CME has developed several industry standards for setting margin requirements dynamically so as to insulate market participants and the exchange from default due to extreme losses.

The CME determines the appropriate amount of collateral for a particular participant using a sophisticated risk management system known as Standard Portfolio Analysis of Risk (SPAN). The margin requirements vary with the investment portfolio, and they are also regularly updated to reflect the current volatility and other attributes of the investment. According to the CME

12. Dividing by 42 is appropriate even though there are only 21 unique pairings because each pair of currencies appears twice in the sum.

website, “SPAN has become the industry standard for portfolio risk assessment. It is the official performance bond (margin) mechanism of over 50 registered exchanges, clearing organizations, service bureaus and regulatory agencies throughout the world.”<sup>13</sup>

The key to SPAN’s effectiveness is the speed with which it adjusts to changes in market conditions, particularly market risk. During periods of rapid volatility changes, SPAN reflects those changes and triggers corresponding changes in margin requirements. This has the effect of smoothing the changes in loss probabilities, thereby reducing the likelihood of unanticipated losses. Some researchers have argued that sharp increases in margin requirements can trigger financial crises,<sup>14</sup> and this observation underscores the importance of updating margin requirements as frequently as volatility changes. If margin requirements are continuously revised to yield relatively stable loss probabilities as market conditions change, the likelihood of a sudden and substantial increase in margin requirements is reduced.

The SPAN system does not remove all subjectivity and judgment from the process of evaluating portfolio risk exposures. SPAN is designed to compute how risky positions change in value following a variety of possible movements in various markets.<sup>15</sup> To start, SPAN evaluates the gains or losses in a portfolio under a number of scenarios.<sup>16</sup> With these scenarios, SPAN essentially builds a distribution of possible portfolio returns. The shape of the distribution depends upon the choice of such underlying parameters as the size of possible price and volatility movements for underlying assets. For some purposes, parameters must also be specified to determine probabilities of particular scenarios.<sup>17</sup> The various parameters must be frequently updated to reflect changes in market conditions, but such calculations require some judgment, as they are not pinned down by any formula. Similarly, additional modifications must be made for portfolios containing securities that are more vulnerable to extreme movement.<sup>18</sup> Once all the necessary inputs have been

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13. *Risk Management Overview*, CME GROUP, <http://www.cmegroup.com/clearing/risk-management> (last visited Dec. 6, 2013). Further details about the SPAN system are also available on the CME website.

14. See, e.g., Brunnermeier & Pedersen, *supra* note 6.

15. See generally CME GROUP, CME SPAN: STANDARD PORTFOLIO ANALYSIS OF RISK (2010), <http://www.cmegroup.com/clearing/files/span-methodology.pdf> (discussing how SPAN operates and giving examples).

16. According to the CME, “[m]ost SPAN exchanges or clearing organizations use 16 scenarios.” *Id.* at 6.

17. This is the case, for example, in the computation of “Composite Delta Scenarios.” *Id.* at 11.

18. As a specific example, “[d]eep out-of-the-money short options may pose significant risk, as unusually large price changes may result in unexpectedly large losses, particularly as expiration nears.” *Id.* at 10. Applying the SPAN methodology used for other assets to short options thus may not yield appropriate margins. Instead a “Short Option Minimum” can be manually inputted and used to take the place of the usual SPAN method if it is too low. *Id.* at 21.

provided, the system determines what the appropriate performance bond, i.e., margin requirement, should be.

Returning to the case of foreign currency investments, we collected the CME's historical margin requirements for investments in currency futures contracts.<sup>19</sup> Figure 3 illustrates the historical levels of the required margin for an initial investment by a speculative investor.<sup>20</sup> We show the margin level as a percent of dollars invested. The actual performance bond requirements of the CME are stated in dollars per contract, with the contract size varying depending on the particular currency at issue. We convert this into a percentage of dollars per contract by dividing the stated performance bond amount by the dollar amount corresponding to the contract on each date.<sup>21</sup> It also overlays 125-day trailing volatility—as measured by annualized standard deviation—for daily investment of dollars in the euro. This volatility curve has the same shape as that of a margin requirement that varies over time to maintain a fixed loss probability under the assumption that returns have zero expected return and volatility equal to the 125-day average.<sup>22</sup> As seen in the Figure, the CME margin requirements generally correlate strongly with recent volatility. Similar relationships hold for the remaining six currencies in our dataset.

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19. These contracts represent positions on future prices of the currencies, and historical margin requirements. See *List of Historical Margins by Name*, CME GROUP, <http://www.cmegroup.com/clearing/risk-management/historical-margins.html> (last visited Dec. 6, 2013). Specific details about the terms of the contracts are available on the CME website.

20. Ongoing maintenance margins are generally lower than initial margins, and investors who are hedging, rather than speculating, have a different set of margin requirements.

21. For euro futures, the contract size is 125,000 euros. To convert this into the corresponding dollar amount, we divide 125,000 by the spot exchange rate of euros per dollar on each day. Therefore, the margin per dollar invested we report for the euro is the stated performance bond divided by the converted dollar amount. See generally *EUR/USD*, CME GROUP, [http://www.cmegroup.com/trading/fx/g10/euro-fx\\_contract\\_specifications.html](http://www.cmegroup.com/trading/fx/g10/euro-fx_contract_specifications.html) (last visited Dec. 6, 2013) (providing further details about the contracts involved).

22. Specifically, consider a model that assumes that returns are normally distributed with mean zero and volatility equal to the 125-day trailing value. To ensure that the probability of loss to the clearinghouse is no more than  $g$ , the performance bond should be equal to  $-F^{-1}(g) \cdot s_t$ , where  $s_t$  is the 125-day trailing volatility at time  $t$  and  $F^{-1}$  is inverse cumulative distribution function for the standard normal distribution with mean zero and unit variance. Thus, the margin requirement in this case is equal to a constant multiple of recent volatility, and it is for this reason that the curves traced out by the margin requirement and by historical volatility have the same shape over time. A similar situation occurs if the normal distribution is replaced by an instance of Student's  $t$ -distribution.

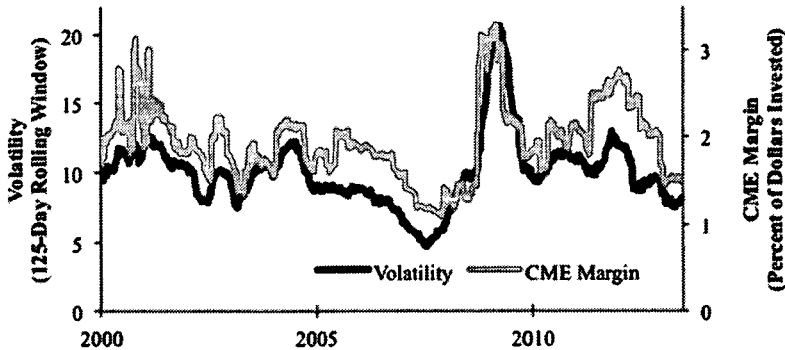


Figure 3. Volatility of daily returns for investment in U.S. dollars in the euro, along with historical margin requirements of the CME for euro futures contracts. The volatility is calculated for the prior 125 days and annualized by multiplying by  $\sqrt{250}$ . The CME margin is the level required for an initial investment by a speculative investor. The margin reported is the percentage of dollars invested in the contract, as explained further in the text.<sup>23</sup>

Of course, even the most sophisticated risk management techniques of private clearinghouses do not guarantee complete protection in all circumstances. There have been examples of clearinghouse failures in the past,<sup>23</sup> and concerns have been raised recently about clearinghouse risk in light of the increased volume of clearinghouse demand created by Dodd-Frank.<sup>24</sup> Nonetheless, state-of-the-art risk management systems such as SPAN serve as a useful proof-of-concept for the importance of dynamic loss probabilities.

The SPAN system is critical to the CME for protecting its clearinghouse against defaults, and it incorporates the types of adaptive and dynamic updating that regulation of the financial system should also incorporate. It is not, however, concerned with managing systemic risk. Financial regulation should be informed by such private-sector examples and implement systems in the same spirit, but the focus of macroprudential policies is the entire financial system. Therefore, such policies need to account not just for losses at the clearinghouse level, but losses at the level of the macroeconomy. In addition, they need to incorporate changes in pricing dynamics resulting both from

23. For example, Caisse de Liquidation became insolvent in 1974 and Kuala Lumpur Commodity Clearing House was forced to stop trading in 1983. See Matthew Leising & Bradley Keoun, *Swaps 'Armageddon' Lingers as New Rules Concentrate Risk*, BLOOMBERG, Dec. 21, 2012, <http://www.bloomberg.com/news/2012-12-21/swaps-armageddon-lingers-as-new-rules-concentrate-risk.html>. There has also been stress on U.S. futures markets in times of crisis, as witnessed by more than \$4 billion in margin calls by Chicago futures markets in October 1987. *Id.*; see also Ben Bemanke, *Clearing and Settlement During the Crash*, 3 REV. FIN. STUD. 133, 147 (1990).

24. One of the provisions of Dodd-Frank requires many swaps that were previously traded over the counter to be traded through clearinghouses, which will substantially increase the volume of trades and risks handled by clearinghouses. See Leising & Keoun, *supra* note 23.

exogenous events and trading strategies, as well as the endogeneity of adaptive behavior and the impact of the regulatory requirements themselves.

A further difference is that the CME deals with highly liquid instruments for which changes in volatility and price processes may be readily observed and incorporated into new margin requirements. Regulation of the entire financial system must deal with investments that may not be as easily valued or traded at all times. The challenges to regulators are thus significantly different in nature from those faced by the private sector. Nonetheless there is much that can be learned from the way sophisticated financial institutions such as the CME use dynamic and adaptive rules to limit their losses.

#### IV. Proprietary Trading and Leverage Constraints

The fact that leverage, market risk, and loss probabilities are interrelated is only one level of complexity in the dynamics of setting optimal leverage constraints. A more important level of complexity arises from the fact that many investors employ highly dynamic trading strategies that are state-dependent, and these strategies often interact with market risk to yield an even more challenging system that regulators must control. We provide a simple, but surprisingly realistic example in this Section based on a mean-reversion trading strategy first proposed by Lehmann, and Lo and MacKinlay, which can be analyzed directly using historical U.S. equity returns.<sup>25</sup> After describing the strategy and the role that leverage plays in determining its returns, we construct its daily returns from 1926 to 2012 and show how fixed leverage constraints would imply highly variable loss probabilities for the strategy across time.

Given a collection of  $N$  securities, consider a long/short market-neutral equity strategy consisting of an equal dollar amount of long and short positions, where at each rebalancing interval the long positions consist of “losers” (underperforming stocks, relative to some market average) and the short positions consist of “winners” (outperforming stocks, relative to the same market average). Specifically, if  $\omega_{it}$  is the portfolio weight of security  $i$  at date  $t$ , and if  $R_{it}$  denotes the return of security  $i$  on date  $t$ , then

$$\omega_{it} = -\frac{1}{N}(R_{it-k} - R_{mt-k}), \quad R_{mt-k} \equiv \frac{1}{N} \sum_{i=1}^N R_{it-k} \quad (5)$$

for some  $k > 0$ .

Note that the portfolio weights are the negative of the degree of outperformance  $k$  periods ago, so each value of  $k$  yields a somewhat different strategy. For our purposes, we set  $k = 1$  day. By buying yesterday’s losers and

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25. See Bruce N. Lehmann, *Fads, Martingales, and Market Efficiency*, 105 Q.J. ECON. 1 (1990); Andrew W. Lo & A. Craig MacKinlay, *When are Contrarian Profits Due to Stock Market Overreaction?*, 3 REV. FIN. STUD. 175 (1990).

selling yesterday's winners at each date, such a strategy actively bets on mean reversion across all  $N$  stocks, profiting from reversals that occur within the rebalancing interval. For this reason, (5) has been called a "contrarian" or mean-reversion trading strategy that benefits from market overreaction, i.e., when underperformance is followed by positive returns and vice-versa for outperformance.<sup>26</sup>

However, another source of profitability of mean-reversion trading strategies is the fact that they provide liquidity to the marketplace. By definition, losers are stocks that have underperformed relative to some market average, implying a supply/demand imbalance, i.e., an excess supply that caused the prices of those securities to drop, and vice-versa for winners. By buying losers and selling winners, contrarians are adding to the demand for losers and increasing the supply of winners, thereby stabilizing supply/demand imbalances. Traditionally, designated market-makers such as the NYSE/AMEX specialists and NASDAQ dealers have played this role, for which they are compensated through the bid/offer spread. But over the last decade, hedge funds and proprietary trading desks have begun to compete with traditional market-makers, adding enormous amounts of liquidity to U.S. stock markets and earning attractive returns for themselves and their investors in the process.

As liquidity providers, market-makers are often said to be "long volatility" because market-making profits generally increase with volatility. There are several reasons for this positive relation, but the most common explanation is that market-makers have no proprietary information about the fundamental value of a security and profit mainly from transacting because they earn the bid/offer spread for each round-trip trade in which they participate. Therefore, the most favorable set of market conditions for market-makers is when prices are not trending up or down but swinging back and forth vigorously, generating larger amounts of non-information-based liquidity trades.<sup>27</sup>

As volatility increases, market-makers' profits increase in lock-step, which inevitably draws more competitors into the industry. And as more market-making capital is deployed, its impact on prices becomes more pronounced. In particular, mean-reversion trading strategies tend to reduce market volatility because they attenuate the movement of prices by selling stocks for which there is excess demand and buying stocks for which there is excess supply. Therefore, an increasing amount of capital dedicated to market-making strategies is one potential explanation for the secular decline in U.S.

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26. See Lo & MacKinlay, *supra* note 24 (giving further details on the strategy); Amir E. Khandani & Andrew W. Lo, *What Happened to the Quants in August 2007?*, 5 J. INV. MGMT. 5, 29 (2007) (providing even further details on the strategy).

27. See Lawrence R. Glosten and Paul R. Milgrom, *Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders*, 14 J. FIN. ECON. 71 (1985).

equity-market volatility during the 10 years prior to the 2008 financial crisis. Once this market-making capital is withdrawn from the marketplace, volatility should pick up, as it did after the Quant Meltdown of August 2007. We shall return to this important volatility/leverage feedback loop in the sections below when we consider the endogeneity of volatility.

If mean reversion implies that contrarian trading strategies will be profitable, then momentum implies the reverse. In the presence of return persistence, i.e., positively autocorrelated returns, Lo and MacKinlay show that the contrarian trading strategy (5) will exhibit negative profits.<sup>28</sup> As with other market-making strategies, the contrarian strategy loses when prices exhibit trends, either because of private information, which the market microstructure literature calls “adverse selection,” or a sustained liquidation in which the market-maker bears the losses by taking the other side and losing value as prices move in response to the liquidation. Therefore, whether or not (5) is an interesting strategy in its own right, losses with respect to this particular strategy serve as a valuable indicator of broad-based liquidations of long and/or short positions, which occurred during the Quant Meltdown of August 2007, as discussed below.<sup>29</sup>

Note that the weights in (5) have the property that they sum to 0, which means that (5) is an example of an “arbitrage” or “market-neutral” portfolio where the long positions are exactly offset by the short positions.<sup>30</sup> As a result, the portfolio “return” cannot be computed in the standard way because there is no net investment. In practice, however, the return of such a strategy over any finite interval is easily calculated as the profit-and-loss of that strategy’s positions over the interval divided by the initial capital required to support margins on those positions. This feature of market-neutral strategies is why leverage is so central to the profitability of hedge funds and proprietary trading desks—more leverage means less capital tied up per dollar of profit-and-loss, hence higher potential rates of return.<sup>31</sup>

28. See Lo & MacKinlay, *supra* note 25, at 183-84.

29. See also Khandani & Lo, *supra* note 26; Amir Khandani & Andrew C. Lo, *What Happened to the Quants in August 2007?: Evidence from Factors and Transactions Data*, 14 J. FIN. MKT., 1 (2011).

30. Such a strategy is more accurately described as a “dollar-neutral” portfolio since dollar-neutral does not necessarily imply that a strategy is also market-neutral. For example, if a portfolio is long \$100 million of high-beta stocks and short \$100 million of low-beta stocks, it will be dollar-neutral but will have positive market-beta exposure. In practice, most dollar-neutral equity portfolios are also constructed to be market-neutral, hence the two terms are used almost interchangeably, which is sloppy terminology, but usually correct.

31. Specifically, suppose that a portfolio consisting of \$100 million of long positions and \$100 million of short positions generated profits of \$2 million over a one-day interval. The return of this strategy is simply \$2 million divided by the required amount of capital to support the \$100 million long/short positions. Under Regulation T, the minimum amount of capital required is \$100 million (often stated as 2:1 leverage, or a 50% margin requirement), hence the return to the strategy is 2%. See Margin Requirements, 12 C.F.R. §220.12 (2013). If, however, the portfolio manager is a broker/dealer, then Regulation T does not apply (other regulations govern the capital adequacy of broker/dealers, such as SEC Rule 15c3-1), and higher levels of leverage may be employed. For example, under certain

Lo and MacKinlay provide a detailed analysis of the unleveraged returns of the contrarian trading strategy, tracing its profitability to mean reversion in individual stock returns as well as positive lead/lag effects and cross-autocorrelations across stocks and across time.<sup>32</sup> However, for our purposes, such decompositions are of less relevance than simply using (5) as a tool to study the performance of leverage constraints over time and across different market environments. To that end, we apply this strategy to the daily returns of all stocks in the University of Chicago's CRSP Database from December 31, 1925 to September 30, 2012.<sup>33</sup>

Before turning to the performance of the leverage constraints over time, we summarize the strategy's historical performance to provide some intuition for its properties. Figure 4 shows the average return and Sharpe ratio for the strategy for holding periods of 1, 5 and 20 trading dates. The results are impressive. Over the course of the historical time period we consider, the strategy produced an average daily return of 1.96%, or 490% per year, assuming a 250-day year! Of course, this return is unrealistic because it ignores a number of market frictions such as transactions costs, bid/offer spreads, price impact, short-sales constraints, and other institutional limitations.<sup>34</sup> In

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conditions, it is possible to support a \$100 million long/short portfolio with only \$25 million of capital—leverage ratio of 8:1—which implies a portfolio return of \$2/\$25 = 8%. Note that the technical definition of leverage—and the one used by the U.S. Federal Reserve, which is responsible for setting leverage constraints for broker/dealers—is given as the sum of the absolute values of the long and short positions divided by the capital.

The gross dollar investment  $I_t$  of the portfolio (5) under Regulation T and its unleveraged portfolio return  $R_{pt}$  are given by:

$$I_t \equiv \frac{1}{2} \sum_{i=1}^N |\omega_{it}|, \quad R_{pt} \equiv \frac{\sum_{i=1}^N \omega_{it} R_{it}}{I_t} \quad (6)$$

To construct the leveraged portfolio return  $LR_{pt}(\theta)$  using a regulatory leverage factor of  $\theta:1$ , we simply multiply the formula for  $R_{pt}$  in (6) by  $\theta/2$ , so that

$$LR_{pt}(\theta) \equiv \frac{\theta}{2} \times \frac{\sum_{i=1}^N \omega_{it} R_{it}}{I_t} \quad (7)$$

Note that the Regulation T leverage requirement is currently 2:1 ( $\theta=2$ ), and this is equivalent to a multiplier of  $\theta/2=1$ . For this amount of leverage,  $LR_{pt}(\theta)$  is simply equal to  $R_{pt}$ .

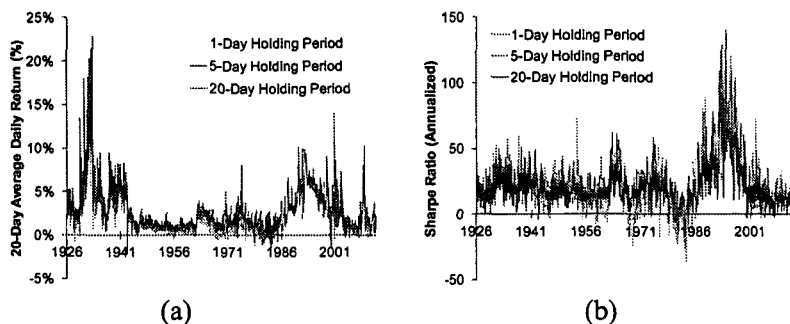
32. See Lo & MacKinlay, *supra* note 25, at 183-84, 201.

33. We use only U.S. common stocks (CRSP share code 10 and 11), which eliminates REITs, ADRs, and other types of securities.

34. However, Lo and MacKinlay provide a thorough analysis of all of these considerations and conclude that none of them can explain away the profitability of these strategies. See Lo & MacKinlay, *supra* note 25 192-201; Andrew W. Lo & A. Craig MacKinlay, *Stock Market Prices Do Not Follow Random Walks: Evidence from a Simple Specification Test*, 1 REV. FIN. STUD. 41, 56-60 (1988); Andrew W. Lo & A. Craig MacKinlay, *An Econometric Analysis of Nonsynchronous Trading*, 45 J. ECONOMETRICS 181, 198-203 (1990); ANDREW W. LO & A. CRAIG MACKINLAY, A NON-RANDOM WALK DOWN WALL STREET 287-346 (1999). Even more convincingly, a number of hedge



particular, a daily rebalancing interval would imply extraordinarily high turnover across the set of thousands of securities in our sample, which was simply not feasible through most of the sample period.<sup>35</sup>



**Figure 4.** Historical performance of the contrarian trading strategy with holding periods of 1, 5, and 20 days: (a) average daily returns, computed over non-overlapping blocks of 20 trading days; (b) Sharpe ratio for the same time periods, with the numerator taken to be the average daily return, and the denominator taken to be the standard deviation of the returns during the 20-day block. The Sharpe ratio value is annualized by multiplying by  $\sqrt{250}$ .

Figure 4(a) also shows a strong trend of declining average daily returns starting in the 1990s and beyond, a reflection of increased competition, changes in market structure, improvements in trading technology and electronic connectivity, the growth in assets devoted to this type of strategy, and the corresponding decline in U.S. equity-market volatility over the last decade.<sup>36</sup> This trend is closely related to the use of leverage, which we shall consider in more detail below.

To develop intuition for the magnitude of time variation in loss probabilities for dynamic trading strategies, consider the margin requirements for the mean-reversion strategy (5) with a 1-day holding period under a number of scenarios. We first derive the margin required under Regulation T, discussed above in note 34.<sup>37</sup> We then consider margin requirements that set the

funds and proprietary trading desks at major investment banks implemented strategies like this one during the 1980s and 1990s and were consistently profitable throughout this period.

35. The average number of securities in our sample from December 1925 to September 2012 is 2,985. During the period from 1972 onward, when both AMEX and NASDAQ stocks were included in the CRSP database, the average number of securities is 5,381. The high turnover and the large number of stocks involved also highlight the importance that technology plays in strategies like (5), and why funds that employ such strategies are predominantly quantitative.

36. Equity market-making profits are usually positively correlated with the level of volatility, see Glosten & Milgrom, *supra* note 27, and most quantitative equity market-neutral strategies have a significant market-making component to their returns, especially at higher trading frequencies.

37. This is the initial margin requirement, rather than the maintenance margin requirement which is generally lower. See *Maintenance Margin*, INVESTOPEDIA, <http://www.investopedia.com/terms/m/maintenancemargin.asp> (last visited Dec. 21, 2013). The Regulation T initial margin requirements have been changed by the Federal Reserve 24 times since 1934 when the first regulation was promulgated, though the requirements have not been changed since

proprietary trader's probability of a daily loss greater than the margin to 1% and assume that the distribution of returns has a volatility equal to that of the strategy for the previous 120 trading days, with either a normal distribution or a Student-*t* distribution with one or two degrees of freedom (which illustrates the impact of fat tails).

Figure 5 shows the historical margin levels under the various scenarios. Since the 1940s, Regulation T has yielded the highest levels, and the assumption of normality always produces the lowest levels.

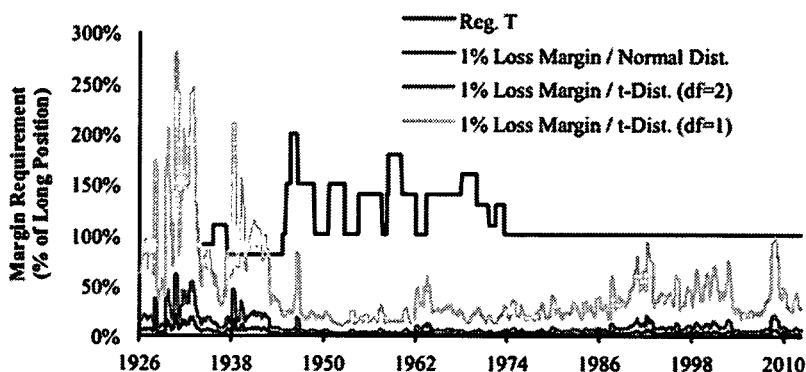


Figure 5. Historical margin requirements for the contrarian strategy with a 1-day holding period under various possible models for return distributions.

These results provide a compelling illustration of the fact that loss probabilities, leverage constraints, and market risk are inextricably intertwined. Hence time variation in one of these quantities necessarily implies time variation in the others. As long as market risk is constant, fixed leverage constraints may yield outcomes that regulators and policymakers expect. But during periods when market risk varies significantly, fixed leverage constraints may produce unexpected outcomes.

#### V. Volatility/Leverage Feedback Loops

Having established the time series properties of the mean-reversion trading strategy (5) using historical data, we are now able to examine the practical relevance of the self-reinforcing volatility/leverage feedback loop implied by this strategy. To that end, we investigate two simple empirical relations motivated by the market-making characteristics of mean-reversion strategies discussed above: (1) whether the profitability of the mean-reversion strategy is positively related to contemporaneous market volatility; and (2)

1974. See 98TH ANNUAL REPORT, BD. OF GOVERNORS OF THE FED. RESERVE SYS., 324 tbl. 8 (2011), <http://www.federalreserve.gov/publications/annual-report/files/2011-annual-report.pdf>.

whether increases in the profitability of market-makers are associated with subsequent declines in volatility.

Before turning to these two hypotheses, we provide a more detailed discussion of the potential mechanisms by which volatility and leverage are related, and how these mechanisms can affect macroprudential regulation.

Mean-reversion strategies such as (5), known more generally as quantitative equity market neutral strategies, became popular in the mid-1990s and assets under management grew steadily until reaching their peak in 2007 among the funds in the BarclayHedge database.<sup>38</sup> As the amount of assets in these strategies increased, the strategies' impact on market price dynamics also increased, helping to suppress market volatility during this period by placing upward price pressure on the losers and downward price pressure on the winners. Figure 7 contains a graph of the 125-day rolling-window volatility of the S&P 500 Total Return Index from January 2, 2002 to June 29, 2007 (solid line), clearly indicating a downward trend in market volatility in the aftermath of the bursting of the Internet Bubble.<sup>39</sup> As market volatility declined, broker/dealers were willing and able to offer greater amounts of leverage to their clients, including quantitative equity market neutral funds. The mean-reversion strategies pursued by these funds thus facilitated an even greater amount of available leverage, and as these funds took on more leverage, their potential losses would be magnified as well as their potentials gains. This magnification played a critical role in the Quant Meltdown of August 2007, which we describe in more detail below.

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38. See *infra* Figure 6. Because hedge funds and proprietary trading desks are not required to report their returns or assets under management, this information is available only on a voluntary basis. However, the figures collected by third parties such as BarclayHedge are likely to be highly correlated with aggregate industry figures.

39. This downward trend is also evident in forward-looking measures of risk such as the VIX Index, hence it is not simply an artifact of lagged information. See *infra* Figure 10. The market's collective wisdom during this period was that equity market risk had declined significantly.

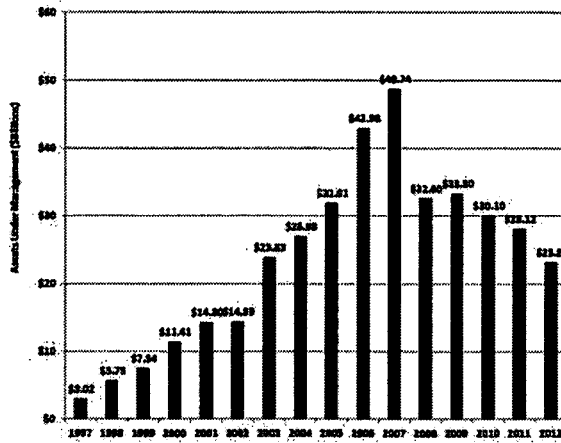


Figure 6. Assets under management among equity market neutral hedge funds in Barclay’s Hedge Fund Database from 1997 to 2012.

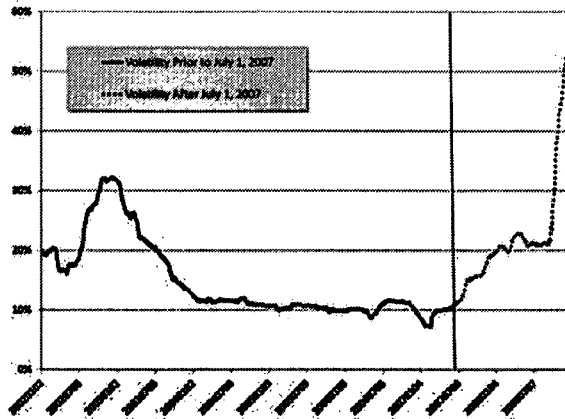


Figure 7. 125-day rolling-window volatility of the daily S&P 500 total return index from January 2, 2002 to June 29, 2007 (solid line) and July 2, 2007 to December 31, 2008 (dotted line).

The dynamic relation between trading strategies, leverage, and market risk may also reduce the effectiveness of fixed leverage constraints and macroprudential regulation. This challenge is a special case of the so-called “Lucas critique”<sup>40</sup> in which the potential impact of feedback effects of policy changes on human behavior can undermine the goals of such changes.<sup>41</sup> In the

40. Robert Lucas, *Econometric Policy Evaluation: A Critique*, in THE PHILLIPS CURVE AND LABOR MARKETS 19 (Karl Brunner & Allan H. Meltzer eds., 1976).

41. See Narayana Kocherlakota, *Modern Macroeconomic Models as Tools for Economic Policy*, THE REGION, May 2010, at 5-21, <http://www.minneapolisfed.org/pubs/region/10->

case of leverage constraints, the endogeneity of market risk was demonstrated by Danielsson, Shin, and Zigrand in a simple but compelling dynamic equilibrium model in which the imposition of Value at Risk (VaR) constraints on investors will, in equilibrium, have the perverse effect of increasing the volatility of the risky asset. The intuition for this rather surprising phenomenon is straightforward: imposing a VaR constraint on traders is akin to endowing them with time-varying risk aversion, where they become effectively more risk averse after suffering significant losses and reduce their positions. By unwinding their positions, they exacerbate their losses, leading to greater volatility.<sup>42</sup>

However, the traders in Danielsson, Shin, and Zigrand's framework do not employ particularly sophisticated trading strategies—they are short-term (one-period) expected-utility maximizers with constant absolute risk aversion.<sup>43</sup> In the case of proprietary traders who do engage in more dynamic trading strategies, the feedback effects can be even more complex and unexpected.

Going back to the empirical evidence of a feedback loop between market-making and volatility, to test the first hypothesis—that the profitability of the mean-reversion strategy (5) is contemporaneously related to market volatility—we calculate the historical correlation between changes in the returns to the contrarian trading strategy and changes in the volatility of an equally-weighted market index. Figure 8 illustrates the historical time series of the returns and volatility, and Table 1 shows the correlations of changes in the two amounts, both in the aggregate and by decade. With the exception of 1-day holding periods in the 1990s, all the correlations are positive, implying that increasing market volatility is associated with increasing profitability of the basic mean-reversion strategy (5).<sup>44</sup> These correlations provide significant evidence that the contrarian trading strategy indeed does explain a component of market volatility, and is particularly sensitive to relatively short-term changes in market volatility.

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05/2009\_mplsfed\_annualreport\_essay.pdf, for an excellent review of this important idea and its influence on modern macroeconomics and monetary policy.

42. Jon Danielsson, Hyun Song Shin & Jean-Pierre Zigrand, *Impact of Risk Regulation on Price Dynamics*, 28 J. BANKING & FIN., 1069, 1086 (2004).

43. *Id.* at 1073.

44. The sole negative entry, a statistically insignificant value of  $-0.01$ , can be explained by the fact that during this period a large influx of capital into long/short equity and equity market neutral hedge funds likely drove down the profitability of these strategies. See Khandani & Lo, *supra* note 26, at 24.

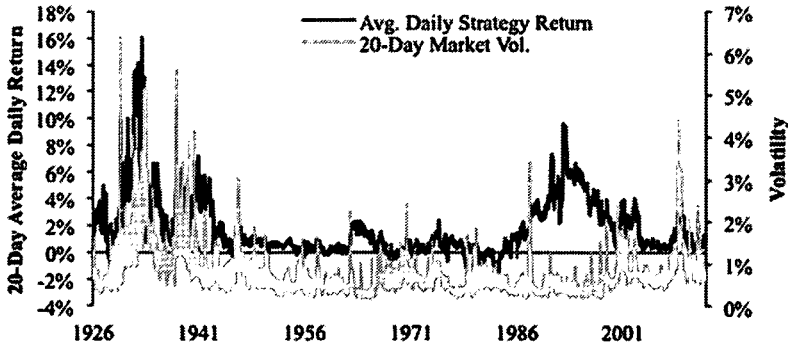


Figure 8. Historical average daily performance of the contrarian trading strategy with a 1-day holding period and the volatility of the equal-weighted market index. Each average daily return and volatility value is calculated during a block of 20 consecutive trading days, and the 20-day periods considered in the calculations are non-overlapping.

| Start      | End        | Mean (%) | SD (%) | Sharpe Ratio | Holding Period Corr. |        |         |
|------------|------------|----------|--------|--------------|----------------------|--------|---------|
|            |            |          |        |              | 1 Day                | 5 Days | 20 Days |
| 12/31/1925 | 12/31/1929 | 564.7    | 51.6   | 10.95        | 0.67                 | 0.73   | 0.64    |
| 1/1/1930   | 12/31/1939 | 1225.2   | 79.3   | 15.44        | 0.21                 | 0.31   | 0.33    |
| 1/1/1940   | 12/31/1949 | 494.0    | 38.7   | 12.75        | 0.28                 | 0.29   | 0.19    |
| 1/1/1950   | 12/31/1959 | 107.9    | 9.1    | 11.86        | 0.68                 | 0.38   | 0.07    |
| 1/1/1960   | 12/31/1969 | 173.2    | 17.9   | 9.70         | 0.46                 | 0.51   | 0.40    |
| 1/1/1970   | 12/31/1979 | 130.3    | 12.2   | 10.69        | 0.13                 | 0.48   | 0.40    |
| 1/1/1980   | 12/31/1989 | 232.2    | 26.4   | 8.78         | 0.23                 | 0.49   | 0.27    |
| 1/1/1990   | 12/31/1999 | 1121.5   | 34.5   | 32.52        | 0.02                 | 0.08   | 0.11    |
| 1/1/2000   | 12/31/2009 | 358.7    | 27.5   | 13.03        | 0.51                 | 0.59   | 0.41    |
| 1/1/2010   | 9/30/2012  | 194.3    | 17.4   | 11.14        | 0.50                 | 0.72   | 0.65    |
| 12/31/1925 | 9/30/2012  | 490.7    | 46.7   | 10.51        | 0.30                 | 0.40   | 0.34    |

Table 1. Means, standard deviations, and Sharpe ratios of the contrarian trading strategy with a 1-day holding period, and correlations between changes in average daily returns for the contrarian strategy and changes in the volatility of the equal-weighted market index, for 10-year subperiods and the entire sample period from December 31, 1925 to September 30, 2012. Means, standard deviations, and Sharpe ratios are computed using daily returns during the relevant time period and then annualized by multiplying by 250 in the case of the average and  $\sqrt{250}$  in the case of the standard deviation and the Sharpe ratio. Correlations are computed for contrarian strategies with 1-, 5-, and 20-day holding periods, but each average daily return and volatility value is calculated during a block of 20 consecutive trading days, and the 20-day periods considered in the calculations are non-overlapping. Changes are computed as the difference between one 20-day block of days and the immediately preceding 20-day block.

To test the second hypothesis—that increases in mean-reversion profits are associated with subsequent declines in volatility—we construct a value-

weighted index of all broker/dealers<sup>45</sup> and consider its relationship to volatility of the broader market. We hypothesize that broker/dealers derive profits from strategies that provide liquidity and thereby reduce volatility. This may include the contrarian strategy described above, but it may also include other possibilities.

We test our hypothesis by calculating the correlation between returns to broker/dealers and market volatility, as well as the correlation between the changes in these values. We illustrate returns for broker/dealers in Figure 9, and we report the correlations in Table 2. The changes are generally strongly negatively correlated, particularly in the short term. This implies that as broker/dealers become more profitable, market volatility is reduced. While we cannot conclude a causal relationship from mere correlations, the patterns are consistent with a volatility/leverage feedback loop.<sup>46</sup>

| Start    | End        | 20 Days | 40 Days | 60 Days | 120 Days | 250 Days |
|----------|------------|---------|---------|---------|----------|----------|
| 7/2/1962 | 12/31/1969 | -0.35   | -0.60   | -0.44   | -0.70    | -0.28    |
| 1/1/1970 | 12/31/1979 | -0.03   | -0.08   | -0.24   | -0.14    | -0.06    |
| 1/1/1980 | 12/31/1989 | -0.17   | -0.39   | -0.22   | -0.01    | -0.16    |
| 1/1/1990 | 12/31/1999 | -0.42   | -0.46   | -0.32   | 0.03     | -0.09    |
| 1/1/2000 | 12/31/2007 | -0.34   | -0.17   | -0.39   | 0.03     | -0.91    |
| 1/1/2007 | 9/30/2012  | -0.18   | -0.63   | -0.60   | -0.43    | -0.69    |
| 7/2/1962 | 9/30/2012  | -0.22   | -0.34   | -0.31   | -0.21    | -0.39    |

**Table 2.** Correlations between changes in average daily returns (reflecting dividends and compounding) for the value-weighted index of broker/dealers and changes in the volatility of the equal-weighted index of the entire market. Each average daily return and volatility value is calculated during a block of  $n$  consecutive trading days, where  $n$  is 20, 40, 60, 120, or 250 according to the labels at the top of the column, and the  $n$ -day periods considered in the calculations are non-overlapping. Changes are computed as the difference between one  $n$ -day block of days and the immediately preceding block of  $n$  days. The results are reported by decade, as well as in the aggregate since July 2, 1962.

45. We define our universe of broker/dealers equities to be those securities in the CRSP database with an SIC value of 6211. Our index begins on July 2, 1962, when securities of this type first were listed as part of the CRSP database.

46. This empirical evidence is also consistent with the common empirical intuition that short-term volatility is mean-reverting. However, this intuition is typically devoid of any economic justification, but based instead on the time series properties of short-term volatility measures. For example, a simple first-order autoregressive model of volatility,

$$\sigma_t = \mu_\sigma + \rho(\sigma_{t-1} - \mu_\sigma) + \epsilon_t, \rho \in (0,1) \tag{8}$$

can generate the pattern observed in Table 2 if we assume that broker/dealers can observe  $\sigma_t$  without error and adjust their leverage constraints appropriately. Our proposed explanation for the dynamics of leverage and volatility endogenizes (8) and provides the mechanism by which volatility changes and institutional and regulatory structures that facilitate those changes.

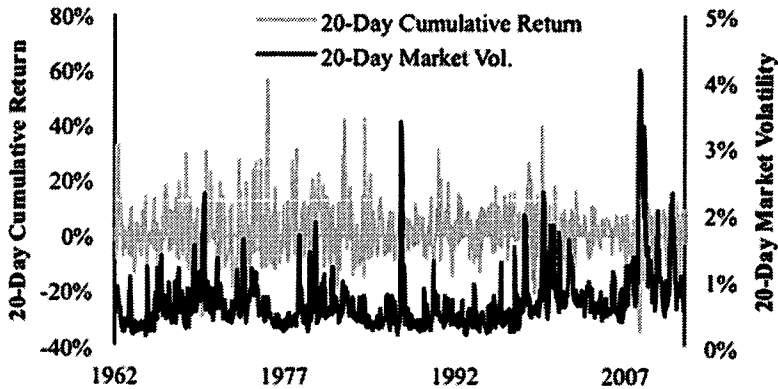


Figure 9. Historical daily performance of the broker/dealer value-weighted index and the volatility of the equal-weighted market index. Each average daily return and volatility value is calculated during a block of 20 consecutive trading days, and the 20-day periods considered in the calculations are non-overlapping.

## VI. The “Quant Meltdown” of August 2007

To develop a deeper appreciation for the implications of the volatility/leverage feedback loop, consider the fate of quantitative equity market-neutral funds during the second week of August 2007 when, without any warning, they all suffered significant losses at the same time, including some of the most prominent and consistently profitable firms.<sup>47</sup> One of the hardest hit was the Global Equity Opportunities Fund of Goldman Sachs. David Viniar, Chief Financial Officer of Goldman Sachs, observed that “[w]e were seeing things that were 25-standard deviation moves, several days in a

47. For example, the *Wall Street Journal* reported on August 10, 2007 that:

After the close of trading, Renaissance Technologies Corp., a hedge-fund company with one of the best records in recent years, told investors that a key fund has lost 8.7% so far in August and is down 7.4% in 2007. Another big fund company, Highbridge Capital Management, told investors its Highbridge Statistical Opportunities Fund was down 18% as of the 8th of the month, and was down 16% for the year. The \$1.8 billion publicly traded Highbridge Statistical Market Neutral Fund was down 5.2% for the month as of Wednesday.

.... Tykhe Capital, LLC—a New York-based quantitative, or computer-driven, hedge-fund firm that manages about \$1.8 billion—has suffered losses of about 20% in its largest hedge fund so far this month. . . .

Gregory Zuckerman, James R. Hagerty & David Gauthier-Villars, *Impact of Mortgage Crisis Spreads*, WALL ST. J., Aug. 10, 2007, A1. On August 14, the *Wall Street Journal* reported that the Goldman Sachs’ Global Equity Opportunities Fund “lost more than 30% of its value last week.” Henny Sender, Kate Kelly & Gregory Zuckerman, *Goldman Wagers On Cash Infusion To Show Resolve*, WALL ST. J., Aug. 14, 2007, A1.



row . . . There have been issues in some of the other quantitative spaces. But nothing like what we saw last week.”<sup>48</sup>

It was no coincidence that all of these funds were engaged in the same type of trading strategy, nor that the strategies used by the funds depended critically on the amount of leverage that was available. This “Quant Meltdown” of August 2007 has been studied by several authors,<sup>49</sup> and with the benefit of hindsight and the simulations and empirical analysis described above, a common narrative has emerged.

During the first half of 2007, rising interest rates and declining U.S. residential real estate prices contributed to the growing losses of fixed-income portfolios with exposure to subprime-mortgage-related debt and its derivatives.<sup>50</sup> By the summer of 2007, investors were beginning to realize the seriousness of the problems in the mortgage market. On June 7, 2007, Bear Stearns suspended redemptions from its High-Grade Structured Credit Strategies Enhanced Leverage Fund in a desperate attempt to forestall disaster in a fast-moving market. By July 31, this fund and its higher-leverage counterpart lost most of their value, filed for bankruptcy under Chapter 15,<sup>51</sup> and were liquidated.

In this increasingly stressful atmosphere of market turmoil, Khandani and Lo conjecture that a single equity market neutral fund or trading desk decided to reduce its market exposure by liquidating a portion of its investments.<sup>52</sup> In doing so, it was either large enough or impatient enough to have moved the

48. Peter Thal Larsen, *Goldman pays the price of being big*, FIN. TIMES, Aug. 14, 2007, at 37.

49. See, e.g., GOLDMAN SACHS GLOBAL QUANTITATIVE EQUITY GRP., *THE QUANT LIQUIDITY CRUNCH* (2007); MATTHEW ROTHMAN, LEHMAN BROS. RESEARCH, *U.S. EQUITY QUANTITATIVE STRATEGIES: VIEW FROM QUANTLAND—WHERE DO WE GO NOW?* (2007); MATTHEW ROTHMAN, LEHMAN BROS. RESEARCH, *U.S. EQUITY QUANTITATIVE STRATEGIES: REBALANCE OF LARGE CAP QUANT PORTFOLIO* (2007); MATTHEW ROTHMAN, LEHMAN BROS. EQUITY RESEARCH, *U.S. EQUITY QUANTITATIVE STRATEGIES: TURBULENT TIMES IN QUANT LAND* (2007); Kent Daniel, *Anatomy of a Crisis*, 26 CFA INST. CONF. PROC. Q. 11 (2009); Khandani & Lo, *supra* note 26; Khandani & Lo, *supra* note 29; James Montier, *The Myth of Exogenous Risk and the Recent Quant Problems*, BEHAV. INV. BLOG (Sep. 24, 2007), <http://behaviouralinvesting.blogspot.com/2007/09/myth-of-exogenous-risk-and-recent-quant.html>.

50. Specifically, on February 27, 2007 the Federal Home Loan Mortgage Corporation (Freddie Mac) discontinued its purchases of the most risky subprime mortgages and mortgage-related securities. Press Release, Freddie Mac, *Freddie Mac Announces Tougher Subprime Lending Standards to Help Reduce the Risk of Future Borrower Debt* (Feb. 27, 2007). On April 2, 2007, New Century Financial Corporation, a leading subprime mortgage lender, filed for Chapter 11 bankruptcy protection. News Release, New Century Fin. Co., *New Century Financial Corporation Files for Chapter 11; Announces Agreement to Sell Servicing Operations* (Apr. 2, 2007). On June 1, 2007, the two largest bond-rating agencies—Standard and Poor’s and Moody’s Investor Services—downgraded over 100 bonds backed by second-lien subprime mortgages. See *The Role of Credit Rating Agencies in the Structured Finance Market: Hearing Before the Subcomm. on Capital Mkts. Ins. and Gov’t Sponsored Enters.’s of the H. Comm. on Fin. Serv.’s*, 110th Cong. 147 (2007) (statement of Vickie A. Tillman, Exec. Vice President, Standard & Poor’s).

51. Bear Stearns was ultimately denied Chapter 15 bankruptcy protection for these two funds. Bruce Nathan & Richard Corbi, *Overseas Bear Stearns Hedge Funds Denied Chapter 15 Relief*, BUS. CREDIT, July/Aug. 2008, at 2, 4.

52. See Khandani & Lo, *supra* note 26, at 5.

prices of various securities so as to generate losses for itself and other funds with similarly constructed portfolios. As these losses were realized each day, portfolio managers and their investors grew more nervous, motivating further liquidations that caused greater losses. The unwinding of positions was also likely prompted by the need to avoid exceeding applicable leverage constraints and margin requirements as losses increased. This vicious cycle played itself out from August 6th to 9th, and reversed itself abruptly starting on August 10th, apparently after Goldman Sachs committed \$3 billion of additional capital to support its hard-hit Global Equity Opportunities Fund.<sup>53</sup> In the aftermath of this Quant Meltdown, many equity market neutral hedge funds closed down permanently, assets fled to other strategies and safer havens<sup>54</sup> and by the end of 2007, stock market volatility had nearly doubled.

However, in the years since the Financial Crisis of 2007-2009, equity market volatility has declined to pre-Crisis levels,<sup>55</sup> which may very well restart the volatility/leverage cycle once again. Of course, aggregate leverage in financial markets is considerably lower today than in the early 2000s, and the economic climate is considerably less certain, especially for financial institutions. Therefore, a return to a lower-volatility environment does not necessarily imply that quantitative equity market neutral funds will now return to their pre-Crisis levels as well. One reason is that new forms of market-neutral strategies have emerged, e.g., high frequency trading, and given the current market climate and the greater limitations of broker/dealer leverage today as compared to a decade ago, these new strategies are more profitable and less risky than the less technologically sophisticated and slower-moving equity market neutral counterparts.

These considerations underscore the impact that the volatility-leverage feedback loop can have even with exchanged-traded securities in markets that are considered among the most liquid in the world. They also demonstrate the need for dynamic leverage regulation that takes into account feedback effects and the endogeneity of volatility to the regulated financial system. Such regulation would ideally have been able to adjust flexibly and would have required fewer firms to unwind positions so quickly, which in turn may have avoided the extreme level of observed volatility.

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53. See Sender, Kelly & Zuckerman, *supra* note 47.

54. See *supra* Figure 6.

55. See *infra* Figure 10.

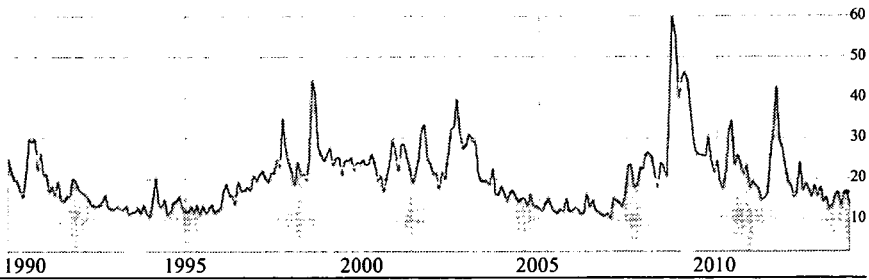


Figure 10. Daily VIX Index from January 2, 1990 to November 1, 2013.<sup>56</sup>

## VII. Conclusion

Dynamic loss probabilities in financial markets pose a significant challenge for traditional financial regulation. Unless regulations are sufficiently adaptive to changing economic conditions, they may not be able to perform the role expected of them. As our foreign-exchange example illustrates, neither volatility nor correlation is stable over time, even for very broadly traded assets such as the currencies of major countries. The SPAN system of the CME provides an informative example of how the private sector has addressed some of these dynamics. However, the challenges to macroprudential regulation are significantly more complex because they must address the endogeneity of systemic risk, and also deal with assets that are much less liquid and difficult to price than those of the CME.

Moreover, the empirical properties of the equity mean-reversion trading strategy illustrate the complexity that volatility/leverage feedback loops can pose for regulators, both because of their ability to amplify shocks and their potential impact on aggregate market risk levels. When such strategies trip leverage limits, rapid unwinding and price instability can occur, as it did for the quants in August 2007.

These examples, and the enormous corpus of new regulations mandated by the Dodd-Frank Act of 2010, underscore the growing recognition that measuring and managing systemic risk now involves far more than the traditional banking industry. Our regulatory infrastructure thus needs to be modernized. There is clear consensus among economists, financial industry leaders, regulators, and policymakers that, like national defense, education, and the environment, financial stability is a public good. Therefore, the case for the utility of macroprudential regulation is not controversial. However, the precise form that such regulation should take is highly controversial, largely because we do not yet have a clear scientific understanding of the mechanisms by

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56. *Volatility S&P 500 (^VIX)*, YAHOO! FINANCE, <http://finance.yahoo.com/q?s=%5EVIX> (last visited Dec. 14, 2013).

which systemic risk is generated and can be moderated. Dynamic loss probabilities are an attempt to provide such scientific foundations.

Addressing the challenges of dynamic loss probabilities is no simple task, and will require a new approach to financial regulation, one that is capable not only of adapting to changing economic conditions but that also properly accounts for its own impact on the behavior of regulated entities. The volatility/leverage feedback loop is only one of many examples of complex adaptive behavior, and new research will likely be needed to create the necessary tools for regulating such systems. Rather than choosing between “clear bright lines” and “balancing tests,” a more sophisticated type of regulation might be developed in which balancing tests are formulated via “clear bright principles” such as the objective of constraining loss probabilities to some fixed upper bound. Inventing new forms of regulation will undoubtedly require close collaboration among legal scholars, practicing lawyers, and financial economists, and we hope the analysis in this Article provides sufficient motivation for these collaborations.

# Are Any Creditors “Particularly Deserving”?: On the Enduring Attraction of the Ring-Fence Approach to Cross-Border Insolvencies of Financial Institutions

Jonathan Macey†

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## I. Introduction

Academics and policy-makers often argue for a harmonized international system to resolve the failures of large international financial institutions in order to reduce both systemic risk and the probability that an insolvency of a major bank will lead to a global economic collapse.<sup>1</sup> Despite the perceived need for international coordination, major obstacles remain.<sup>2</sup> The persistent failure to achieve any meaningful degree of international cooperation among regulators and lawmakers to handle failures of global financial institutions represents a perplexing island of discord in what is otherwise an ocean of international regulatory harmony. That is, there tends to be abundant international cooperation in the global financial sector and, ostensibly, increasing levels of international cooperation in banking regulation is a fundamental goal of U.S. national policy.<sup>3</sup> One scholar recently observed, “there is extensive international regulatory co-operation in financial services regulation, co-ordinated through several global regulatory committees.”

Moreover, banks in the United States, along with banks in virtually every other country in the developed world, are regulated by a “global regulatory

1. Charles Hendren, *Judicial and Administrative Approaches to Bank Resolution: Prospects for International Harmonization*, (Univ. of Penn., The Wharton Sch., Fin. Inst. Ctr., Working Paper No. 11-73), <http://fic.wharton.upenn.edu/fic/papers/11/p1173.htm>:

The financial crisis of 2007-08 brought the world economy to the brink of collapse. If policy-makers hope to avoid a repeat of these events, they must design and implement enhanced procedures for resolving systemically important financial institutions. Doing so is challenging enough at the national level, with the rise of complex financial groups; however, the increased internationalization of financial activity in recent years presents an even more difficult set of problems at the global level. Effectively resolving cross-border financial institutions will require, at a minimum, the harmonization of bank resolution procedures across core countries.

*Id.* at abstract.

2. Among the remaining obstacles are: (1) adopting effective statutory resolution regimes in other countries; (2) ensuring systemic global banking firms have sufficient “gone concern” loss-absorption capacity; (3) completing firm-specific cooperation agreements with foreign regulators that provide credible assurances to those host-country regulators to forestall disruptive ring-fencing; and (4) coordinating consistent treatment of cross-border financial contracts. *Cross-Border Resolution, Hearing Before the Subcomm. on Nat’l Sec. and Int’l Trade and Fin. of the S. Comm. on Banking, Housing, and Urban Affairs*, 113th Cong. (2013) (statement of Michael S. Gibson, Dir., Div. of Banking Supervision and Regulation)(transcript available at) <http://www.federalreserve.gov/newsevents/testimony/gibson20130515a.htm>

3. See The DEPARTMENT OF THE TREASURY, *A New Foundation: Rebuilding Financial Supervision and Regulation*, <http://online.wsj.com/public/resources/documents/finregfinal06172009.pdf>; see also Edward F. Greene, *Dodd-Frank and the Future of Financial Regulation*, 2 HARV. BUS. L. REV. ONLINE 79 (2011) (“Given the reality that major financial institutions increasingly conduct significant portions of their business in many different countries, consistency and cooperation are essential, especially between the US and the EU.”); Allen N. Berger, Qinglei Dai, Steven Ongena, & David C. Smith, *To What Extent Will the Banking Industry be Globalized? A Study of Bank Nationality and Reach in 20 European Nations*, (Bd. of Governors of Fed. Reserve Sys., Int’l Fin. Discussion Paper No. 725, 2002), <http://www.federalreserve.gov/pubs/ifdp/2002/725/ifdp725.pdf>.

regime” known as the Basel bank capital standards.<sup>4</sup> Hundreds of countries have adopted these standards, as well as the numerous regulatory ‘guidelines’ promulgated by the Bank for International Settlements (BIS) that specify how regulatory authority over banks is to be divided among various home and host country authorities. The level of cooperation is such that many countries have established bilateral agreements in the form of Memoranda of Understanding that specify how information exchange should be organized.<sup>5</sup> <sup>6</sup> International agreement, thus, specifies the most important safety and soundness rules, which concern how much capital a bank must have in order to operate and how the supervisory authority over financial institutions’ cross-border operations is to be allocated.

Despite all of this and our vast experience with international banks’ failures, reaching agreement on how to resolve the failure of large financial institutions with significant transnational assets and liabilities has proved elusive.<sup>7</sup> And there does not seem to be much hope for the future: as Federal Reserve Board Governor Daniel K. Tarullo observed in the wake of the Financial Crisis, “comprehensive solutions to cross-border crisis management ‘will not be easy to achieve.’”<sup>8</sup>

Oddly, the extant literature on systemic bank failure begins with the unexamined premise that greater coordination in resolving cross-border bank failures is an obvious regulatory goal whose costs are outweighed by the apparently significant benefits of such coordination. Little attention has been paid to either the descriptive question of why the goal of achieving international cooperation has been so elusive or to possible strategies to enhance the probability of achieving greater global cooperation.<sup>9</sup>

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4. Peter Wallison, *How Regulators Herded Banks into Trouble*, WALL ST. J., Dec. 3, 2011, <http://online.wsj.com/article/SB10001424052970203833104577069911633739768.html>.

5. Cornelia Holthausen & Thomas Rønde, *Cooperation in International Banking Supervision*, (European Cent. Bank Working Paper No. 316, 2004), <http://ideas.repec.org/p/ecb/ecbwps/20040316.html>.

6. See Julia Black, *Prudential Regulation of Banks*, in 2 INTERNATIONAL REGULATORY CO-OPERATION: CASE STUDIES, CANADA-US CO-OPERATION, EU ENERGY REGULATION, RISK ASSESSMENT AND BANKING SUPERVISION 69 (2013), <http://dx.doi.org/10.1787/9789264200500-6-en>.

7. The fact that we still have new proposals to stop another Lehman reflects the elusiveness of regulatory cooperation. See *BIS Lays Out "Simple" Plan for How to Handle Bank Failures*, June 2, 2013, REUTERS, <http://www.reuters.com/article/2013/06/02/us-banks-recapitalisation-bis-idUSBRE9510CO20130602>, accessed August 14, 2013.

8. *International Cooperation and Financial Regulatory Modernization Before the Subcomm. on Sec. and Int'l Trade and Fin. of the S. Comm. on Banking, Housing, and Urban Affairs*, 111th Cong. (2010) (statement of Daniel K. Tarullo, Member, Bd. of Governors, Fed. Reserve Sys.) (transcript available at <http://www.federalreserve.gov/newsevents/testimony/tarullo20100720a.htm>)

9. See Rosa Lastra, *Cross-border Bank Insolvency*, EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT, <http://nowandfutures.com/d2/CrossBorderBankInsolvency.pdf>, at 7 (assuming the need for international coordination in resolving cross-border bank insolvencies, pointing out that “[t]he need for a coordinated liquidation of multinational banks would best be served by the adoption of an international convention . . . based on . . . Universality”).

This Article makes two principal observations. First, as a descriptive matter, I argue that regardless of the merits of greater global regulatory harmony in the resolution of failed financial institutions, regulators do not have the same incentives to harmonize their bank failure resolution procedures that they have to harmonize in other areas, such as bank capitalization or on-going supervision of solvent banks to monitor their risk-taking activities.<sup>10</sup> When resolving bank failures, both the United States and creditors of failed banks that settle international transactions in the United States benefit under the current system. My second observation is that a more promising approach that would enjoy broad international cooperation would be to, *ex ante*, rank all the creditors of failed banks, with highest priority given to particularly deserving small retail creditors.

The United States, which is winning under the current, balkanized system, in the sense that it often has control of a disproportionately high percentage of the assets of failed global financial institutions, has a strong incentive to keep the ring-fence system of non-cooperation intact, unless moving to a new system would leave them with control of even more assets. Since the assets and liabilities of an insolvent financial institution are fixed on the moment of insolvency, any scheme that resulted in more bank assets being under U.S. control necessarily would leave fewer assets under the control of non-U.S. regulatory authorities. In other words, the policy choice between a ring-fence approach and a coordinated or cooperative approach is zero-sum, and therefore the fight is about the distribution of assets and power. Under a realist paradigm (which I adopt), any approach that made the United States better off would not be acceptable to those countries made worse off under such an approach. The fact that well-organized, entrenched creditor-groups (including the U.S. government) benefit from the current system at the expense of widely dispersed, uncoordinated groups of claimants makes international cooperation even less likely because the groups with the most political clout and influence do not favor change antithetical to their economic interests.

By way of illustration, I explore the history of the failure of the global financial firm the Bank of Credit and Commerce International (BCCI). It provides an object lesson in the way that the benefits and costs of the current system are allocated. In this insolvency, U.S. creditors were paid in full and the U.S. government collected an “exit fee” of over \$200 million in BCCI assets, while thousands of economically underprivileged depositors both in the United Kingdom and Southeast Asia received only a fraction of what they were owed. While netting and settling through continuous linked settlement (CLS) have

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10. See Aaron Lucchetti, *The Regulator Down the Hall: Fed and Comptroller of Currency Bolster the Ranks of Staffers 'Embedded' at Nation's Biggest Banks*, WALL ST. J., June 20, 2011, <http://online.wsj.com/news/articles/SB10001424052702304763704576394610591065334> (“[A]s part of a push to prevent another financial crisis, the Federal Reserve Bank of New York and the Office of the Comptroller of the Currency are increasing the number of examiners who go to work every day at the companies they regulate.”).



mitigated many of the problems related to foreign exchange trading,<sup>11</sup> the core problem is one of regulatory opportunism, rather than technical problems in global clearing and settlement. The opportunism problem has not even been addressed, much less resolved, over the past several decades. Thus, it is not surprising that international regulatory cooperation has been so elusive.

When arguing that regulators do not have the same incentives to harmonize their bank failure resolution procedures that they have to harmonize in other areas, I challenge the assumption that internationally coordinated cross-border resolutions of bank failures will necessarily be qualitatively better than the current, rather anarchic state-by-state process that one observes today.<sup>12</sup> Internationally coordinated cross-border resolutions of financial institutions' failures may sometimes be better than ad hoc country-specific approaches, from the point of view of basic fairness to creditors. In virtually every case, some creditors of a failed institution will be better off if the failure of a particular financial institution was resolved in a coordinated fashion, while others would be worse off.

Consistent with previous work,<sup>13</sup> and following in the tradition of Anthony Downs,<sup>14</sup> I adopt the *a priori* assumption that bureaucracies are self-interested actors. Similarly, following the realist paradigm in international

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11. CLS is a group of companies, all of which are subsidiaries of CLS Group Holdings AG. CLS Group Holdings AG is incorporated in Switzerland and is regulated by the US Federal Reserve as if it were a bank holding company. CLS Group Holdings AG (CLS) is owned by CLS shareholders, which include major financial institutions such as AIG and JPMorgan Chase. CLS links central banks with the world's leading financial institutions in a unique global settlement system. CLS settles payment instructions relating to FX spot, FX forward, FX swap and over-the-counter (OTC) credit derivatives transactions. Participants can access the settlement service either directly (as a Settlement Member) or indirectly (through Settlement Members providing access to third parties). See *CLS Keeps the Market Safe from Settlement Risk ut Needs to Add More Currencies*, THE ECONOMIST, Sept. 21, 2013, <http://www.economist.com/news/finance-and-economics/21586540-cls-keeps-market-safe-settlement-risk-needs-add-more>; Gabriel Galati, *Settlement Risk in Foreign Exchange Markets and CLS Bank*, BIS QUARTERLY REVIEW, Dec. 2002, at 55-66, [http://www.bis.org/publ/qtrpdf/r\\_qt0212f.pdf](http://www.bis.org/publ/qtrpdf/r_qt0212f.pdf).

12. Generally speaking, a qualitatively superior bankruptcy regime is one that produces results more closely aligned with creditors' ex ante expectations as those expectations are informed by applicable legal rules and contractual agreements. This concept generally is known as creditors' protection. In other words, a bankruptcy regime is qualitatively better if it generates outcomes more consistent with creditor's legitimate, i.e. contract-based expectations. A bankruptcy regime is quantitatively better if it generates the outcome that maximizes the size of the bankrupt entity's estate. For example, a relevant factor in evaluating the quantitative efficiency of a bankruptcy regime is the extent to which a particular bankruptcy regime minimizes the transactions costs associated with effectuating the resolution of the failed firms subject to the bankruptcy process. See Alan Schwartz, *A Theory of Loan Priorities*, 18 J. LEGAL STUD., 209 (1989); Thomas Jackson, *Bankruptcy, Non-Bankruptcy Entitlements, and the Creditors' Bargain*, 91 YALE L.J. 857 (1982); Frank H. Easterbrook, *Is Corporate Bankruptcy Efficient?*, 27 J. FIN. ECON. 411(1990).

13. Jonathan Macey, *Regulatory Globalization as a Response to Regulatory Competition*, 52 EMORY L.J. 1353 (2003).

14. ANTHONY DOWNS, *INSIDE BUREAUCRACY* (1967) (arguing that bureaucrats are rational, self-interested utility maximizers instead of preference-free altruistic public servants).

relations theory, I also adopt the *a priori* assumption that nation-states act self-interestedly.<sup>15</sup>

In place of the current, top-down conversation which focuses on abstract ideas of corporate form and corporate governance, the conversation should revolve around which particular creditors, or classes of creditors, regardless of their physical location, are most deserving of priority distributions and which should be relegated towards the rear of the queue. Changing the terms of the discourse to reflect this important distinction should increase the chances of attaining a better policy outcome because it would reveal benefits of international cooperation that have not been appreciated up to this point.

In my proposal to resolve international bank failures, instead of arguing in the abstract about whether there should be a purely global rather than a purely local approach to bank failures, I argue that individual nation-states should adopt a hybrid approach. Under it, local regulators could agree on a case-by-case basis whether to do what is known as “ring-fence” the assets and liabilities of a failed bank located in their jurisdictions.<sup>16</sup> However, in situations in which local regulators choose to utilize a ring-fence approach to resolving a bank failure, the local regulators should be required to give priority status to certain creditors, regardless of where those creditors are located. Specifically, my approach would favor small, uninsured retail creditors and require that those creditors receive payment before local creditors. I call this the “particularly deserving creditor” approach. This would sometimes require local regulators to participate in global bankruptcies to a limited extent (in contrast to the all-or-nothing participation required under current approaches to the cross-border bank failure problem).

This Article proceeds as follows: Part I contains a summary of the expected costs and benefits of cross-border resolution process, followed by a discussion of the economic and political forces that explain why, regardless of the efficiency arguments, achieving a functioning cross-border resolution system has been arduous. In Part II, I illustrate the shortcomings of a wholly international, centralized approach to global bank failures. In Part III, I describe the critical features of my hybrid domestic and international approach that

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15. JACK DONNELLY, *The Ethics of Realism*, in THE OXFORD HANDBOOK OF INTERNATIONAL RELATIONS 150 (2008); Richard Russell, *American Diplomatic Realism: A Tradition Practised and Preached by George F. Kennan*, 11 DIPLOMACY AND STATECRAFT 159, 159-83.

16. Ring-fencing describes the practice of cordoning off and freezing the assets and liabilities of a failed company in a particular jurisdiction and then treating these assets and liabilities separately from the company's assets and liabilities in other jurisdictions. As one commentator has observed, “[t]he purpose of ring-fencing is to ensure that assets in a particular jurisdiction actually receive special protection at the expense of others. Essentially the aim is to ensure that local creditors receive preferential treatment over foreign creditors.” Andrew Campbell, *Issues in Cross-Border Bank Insolvency: The European Community Directive on the Reorganization and Winding-Up of Credit Institutions*, <http://www.imf.org/external/np/leg/sem/2002/cdmf/eng/campb.pdf>; see also T. ASSER, THE LEGAL ASPECTS OF REGULATORY TREATMENT OF BANKS IN DISTRESS (2001); M. GIOVANOLI & G. HEINRICH, INTERNATIONAL BANK INSOLVENCIES: A CENTRAL BANK PERSPECTIVE (1999).

might be politically attainable despite the practical obstacles to international agreements described in Part I. A conclusion follows.

## I. The Reasons for the Island of Discord

### *A. How Bank Failures Are Resolved*

Before expounding upon the reasons for lackluster international cooperation to resolve the failure of international banks, it is important to understand the typical resolution process when these institutions fail. The typical governance response to a failed bank has four components. First, regulators declare the bank to be insolvent and appoint a receiver to take control of it.<sup>17</sup> In the United States, the Federal Deposit Insurance Corporation (FDIC) is the receiver of failed banks and failed financial institutions that are deemed systemically important.<sup>18</sup>

Second, the receiver structures the resolution of the bank, choosing from options that range from liquidating the bank, to arranging for a merger with another, more financially sound financial institution, to selling the bank as a going-concern. The receiver makes fundamental decisions about how to dispose of the bank's assets and liabilities. For example, the receiver could sell the assets piecemeal or as a large package and use the proceeds to pay liabilities.<sup>19</sup> Or the receiver could look for a healthy bank willing both to purchase the failed bank's assets and to assume the failed bank's liabilities (thus paying claims in bulk).

Third, the receiver marshals the bank's assets, identifying and collecting on all items of potential value owned by the bank. In this stage of resolving a failed bank, the receiver can invalidate the claims of certain creditors, such as those who have received funds fraudulently from the bank or who have obtained improper preferential treatment over other creditors.<sup>20</sup> The receiver also has the power to terminate contracts and leases that impose ongoing obligations on the bank and to enforce any payment or performance guarantees that the bank has obtained from third parties.<sup>21</sup> The receiver also has the authority to bring suit against officers and directors of the financial institutions whose negligence or wrongdoing were factors in causing the bank's failure.<sup>22</sup>

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17. RICHARD CARNELL, JONATHAN MACEY & GEOFFREY MILLER, *THE LAW OF FINANCIAL INSTITUTIONS* 485 (2013).

18. The Dodd-Frank Act, Pub.L. 111-203, H.R. 4173, (codified as amended at 12 U.S.C. §1821 (c)(4)-(5)) (giving the FDIC the authority to place a failing financial company that has been designated as a systemically important financial institution ("SIFI") by the Financial Stability Oversight Council, whether it is a bank, a bank holding company or a non-bank financial company, into receivership). Other companies are resolved under the Bankruptcy Code.

19. CARNELL ET AL., *supra* note 18, at 499-500.

20. *Id.* at 502.

21. *Id.*

22. *Id.* at 502.

Fourth and finally, the FDIC as receiver determines the validity and priority of claims against the bank and uses the proceeds from the bank's assets to pay the claims that the FDIC deems valid. If those claims exceed the value of bank's assets, as they typically do, the receiver pays creditors in the order of priority prescribed by law (paying deposits first, then ordinary non-deposit claims, then subordinated debt last).<sup>23</sup>

Local regulators only exercise jurisdiction over the financial institutions chartered within their country. Regulators, however, can grab the assets of failed financial institutions over which they have jurisdiction. Where there are multiple resolution processes occurring simultaneously—or where there is a perceived risk that there may be other resolutions processes in the future—regulators often opportunistically grab the local assets of failed financial institutions. These assets will then be available to satisfy the claims of local creditors, and, of course, to satisfy any claims the government might have in the way of uncollected fines, penalties or taxes.

In short, any decisions to coordinate the resolution of a failed financial institution are made on a case-by-case basis by regulators. Regulatory authorities have discretion in this regard. Any decisions to cooperate are voluntary.

### *B. Cross-Border Resolutions: The Economics of the Politics*

As I have pointed out in a previous paper, notwithstanding the enormous complexity of the problem, regulators desire to achieve agreement on how to supervise banks' balance sheets because, in the absence of such an agreement, local regulators would lose both power over the financial institutions they were supposed to regulate as well as their ability to exercise their traditional regulatory authority over banks' capital levels. Regulators were threatened with losing power and autonomy because large financial institutions with significant cross-border operations could render any local capital regulations irrelevant simply by conducting operations through subsidiaries or other corporate affiliates located in jurisdictions with less stringent capital requirements. Even financial institutions without subsidiaries in jurisdictions with more relaxed capital standards could simply establish subsidiaries or affiliates in such jurisdictions.

In other words, regulators have strong incentives to agree to common international rules for capital levels because without such agreement they risk losing much of their ability to regulate at all. Thus, while regulators might prefer to have complete regulatory autonomy, cooperation with other regulators is preferable to having their regulatory power usurped.

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23. *Id.* at 485.

Regulators do not have the same incentives to reach agreement in the field of bank failure resolution, however. Creditors of financial institutions, by definition, are not aware that the financial institutions to which they have lent their money will fail someday. This is axiomatically true, because if the creditors thought that their financial institutions would fail, then they immediately would eliminate this risk by withdrawing their money. In simple terms, because creditors of failed depository institutions are unaware of their status as future creditors of failed depository institutions, they are unable to galvanize into an effective political coalition to push for efficient *ex ante* rules prior to a bank failure. On the other hand, after a financial institution has failed, its uninsured creditors are strongly motivated to exert whatever political or legal pressure they can on regulators to motivate them to use whatever discretion they have to resolve the failed financial institution in the way that will maximize their recovery. For U.S. creditors, this often means that they will exert pressure on regulators to ring-fence the assets and liabilities of the failed institution.

Thus, as I have observed previously, under certain conditions it is far more likely to achieve unified global regulatory solutions than under other conditions. In particular, global regulatory coordination is more likely to emerge when one of the following three conditions is met: (1) when regulatory globalization permits regulators to achieve “regulatory cartelization” by eliminating jurisdictional competition among regulators; (2) “when governmental actors or regulators can increase their power by persuading or forcing other countries to adopt regulations favored by the first country” (I label this “regulatory imperialism”); or (3) when global coordination or cooperation can be used as a “regulatory policy lever,” which happens when “an administrative agency lacks domestic political support for a favored policy” and uses regulatory globalization to make it more difficult for local political rivals to block that policy<sup>24</sup> Under these conditions, regulators have strong incentives to engage in efforts to achieve regulatory globalization.

Examining cross-border bank failures from this perspective, it is easy to see why there has been such a lack of coordination in resolving global bank failures. Simply put, although in other contexts, particularly in the context of achieving global cooperation in setting capital levels for banks, these conditions may exist, they are sorely lacking for any attempt to create a global resolution scheme for bank failures.

The first condition under which we would expect to achieve global regulatory cooperation is when such cooperation allows regulators to achieve “regulatory cartelization” by eliminating jurisdictional competition among regulators. But in the context of bank failure resolution, bank regulators would lose market power rather than gain it by cooperating with other regulators.

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24. *Id.* at 353-54.

Regulators have incentives to cooperate when they can increase their authority by doing so. Regulators tend not to cooperate when it reduces their power and autonomy. For example, when global foreign exchange markets become so large and competitive that the central banks of mid-to-large-size economies, like France or Germany, cannot steer monetary policy because they no longer have the market power necessary to affect the prices of sovereign debt, then they have incentives to cooperate with other central banks to create a regulatory cartel. This explains the emergence of the European Central Bank. The bank is more powerful than the central banks of any individual E.U. member state, which allows local regulators to influence the interest rates in their own countries by lobbying the Central Bank in Frankfurt. While a second-best solution, this cooperation is better for regulators than trying to act individually as they did in the past. In contrast, however, regulators continue to enjoy autonomy and power in the domain of resolving failed financial institutions. As such, regulators would likely lose power rather than gain it by agreeing to resolve failed financial institutions on a global rather than local level.

Second, for the same reason, when it comes to the issue of resolving failures of international financial institutions, regulators are unlikely to be able to increase their power by persuading or compelling other countries to adopt regulations favored by the first country. “Regulatory imperialism,” then, is not an avenue to international cooperation in this space. This is because, unlike in certain other areas such as the regulation of banks’ capital levels, the financial institutions regulated by a particular local regulator have no incentives to relocate to other jurisdictions to take advantage of what they might deem to be superior regulation. This is because, by definition, the equity claimants of failed financial institutions generally lose their equity interests when these institutions fail. And, to the extent that shareholders have a chance of retaining an economic interest in a reorganized financial institution or in profiting from the sale of an economically troubled financial institution, these shareholders are likely to fare much better if their financial institution is resolved by local regulators—who may be influenced and even captured by the shareholders of the failed institutions—than by distant regulators over whom they are unlikely to have much influence.

Third and finally, while it is the case that global coordination or cooperation can be used as a “regulatory policy lever” by regulators who lack domestic political support for a favored policy, this strategy only works where regulators in one country can claim that there is such a strong international consensus in favor of the regulations they prefer that the country risks being ostracized unless the groups at home accede to new rules. In other words, sometimes regulators can use regulatory globalization to make it more difficult for local political rivals to block that policy. The negotiations over the Basel capital accords provide a good example of this phenomenon. Regulators from Japan, who wanted to impose stricter capital requirements on failed banks but did not have the domestic support to do so, were able to achieve the enactment

of such stricter capital requirements by asserting that if Japan failed to agree to these requirements, it risked becoming subject to the sanctions that likely would be imposed upon financial institutions in regimes that did not adopt the relatively strict accords.<sup>25</sup> In contrast, cooperating on a global basis to homogenize the rules concerning bank failure will not enable any particular regime to leverage its local authority, which, of course, already extends to resolving failed financial institutions.

In a nutshell, then, we tend to observe regulatory cooperation when interest groups and regulators benefit from such cooperation. We tend to observe an absence of it when it would reduce the power of interest groups and regulators. As it happens, the resolution of cross-border financial institutions falls into the latter category. The beneficiaries are the particular sub-set of creditors who would benefit more from a coordinated, cross-border approach to bankruptcy, but this set of creditors is an amorphous and unidentified (indeed unidentifiable) group that has no prospect of galvanizing into an effective political coalition to press for change.

### *C. Cross-Border Resolutions: Qui Bono*

Two unexamined assumptions about the cross-border resolution of failed banks permeate much thinking on the subject. The first assumption is that international coordination for resolving failed banks on a world-wide basis is the desired policy outcome; that is, one that always is preferred to the alternative of ring-fencing the assets and liabilities of insolvent financial institutions and allowing each jurisdiction affected by the failure to resolve such failures individually. The ring-fence approach to resolving failed banks is thought to display poor international citizenship and to generate generally unspecified ‘bad’ policy outcomes. For example, the Financial Stability Board, which includes among its members the IMF, World Bank, Board of Governors of the U.S. Federal Reserve System, and the Banks of Canada, China, England, France, Italy, and Russia<sup>26</sup> has proclaimed that “any financial institution that could be systemically significant or critical if it fails should be subject to a resolution regime that [makes them] the subject of institution-specific cross-border cooperation agreements.”<sup>27</sup> The international consensus is that “the statutory mandate of a resolution authority should empower and strongly encourage the authority wherever possible to act to achieve a cooperative solution with foreign resolution authorities.”<sup>28</sup> Similarly, “cross-border cooperation agreements should help facilitate institution-specific crisis

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25. *Id.* at 1372-75.

26. <http://www.financialstabilityboard.org/members/links.htm>.

27. Financial Stability Board, *Key Attributes of Effective Resolution Regimes for Financial Institutions*, (Nov. 4, 2011), [http://www.financialstabilityboard.org/publications/r\\_111104cc.htm](http://www.financialstabilityboard.org/publications/r_111104cc.htm); see also Michael S. Gibson, *supra* note 2.

28. Financial Stability Board, *supra* note 27 at 15.

management planning and cooperation between relevant authorities, with a *presumption in favor of cooperation* in the event of the firm's resolution."<sup>29</sup>

A second unexamined assumption embraced by commentators and regulators is that the historic and ongoing lack of meaningful cross-border cooperation in the case of bank failures is due to failures of diplomacy or to cultural misunderstandings that prevent countries from reaching agreement. The point here is that those who say that we should have cross-border cooperation because such cooperation would lead to better outcomes fail to explain why we cannot seem to achieve this outcome. In other words, it simply is assumed that international coordination is desirable (the first assumption), and that some unspecified failure of regulatory diplomatic zeal is all that stands in the way of achieving a regulatory regime based on such international coordination (the second assumption).

But I think it is misguided to speak in such absolutes. Sometimes a country-by-country approach will be better than a coordinated approach where "better" is defined as capturing a larger pool of assets for distribution to the claimants of a particular failed institution before they can be dissipated by the bank. It is also clear that certain claimants to the assets of a financial institution will be better off with a jurisdiction-by-jurisdiction approach than with a global, borderless approach. The BCCI bankruptcy is an object lesson in how a jurisdiction-by-jurisdiction approach benefits the creditors in some countries at the expense of others.

My second point is that the chronic inability of the international community to reach agreement to require cross-border resolutions of failed financial institutions, while not conclusive, does at least suggest that the benefits from reaching such an agreement are not significantly greater than the costs. From a simple bargaining perspective, the international community's persistent inability to reach agreement to coordinate cross-border bank failures suggests that such agreements are expected to generate relatively small benefits in relation to the benefits currently realized under the status quo. This is because if the benefits were orders of magnitude greater than the costs, then whatever frictions are preventing states from reaching a binding consensus would be overcome because the gains to the winners would be sufficiently greater than the losses to the losers that the winners could compensate the losers for their losses and still be better off than they would have been under the status quo. In other words, if an internationally coordinated resolution system were actually more efficient than the current jurisdiction-by-jurisdiction approach, it would be likely that an international resolution scheme could be achieved quite easily. Here, I mean efficient in the Pareto sense of making some creditors better off without making others worse off.<sup>30</sup>

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29. *Id.* at 23 (emphasis added).

30. See Mikhael Shor, Pareto Optimal, [http://www.gametheory.net/dictionary/url\\_of\\_entry.html](http://www.gametheory.net/dictionary/url_of_entry.html) (last visited Sept. 13, 2013).



A Coasian analysis leads to the prediction that if the total amount recovered for creditors and other claimants in insolvency was expected to be highest in a borderless coordinated resolution, parties would bargain to achieve this result. Following this line of thought, here I claim that the failure to cooperate is due primarily to the fact that there not a significant amount to be gained from a comprehensive international regulatory framework on bank failures. To understand why, I now discuss the primary goal of the bankruptcy resolution process—fairness—and how a without-exception international approach to it will not generally accomplish this goal.

*D. The Primary Goal of Bankruptcy Resolution Processes: Fairness*

While bankruptcy laws differ among nations in important respects, a general goal of bankruptcy policy is to achieve an orderly resolution of a failed economic enterprise and to deter the “race for assets”<sup>31</sup> among creditors in order to promote “equality of distribution among similarly situated creditors.”<sup>32</sup> Since, by definition, a bankrupt financial institution does not have sufficient assets to meet the demands of all legally entitled or eligible claimants to those assets, some mechanism for allocating what assets remain should exist. A properly functioning failure resolution mechanism for financial institutions should not favor the strong or politically connected over the weak. Similarly, the mechanism should not favor claimants who are sophisticated or possess inside information because this would be unfair.

The “race for assets” is shorthand for the prisoner’s dilemma that faces the creditors of insolvent companies.<sup>33</sup> Despite the fact that all creditors when viewed in the aggregate would benefit by shepherding the assets of the public company so as to maximize their value, individual creditors can benefit themselves at the expense of the collective by rushing in to plunder particular assets as compensation for their claim against the debtor. Those who strike

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31. Morris Macey, *Preferences and Fraudulent Transfers Under the Bankruptcy Reform Act of 1978*, 28 EMORY L.J. 685, 685 (1979). Another goal of bankruptcy law, at least under the reorganization provisions in Chapter 11 of the U.S. Bankruptcy Code is to give debtors a “fresh start” in business after reorganizing their businesses and re-setting the terms of their obligations to creditors. U.S. bankruptcy law has been criticized as being too lenient on companies. Other countries, particularly France, France’s insolvency process also has been criticized as being tilted too much towards companies and jobs, and affording too little influence to the creditors of failed companies. In Britain, insolvency usually results in liquidation. Despite these differences, all countries share the public policy goal of efficiently resolving the debtor’s estate. *European Bankruptcy Laws: Out of Pocket*, THE ECONOMIST (Dec. 30, 2008), <http://www.economist.com/node/12855376>; Michelle White, *The Costs of Corporate Bankruptcy: A U.S.-European Comparison*, in JAGDEEP BHANDARI AND LAWRENCE WEISS, CORPORATE BANKRUPTCY 467 (1996).

32. *Id.*

33. The prisoner’s dilemma is the name for the collective action problem that faces groups of people who must make decisions simultaneously but without being able to observe the decisions made by the other people in the group. The point of the prisoner’s dilemma is to demonstrate the fact that in group decision-making a conflict sometimes exists between the decision that is best for the individual and the decision that is best for the group. Robert Axelrod, *The Emergence of Cooperation Among Egoists*, 75 AM. POL. SCI. REV. 75, 306-318 (1981).

earliest to grab at the assets of a troubled company, financial or otherwise, are rewarded with a disproportionately large share of the debtor's estate. Those who lag behind will receive only what is leftover, which is often nothing. Most troubling is that many of those who lag behind have legal entitlements to the assets that are superior to, or at the same priority as, the creditors who rushed into grab assets.

This prisoner's dilemma creates incentives for this "me-first" behavior that tends to lead to a premature rush among creditors for the assets of a bankrupt estate. In the banking context these incentives lead to bank runs as depositors, swap counterparties and other creditors rush to eliminate their credit exposure to the firm and to remove their cash and reallocate it to lower risk repositories. In fact, the pressure to move quickly can even lead to runs on banks that are solvent because it is less risky and far cheaper for depositors and other creditors to remove their money from banks that are even *rumored* to be in financial difficulty, much less financial distress.

On the other hand—and this is a critical point of this Article and one that is not fully appreciated by participants in the current debate—while *creditors* have strong incentives to move too quickly in response to rumors, the same is not true for *regulators*. Au contraire, regulators have strong bureaucratic incentives to move too slowly. This may impose severe costs on the economies in which failed banks operate for several reasons, the most important of which is that the losses experienced by failed banks inevitably mushroom as such banks' assets dwindle in proportion to their liabilities, but regulators, loathe to suffer the political fallout associated with bank failures and bailouts, inevitably will fiddle while banks' assets burn. Often, as we saw in the most recent crisis, the fire may become too big to control and too costly to contain.

One insight of this Article is that the incentives for regulators to move too slowly will be exacerbated as the power to shut banks down becomes more centralized. As such, consolidating the resolution process for failed financial institutions, in my view, will not necessarily deter the "race for assets" among creditors that would otherwise occur under the piecemeal collection rules of local jurisdictions, and it likely will make such a race even worse. Regulators may move even more slowly under a consolidated approach to international insolvency, as they will no longer face any pressure to close firms quickly to avoid having assets transferred to different jurisdictions in which the failed bank may have solvent affiliates. A centralized failure resolution process effectuated through cross-border agreements among bank regulators will also not deter individual creditors from racing to grab assets in anticipation of a problem with a bank.

Recognizing the threat posed by the race to assets, especially to uninsured or unsophisticated creditors that lag behind, most countries' bankruptcy laws have an explicit fairness objective. This is often expressed as the goal of

promoting “equality of distribution among similarly situated creditors.”<sup>34</sup> It is unclear whether more international cooperation would make the resolution of vast multi-national financial institutions fairer because no amount regulatory coordination can alter the fact that international financial institutions are remarkably complex.<sup>35</sup> There are economic reasons for this complexity, such as tax avoidance, regulatory arbitrage, and asset partitioning.<sup>36</sup>

Commentators in favor of a more international and less parochial approach to resolving bank failures can point to a number of extremely high profile events that demonstrate the manifest unfairness that have resulted from resolving bank failures on an individual basis. I believe that the bankruptcies of Lehman Brothers and BCCI are two of many such examples.

### 1. Lehman Brothers

When Lehman Brothers failed, it was a “truly global firm with over 7,000 legal entities in more than 40 countries.” Lehman’s insolvency “resulted in over 75 separate and distinct bankruptcy proceedings,”<sup>37</sup> reflecting the scope of Lehman’s operations as well as the large number of distinct legal entities operating under the Lehman umbrella.<sup>38</sup>

Lehman’s non-U.S. entities that filed for bankruptcy along with Lehman could have filed petitions in U.S. courts under the framework provided by Chapter 15 of the Bankruptcy Code (“the Code”), whereby a debtor may file a plenary proceeding in one jurisdiction and seek recognition from United States’ courts.<sup>39</sup> Lehman’s non-U.S. entities, however, pursued an alternative strategy. Hoping to avoid the liquidation of its broker-dealer units, as contemplated by Chapter 7 of the Code, Lehman filed under Chapter 11 for only its holding company. This kept its broker-dealer subsidiary out of bankruptcy until it had time to move all of the customer accounts.<sup>40</sup>

It is important to note, that, as one might expect, the crucial maneuvering occurred before Lehman’s formal bankruptcy filing. Mere hours before the

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34. See RICHARD F. DUNCAN, WILLIAM H. LYONS & CATHERINE LEE WILSON, *THE LAW AND PRACTICE OF SECURED TRANSACTIONS: WORKING WITH ARTICLE 9* §§ 8.04[2], 8-13, (describing “equality of distribution among similarly situated creditors” as the primary purpose of the bankruptcy rules regulating preferential transfers).

35. RICHARD HERRING & JACOPO CARMASSI, *The Corporate Structure of International Financial Conglomerates: Complexity and Its Implications for Safety and Soundness*, in *THE OXFORD HANDBOOK OF BANKING* (2009).

36. See Table 1, *infra*.

37. Press Release, *Lehman Bros. Holdings Inc., Lehman Group of Companies Signs Cross-Border Insolvency Protocol* (May 26, 2009), <http://documents.epiq11.com/ViewDocument.aspx?DocumentPk=400A7F75-7140-4BC3-990E-4B9733B51CF2>

38. *Id.*

39. See 11 U.S.C. §§ 1501-1532 (2006).

40. David A. Skeel, Jr., *Bankruptcy Boundary Games*, 4 *BROOKLYN J. CORP. FIN. & COM. L.* 1, 12 (2009).

company declared bankruptcy on September 15, 2008, as Lehman Brothers sank deeper into insolvency, some of its employees transferred approximately \$8 billion in funds from its London brokerage affiliate to accounts that the firm held in New York.<sup>41</sup> This “transfer left Lehman’s London affiliate with essentially no funds; there weren’t even sufficient resources to pay employees.”<sup>42</sup> In addition, hedge funds and other institutional investors, including U.S. clients of the London subsidiary, were stranded with financial claims on a corporate entity devoid of assets.<sup>43</sup>

While Lehman Brothers was operating at full steam, its London subsidiary made billions of dollars in securities and derivatives trades on behalf of hedge fund clients around the world. Many of these clients preferred to clear their trades in London rather than in New York due to London’s relatively lenient rules for buying securities on margin. These rules allowed Lehman’s clients to borrow more money to finance their trades in London than they could in New York.<sup>44</sup> Lehman had vast amounts of funds in London to support these operations. Lehman’s bankruptcy illustrates just how quickly such assets can be repatriated to the United States when trouble starts.

Lehman’s bankruptcy provided a modern-day example of the ring-fence approach. And, in this important natural experiment, it does not appear that ring-fencing prevented the efficient resolution of the failed firm’s assets. Of course, whether the assets were distributed equitably remains unanswered and rather doubtful.

In addition to the transfer of funds from the United Kingdom to the United States, it turns out that there was significant ring-fencing of Lehman’s Asian assets.<sup>45</sup> Joseph Yam, the CEO of the Hong Kong Monetary Authority (HKMA), testified before a legislative committee of the Hong Kong Legislature established to examine certain aspects of Lehman’s collapse. The committee was particularly interested in the reportedly heavy losses on Lehman structured credit instruments experienced by small, retail investors.<sup>46</sup> Mr. Yam testified that the ring-fencing was done in order “to maintain stability of the city’s banking system and protect the interests of Hong Kong investors.”<sup>47</sup> The HKMA identified nineteen international banks with subsidiaries in Hong Kong,

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41. Christine Cumming & Robert Eisenbeis, *Resolving Troubled Systemically Important Cross-Border Financial Institutions: Is a New Corporate Organizational Form Required?* FEDERAL RESERVE BANK OF NEW YORK, STAFF REPORT NO. 457 at 12 (July, 2010), [www.newyorkfed.org/research/staff\\_reports/sr457.pdf](http://www.newyorkfed.org/research/staff_reports/sr457.pdf).

42. *Id.*

43. *Id.*

44. *Left in Limbo—or Worse—by Lehman*, N.Y. TIMES DEALBOOK BLOG (Oct. 1, 2008), [http://dealbook.nytimes.com/2008/10/01/left-in-limbo-or-worse-by-lehman/?\\_r=0](http://dealbook.nytimes.com/2008/10/01/left-in-limbo-or-worse-by-lehman/?_r=0).

45. Georgina Lee, *HKMA Ring-fenced Assets Before Lehman Collapse*, RISK.NET FINANCIAL RISK MANAGEMENT NEWS AND ANALYSIS (April 15, 2009), <http://www.risk.net/risk-magazine/news/1503976/hkma-ring-fenced-assets-lehman-collapse>.

46. *Id.*

47. *Id.*

put the subsidiary companies on an “intensive monitoring” list, and then ring-fenced their Hong Kong assets in order to make sure that these assets could not be repatriated to their home countries by their non-Hong Kong parents.<sup>48</sup>

Despite the evidence of self-interested ring-fencing in both Europe and Asia, the Lehman bankruptcy, notwithstanding the extent to which it disrupted global markets and unsettled the short-term credit markets, is viewed as something of a success.<sup>49</sup> Lehman quickly sold its North American investment banking business to Barclays and its European, Middle Eastern, and Asian operations to Nomura, the large Japanese investment bank.<sup>50</sup>

## 2. BCCI

The collapse of the mega-bank BCCI provides an even more egregious example of unfairness than Lehman Brothers’ unpaid employees, whose pay packets presumably went into the pockets of such unworthy American creditors as swaps counterparties. The Federal Reserve Bank of New York had inside information regarding when BCCI would be shuttered by foreign regulators.<sup>51</sup> This information was used to the benefit the U.S. creditors and to the detriment of foreign creditors, particularly in Japan and the United Kingdom.<sup>52</sup> For example, as Hal Scott has observed,<sup>53</sup> the Industrial Bank of Japan (IBJ), a major Japanese financial institution, entered into a foreign exchange transaction in which it was exchanging Yen for American dollars. The payout of Yen occurred in Tokyo, while the second leg of the transaction was to occur several hours later because the New York money markets were not yet open after the first leg of the transaction. Unfortunately for IBJ, BCCI was closed on July 5, 1991, after the Tokyo leg of the transaction, but before the New York leg of the transaction had settled. This meant that the IBJ’s counterparty received the Yen it had purchased, but that IBJ was relegated to the position of an unsecured creditor of BCCI for the dollars it had planned to receive in exchange for its delivery of the Yen in the foreign exchange payment.

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48. *Id.*

49. Kenneth Ayotte & David Skeel. *Bankruptcy or Bailouts?* 35 J. CORP. L. 470, 481 (2010) (“[T]he [Lehman] bankruptcy process has been remarkably effective in many respects.”).

50. *Id.* at 481-482.

51. *Hearings Before the Senate Subcommittee on Terrorism, Narcotics and International Operations to Examine Allegations of Drug Trafficking and Money Laundering in the U.S. by the Bank of Credit and Commerce International (BCCI), Focusing on Foreign Policy Implications*, 102d Cong., 1<sup>st</sup> Sess. (1991) (testimony of J. Virgil Mattingly, Jr., General Counsel and William Taylor, Staff Director, respectively, of the Division of Banking Supervision and Regulation of the Board of Governors of the Federal Reserve System) [hereinafter *Testimony on BCCI Drug Trafficking and Money Laundering*].

52. *Id.*

53. Hal Scott, *Supervision of International Banking Post-BCCI*, 8 GA. ST. U. L. REV. 487, 500 (1992). An agency of a bank is simply an office in a foreign country that does business on behalf of its parent bank like issuing international letters of credit and making loans on behalf of their parent.

BCCI had a very modest presence in the United States. It had no U.S. depositors because it had no American branches. Its direct corporate presence in the United States was limited to two uninsured state-licensed “agencies,” one in New York and the other in Los Angeles.<sup>54</sup> These agencies were not allowed to accept deposits from U.S. citizens or U.S. residents and had minimal assets and liabilities.

Largely as a result of actions by the New York Fed that prevented banks involved in clearing and settling the U.S. legs of trades in which BCCI was a counter party, when BCCI was shuttered the bank itself had \$550 million in assets in the United States.<sup>55</sup> Only a small fraction of this amount consisted of assets of BCCI’s New York and Los Angeles agencies.<sup>56</sup> The bulk of the \$550 million was attributable to two sources. First, at the behest of the Fed, banks clearing foreign currency transactions for BCCI accepted payments made to BCCI but did not make payments from BCCI to its counterparties.<sup>57</sup> Second, BCCI was alleged to be the beneficial owner of several U.S. banks, including First American Bank.<sup>58</sup> First American was solvent, and was determined not to have been harmed financially by the insolvency of BCCI—its major, clandestine shareholder.<sup>59</sup>

BCCI’s \$550 million in assets stood in sharp contrast to the bank’s liabilities, which were less than \$20 million to non-BCCI entities.<sup>60</sup> Thus, while BCCI’s liabilities far exceeded its assets on a global basis, the opposite was true in the United States as a result of the U.S. government’s strategy of authorizing payments to BCCI but not from BCCI. Not only were all of BCCI’s U.S. creditors paid in full, but before any of the \$550 million in the bank’s assets were returned to the parallel liquidation proceeding in London, the Federal Reserve Board levied a \$200 million fine against BCCI for using middlemen and failing to disclose its identity when it made certain investments in the United States, particularly the acquisition of First American.<sup>61</sup>

Ultimately, \$275 million of BCCI’s assets went to pay fines to U.S. regulators, to pay U.S. creditors, and to bolster the capital position of the U.S. banks that BCCI was said to own illegally.<sup>62</sup> In stark contrast, BCCI in the

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54. *Id.* at 501.

55. BCCI failed because of massive self-dealing by bank insiders, including significant loans to shareholders who used the bank’s stock as collateral. In addition the bank was essentially a criminal enterprise that engaged in money laundering and other financial crimes on a global scale. On July 5, 1991 customs and bank regulators in seven countries raided the bank and closed its operations. JOSEPH J. TRENTO, *PRELUDE TO TERROR: EDWIN P. WILSON AND THE LEGACY OF AMERICA’S PRIVATE INTELLIGENCE NETWORK* 370 (Carroll & Graf eds., 2005).

56. *Id.* at 502.

57. *Testimony on BCCI Drug Trafficking and Money Laundering*, *supra* note 52.

58. Michael Quinn, *Figuring BCCI’s Effect on First American Bank*, N.Y. TIMES, July 22, 1991, <http://www.nytimes.com/1991/07/22/business/figuring-bcci-s-effect-on-first-american-bank.html>.

59. *Id.*

60. Scott, *supra* note 54, at 502.

61. *Id.*

62. *Id.* at 503.

United Kingdom had 6,500 retail depositors, many of whom were immigrants from India, Bangladesh and Pakistan.<sup>63</sup> After the imposition of American fines and the payouts to U.S. creditors, many of these depositors faced significant financial hardship as a result of BCCI's collapse, as did many small borrowers whose funds were frozen when BCCI's London operations were closed down. After years of waiting, most BCCI depositors eventually got some compensation. For example, clients with less than £20,000 in their accounts received 75% of their deposit's value.

Because of time zone difference, there is extremely limited overlap between the trading day in the United States and the trading days in other financial centers such as Frankfurt, Tokyo, and Hong Kong.<sup>64</sup> New York has only 1.5 hours of overlap with the Frankfurt trading day, and there is no overlap between the trading New York trading day and the trading days in Hong Kong and Tokyo. In every trade where the first leg settles abroad, U.S. authorities have ample opportunity to act opportunistically, as they did in BCCI, by impeding payments in settlement of trades by insolvent banks while permitting collections in settlement of such trades. Whenever this is done, the United States and U.S. creditors can profit from a sort of time zone arbitrage.

## II. The Limits of an International Response

*Lehman* and *BCCI* appear at first blush to provide an object lesson in the virtue of international bankruptcy proceedings and the unfairness of ring-fencing, a distinctly local approach. But such a conclusion would be premature for three reasons, each of which will be considered in the following three subsections.

### A. *The Problem of Fraudulent Conveyances*

First, it is wrong to assume that a consolidated international bankruptcy process could actually solve the fairness issues. It is undeniable that ring-fencing, which is what is done now when institutions fail, generates unfair results in certain cases, with *Lehman* and *BCCI* being two cases in point. But it is far from clear that an alternative system would generate different results.

This is because the unfairness to, say, small retail depositors or employees in the *Lehman* and the *BCCI* bankruptcies were not generated by the piecemeal administration of the bankrupt estates of these firms. The actions taken here were, of course, accomplished prior to the closure (*BCCI*) or bankruptcy filings (*Lehman*) of the affected firms. As such, the fairness problems just described emanated from transfers that occurred prior to bankruptcy, namely preferential

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63. Mary Hennock, *BCCI's Painful Legacy for UK Asians*, BBC NEWS (Jan. 14, 2004), <http://news.bbc.co.uk/2/hi/business/3392703.stm>.

64. See *infra* Table 2.

transfers and fraudulent conveyances. In light of this fact, international agreements about how to resolve distressed, failing and failed financial institutions will not resolve the fairness problem as it is actually experienced, for those problems occur before international regulators would actually begin to manage an insolvency.

The fairness problems identified here would best be solved by having local tribunals, exercising their discretionary (i.e. equity-like) power to avoid particular transactions, which may derive from either an express statutory grant of authority or from common law. The judicial powers required to achieve fairness in bankruptcy, regardless of whether or not the bankrupt firm is a financial institution, are the power of equitable subordination<sup>65</sup> and the power to avoid preferential transfers and fraudulent conveyances.<sup>66</sup> It is easy to see that these rules are intended to promote fairness and prevent results like *Lehman* and *BCCI*. However, it is far from clear how international coordination of bank resolutions would make much if any difference in the application of these rules. The core problem, which manifests itself in several ways, is that fairness cannot be achieved merely by means of either mandating enhanced coordination among authorities or even by delegating authority and control over the global wind-up or liquidation of a distressed or bankrupt financial institution to a single regulator or a single jurisdiction. This is because control over a bankrupt financial institution is meaningless without concomitant control over the *creditors* of such financial institutions.

### 1. Local Regulator's Creditor Control Problem

Control over the creditors is essential because the problem of unfairness arises when creditors prematurely grab portions of a bankrupt financial institution's assets. Local power that can claw these assets back into the bankrupt's estate, wherever that estate is being administered, inevitably is required in order to achieve the fair resolution of an insolvent financial institution.

Among the many obstacles to achieving local control over creditors of failed banks at an international level that have heretofore gone unrecognized are the following. First, generally speaking, clawing back the assets of an insolvent bank requires that some regulator make hard choices about which creditors of failed banks get to keep the assets that have been transferred to

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65. Equitable Subordination is the power to reclassify creditors' claims from high priority status to lower priority status in order to achieve an equitable result. See Legal Info. Inst., *Definition of Equitable Subordination*, CORNELL L. SCHOOL, [http://www.law.cornell.edu/wex/equitable\\_subordination](http://www.law.cornell.edu/wex/equitable_subordination).

66. The goal of rules against fraudulent conveyances is to prevent insolvent debtors from making transfers that "hinder, delay, or defraud their creditors." Douglas Baird & Thomas Jackson, *Fraudulent Conveyance Law and Its Proper Domain*, 38 VAND. L. REV. 829 (1985) (discussing the Statute of 13 Elizabeth).



them and which do not. Inevitably, these decisions require determinations of which creditors have acted in good faith, which creditors' contractual claims should be respected, and whether the applicable local norms of corporate behavior within corporations and among parents and subsidiaries have been respected. In other words, no failed financial institution can be resolved without picking and choosing among creditors.

Second, for reasons explained below, in virtually every case, the creditors from whom funds must be clawed back in order to effectuate a coordinated resolution of failed bank assets are actually sovereign governments or governmental institutions. It is implausible that sovereign nations will voluntarily relinquish their own sovereignty to the extent necessary to allow a foreign regulator access to assets they have obtained from failed banks through regulatory action.

Finally failed financial institutions that might be subject to international regulatory cooperation are organized into vast and complex corporate structures.<sup>67</sup> It is axiomatic that the failure of one juridical entity within a corporate group does not necessarily or automatically imply the failure of other entities within the group. Liquidations and reorganizations are done only to insolvent firms. Fairness can only be achieved in cross-border bankruptcy to the extent that payments among the solvent and insolvent companies within a financial conglomerate can be unwound.

## 2. The Problem of Picking and Choosing among Creditors

An international resolution process will also lead regulators to unfairly pick and choose among creditors. To understand the deep nature of this problem, it is necessary to understand the nature of the shadow banking system and to understand the problem of bank runs that still plagues the shadow banking system. Before the development of modern financial markets, depositors and creditors in bank runs withdrew their deposits or demanded payment of other extensions of credit to the financial institution. Bank runs over time have become electronic, as customers can move their money by tapping a few buttons on a keypad or touchscreen. Such fast electronic runs happen to various types of financial institutions that borrow and lend in the so-called shadow banking system.

The shadow banking system consists of the large, informal electronic markets in which various types of short-term financial credit not guaranteed by any government's deposit insurance scheme are traded. This sector of the financial markets is gigantic, and the financial participants generally are considered "too big to fail." As such, it appears that the giant financial institutions that participate in the shadow banking system have lower costs of

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67. See Table 1 *infra*.

funding because lenders are confident that the creditors of these institutions will be bailed out if the institutions themselves should fail. This unfairly penalizes smaller creditors who do not participate in the shadow banking system as well as smaller financial institutions that do not have access to the shadow banking system because they are not too big to fail.

Swap transactions, repurchase (repo) agreements, and sales of commercial paper dominate the shadow financing system. In a repurchase transaction, for example one firm sells securities to another along with a simultaneous promise to repurchase the securities from the buyer shortly thereafter, often the very next day. Repo transactions thus are in substance short-term loans for the seller of the securities, with the securities “sold” serving as collateral, and the loan repayment occurring when the seller of the securities repurchases them. Significantly, the repurchases of securities involved in repo transactions are made with, and depend upon, the seller-repurchaser being able to “roll-over” or immediately to effectuate a subsequent repo in order to obtain the funds required to repurchase the securities sold in the prior repo.

A run will occur in the shadow banking system anytime a seller of securities in the system is unable to roll over its outstanding repos or commercial paper issuances or swaps. Bankruptcy laws in the U.S. prevent these transactions from being unwound as a fraudulent conveyance,<sup>68</sup> for good reason. Unwinding these transactions would freeze capital markets and prevent financial institutions from obtaining the funding they need to operate. In general, securities transactions and transactions in the shadow banking system are protected from the trustee’s avoidance powers in bankruptcy in order to protect the financial markets from the disruption and possible collapse that would occur if securities transactions and settlement payments made in connection with securities transactions could be set aside and clawed back in bankruptcy.<sup>69</sup>

While the legal rules that protect such transactions are subject to abuse and manipulation by creditors and companies that disguise payments as “securities transactions” in order to avoid having such payments set aside, the fact remains that international agreements are not going to upset these rules

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68. See, e.g., 11 U.S.C. §§ 78, 101(53A), 109(d); 362, 741-753; 761-767; §§ 781-784; see also *In re Slatkin*, 525 F.3d 805 (9th Cir. 2008) (discussing exemption of margin and settlement payments from preference and certain fraudulent transfer powers normally applicable in bankruptcy); *In re Stewart Finance Co.*, 367 B.R. 909 (Bankr. M.D. Ga. 2007) (holding that the term “stockbroker” should be broadly construed—at least for Section 546(e) purposes—and finding the entity in question to be a “stockbroker”); *In re Nat’l Gas Distrib., LLC*, 369 B.R. 884 (Bankr. E.D.N.C. 2007) (evaluating whether a natural gas contract was a “swap agreement”); *Calyon N.Y. Branch v. Am. Home Mortgage Corp.*, 379 B.R. 503 (Bankr. D. Del. 2008); *Am. Home Mortgage Inv. Corp. v. Lehman Bros. Inc.*, No. 07-11047, 2008 WL 2156323 (Bankr. D. Del. May 23, 2008).

69. Official Comm. of Unsecured Creditors of Quebec World (USA) Inc. v. Am. United Life Insur. Co., 2013 WL 2460726 (2d Cir. 2013); *Enron Creditors Recovery Corp. v. Alfa (In re Enron Creditors Recovery Corp.)*, 651 F.3d 329, 334 (2d Cir. 2011).

because the stability of national and global financial markets depend on them, which is evidenced by the size of the shadow banking system.

The system has about \$15 trillion in assets, which makes it even larger than the traditional banking system.<sup>70</sup> When combined with similar problems that plague the derivatives markets, as one observer trenchantly has observed, “[i]t now seems that the 21st century will resemble the 19th and early 20th centuries, with periodic panics and runs on financial institutions, perhaps followed by deflationary collapses.”<sup>71</sup> In the Euro Zone, these problems have plagued banks and entire countries, like Greece and Portugal. The “country as bank” is a new and not entirely reassuring catch phrase, showing that the problem goes beyond the private sector.<sup>72</sup>

In sum, unwinding transactions in the modern banking system would not merely require surrendering regulatory turf over the insolvent financial institutions in a particular jurisdiction. It would also require local jurisdictions to surrender their authority over all of the creditors in a cooperating economy. And the problem does not end here. Government policy and practice appropriately connects bankruptcy rules and even exceptions to bankruptcy rules, and these rules and exceptions are critical to the very survival of domestic capital markets. It is highly unlikely that a sovereign such as the United States would agree to abdicate its authority to protect such transactions, even if such abdication is required to facilitate an international bank failure resolution scheme.

#### *B. Governments Have Their Own Interests at Stake in Controlling Bank Insolvencies*

Finally, for reasons explained below, in virtually every case, the creditors from whom funds must be clawed back in order to effectuate a coordinated resolution of failed bank assets are actually sovereign governments or governmental institutions. It is implausible that countries will permit a foreign regulator access to assets they have obtained from failed banks through regulatory action.

Governments do not want to relinquish power to foreign regulators because they have a strong interest in protecting whatever funds that local surviving financial institutions have managed to finagle from the coffers of insolvent institutions. This is because the primary concern of central banks during a financial crisis is that a “global imbalance” in capital flow will bring a

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70. Zoltan Pozsar, Tobias Adrian, Adam Ashcraft, & Hayley Boesky, *Shadow Banking*, Federal Reserve Bank of New York, Staff Report No. 458, July 2010, [http://www.ny.frb.org/research/staff\\_reports/sr458.pdf](http://www.ny.frb.org/research/staff_reports/sr458.pdf).

71. Tyler Cowen, *The Age of the Shadow Bank Run*, N.Y. TIMES, Mar. 24, 2012, <http://www.nytimes.com/2012/03/25/business/the-bank-run-updated.html>.

72. *Id.*

particular economy to its knees.<sup>73</sup> As we saw both in the Financial Crisis and in *BCCI*, global flows of capital strongly favor the United States and serve as a “stabilizing . . . source,” unlike in other countries where net outflows of capital create instability.<sup>74</sup> These global inflows of capital reduce the need for direct government support of financial institutions during crises. The implication here is that, at least for the United States, agreeing to cooperate in a global bankruptcy resolution process would expose the government’s balance sheet to significantly greater obligations in the form of bailout dollars than otherwise would be required. In other words, the likely costs to U.S. taxpayers of agreeing to cooperate in an international resolution of global financial could prove enormous.

*BCCI* provides a cogent example of the extent to which the government cooperation required to resolve the failure of a cross-border financial institution likely will be viewed more as capitulation than cooperation. Recall that the U.S. government imposed a fine of over \$200 million against *BCCI* and that it took those millions from *BCCI* before allowing the funds to be added to the *BCCI*’s global bankruptcy estate. It seems implausible that the United States, or any other sovereign, would permit another government to determine when it could collect a fine for alleged financial peccadillos that occurred within its borders.

The ring-fencing utilized both in *BCCI* and Lehman is a strong indication that the United States is not interested in cooperating. It also indicates at least one way in which the United States is the beneficiary of the status quo, ad hoc, country-by-country resolution process. As Table 2 shows, a small number of countries, led by the United States, and including the United Kingdom and Japan, dominate the world market in stock exchange transactions, and this dominance is growing. The United States also dominates foreign exchange trading, since the dollar remains the primary reserve currency. As a result, at least one leg of most foreign exchange transactions occurs in the United States.

As the travails of the IBJ in the *BCCI* insolvency illustrates, when settlements occur in the United States the opportunity to benefit U.S. creditors at the expense of non-U.S. creditors emerges, particularly when international coordination exists. After all, the New York Fed was only able to freeze payouts by *BCCI* counter-parties because of international cooperation, for it was informed of *BCCI*’s insolvency by regulators in other jurisdictions. This information alerted the authorities to the fact that they could benefit U.S. interests by allowing the banks that were settling *BCCI*’s foreign exchange trades to receive funds from non-U.S. debtors of *BCCI*, but forbidding these banks to transmit funds due to non-U.S. creditors of *BCCI*. In other words, in one of the most important international financial institution insolvencies in

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73. Ricardo J. Caballero, *The “Other” Imbalance and the Financial Crisis* (Nat’l Bureau of Econ. Research, Working Paper No. 15636, 2010), <http://www.nber.org/papers/w15636>.

74. *Id.* at 2.

history, international cooperation enabled the U.S. authorities to effectuate a palpably unfair distribution of the failed institution's assets.

A further obstacle to international cooperation is caused by the explicit and implicit guarantees that the United States and other governments provide to creditors of systemically important financial institutions. Both the Federal Reserve and the European Central Bank responded to the Financial Crisis by making medium-term loans of large sums of money to local banks at very low rates of interest. These governments, of course, have begun to request that these loans be repaid. They are unlikely to accede to any agreement that affects their ability to be repaid for such loans.

*C. The Organization of International Financial Institutions as an Obstacle to International Resolutions*

Moreover, it is tautologically true that the failed financial institutions that might be subject to international regulatory cooperation are organized into vast and complex corporate structures. The problem is that the failure of one or more juridical entities within a corporate group does not necessarily or automatically imply the failure of other entities within the group. Solvent organizations within a global financial conglomerate are not liquidated or reorganized when one or more companies with whom such solvent organizations share a common owner fail. Unless the international community agreed to disregard the corporate forms of affiliates (such as subsidiaries and parent companies) of insolvent financial institutions, then the assets of solvent subsidiaries and parents of failed financial institutions cannot be liquidated or transferred to satisfy creditors' claims in a cross-border insolvency proceeding, regardless of the level of cooperation on the part of the governments in which such affiliates are located.

**III. A Feasible Alternative Approach to Both Ring-Fencing and Total Consolidation**

As noted above,<sup>75</sup> where ring-fencing is allowed, branches and, as in *BCCI*, other affiliates such as agencies and subsidiaries of foreign banks, will be treated as separate legal entities and will be wound-up as such. Interestingly, then, the very existence of ring-fencing provides strong evidence that banking regulators are not indifferent about which particular bank creditors are favored in an insolvency. This, in turn, indicates that the FDIC, the agency that by law serves as receiver in every failed bank, has preferences about which creditors should, at the margin, be paid over others.<sup>76</sup> An obvious example is insured

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75. See Campbell, *supra* note 17.

76. The FDIC serves as receiver for all failed national banks and national thrift institutions. 12 U.S.C. § 1821(c)(2)(A)(ii) (2012). See also CARNELL, MACEY & MILLER, *supra* note 18, at 492.

depositors, as distinct from uninsured depositors. The FDIC, in its capacity as insurer, prefers that assets be used to pay insured depositors, who tend to be local, to uninsured depositors, who are more likely to be foreign creditors of a failed global financial institution.-

The practice of ring fencing is generally criticized and viewed an example of poor global citizenship. Moreover, ring fencing is inconsistent with best practices in international law. Specifically, Article 13(1) of the United Nations Commission on International Trade Law (“UNCITRAL”)<sup>77</sup> prohibits ring-fencing, stipulating that: “foreign creditors have the same rights regarding the opening of, and participation in, a proceeding under [identify laws of the enacting State relating to insolvency] as creditors in this State.”

As developed in Part I of this Article, it is hardly surprising that, while the United States has adopted certain sections of this Model Law, it has not adopted Article 13. And the United States is unlikely to change its position, at least as long as domestic law continues to reflect the preferences of U.S. regulators and the creditors. The ability and willingness of the United States to act aggressively to freeze the assets and to ignore the off-shore liabilities of insolvent cross-border financial institutions suggests that the ring-fence approach strongly favors U.S. interests. As such, it is plausible that the homage paid by U.S. politicians and regulators to the virtues of international regulatory cooperation may be mere lip-service.<sup>78</sup>

#### *A. Obstacles to Ring-Fencing*

While this Article focuses on the public-choice rationales for the United States’ stolid embrace of ring-fencing, I fully recognize that there are also obstacles to ring-fencing., such as the complexity of cross-border financial institutions, the lack of honest or competent regulators in certain foreign nation-states that might attempt to assert jurisdiction over a particular failed institution, and substantive difference among the insolvency laws of different states. While these problems are formidable, they all are surmountable, as evidenced by the ability of multiple jurisdictions to harmonize their capital rules, notwithstanding the fact that these same obstacles also existed there.

For example, if foreign regulators are corrupt or biased in favor of certain creditors on the basis of inappropriate criteria such as kinship or cronyism, then regulators in other jurisdictions would be justified in taking the position that

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77. UNCITRAL is a subsidiary body of the United Nations General Assembly. It prepares legislative texts for use by States in modernizing commercial law.

78. See, e.g., Barack Obama, *Promoting International Regulatory Cooperation*, Jan. 5, 2012 Executive Order 13609, <http://www.whitehouse.gov/the-press-office/2012/05/01/executive-order-promoting-international-regulatory-cooperation>; Kathleen Casey, Commissioner, U.S. Sec. & Exchange Comm., *The Role of International Regulatory Cooperation and Coordination in Promoting Efficient Capital Markets*, Address at the before Instituto Bruno Leoni (June 12, 2010) (transcript available at <http://www.sec.gov/news/speech/2010/spch061210klc.htm>).

repatriating the assets of a failed financial institution would result in such assets being pilfered or squandered.

While foreign corruption or bias might lead to concerns on the part of U.S. regulators about cooperating in a global bankruptcy by repatriating a failed bank's assets to a foreign jurisdiction, regulators in other jurisdictions would be justified in having concerns about the costs and inefficiencies in the U.S. system, where legal fees and jurisdictional competition among judges for large cases leads to waste, and even, as at least one scholar has argued, corruption.<sup>79</sup> In the United States it "often takes years to resolve individual cases. As a result of such delays, much of the operating value of businesses can be destroyed."<sup>80</sup> Such delays are attributable to the fact that the bankers and lawyers, whose financial analyses, motions practice, deposition scheduling, and other tactics can influence significantly the speed of a bankruptcy proceeding, have private incentives to keep the bankruptcy proceedings going until the debtor's assets are fully depleted and these professionals no longer can be paid.

Interestingly, however, in the United States, unlike in other countries, bank insolvencies are generally not administered in bankruptcy courts or other judicial forums.<sup>81</sup> Rather, the Federal Deposit Insurance Corporation (FDIC) serves simultaneously as both the receiver and the primary creditor of failed institutions. As such, the egregious inefficiencies that characterize the bankruptcy process in general likely do not characterize the resolution process for failed banks. Interestingly, in the wake of the Financial Crisis, the creditors of important non-bank financial institutions such as hedge funds, private equity firms, insurance companies and investment banks were exempted from the bloated bankruptcy process that non-financial firms and smaller financial firms endured.<sup>82</sup>

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79. See LYNN M. LOPUCKI, *COURTING FAILURE: HOW COMPETITION FOR BIG CASES IS CORRUPTING THE BANKRUPTCY COURTS* (2006).

80. Michael C. Jensen, *Corporate Control and the Politics of Finance*, 4 J. OF APPLIED CORP. FIN. 13, 29 (1991); see also Lynn M. LoPucki & Joseph W. Doherty, *The Determinants of Professional Fees in Large Bankruptcy Organization Cases*, 1 J. OF EMPIRICAL LEGAL STUD. 111 (2004); Lynn M. LoPucki & Sarah D. Kalin, *The Failure of Public Company Bankruptcies in Delaware and New York: Empirical Evidence of a 'Race to the Bottom*, 54 VAND. L. REV. 231 (2001).

81. In the United States, Congress has conferred to the Federal Deposit Insurance Company (FDIC) "virtually complete responsibility for resolving failed federally insured depository institutions" and Congress also has entrusted the FDIC with "expansive powers to ensure the efficiency of the process. In exercising this significant authority, the FDIC is required by statute to maximize the return on the assets of the failed bank or thrift and to minimize any loss to the insurance funds." RESOLUTIONS HANDBOOK, FED. DEPOSIT INS. CORP. 70 (2003), <http://www.fdic.gov/bank/historical/reshandbook/ch7recvr.pdf>.

82. Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act provides the FDIC with the "exclusive authority" to resolve "covered financial institutions," in a manner that is "substantially similar to the FDIC's resolution process for depository institutions." [Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010), 12 U.S.C. §§ 5381(a)(8), 5383(b) (2012)]. A covered financial institution is by defined by Dodd-Frank as any non-bank financial institutions whose failure and resolution under bankruptcy would pose systemic risk. *Id.* at § 5383(b). Thus, under the FDIC Act and Title II of Dodd-Frank, both federally insured depository

The fact that it is highly unlikely that the goal of achieving a plenary global regulatory structure for resolving failed banks will be achieved in the foreseeable future does not mean that progress cannot be made on a smaller scale. In fact, the potential problems of corruption, cronyism and inefficiency identified here (in addition to the fairness concerns I raised earlier) indicate that a plenary global regulatory structure may not even be desirable, notwithstanding the near-universal rhetoric in favor of it.

### *B. The Most Deserving Creditor Proposal*

What I propose focuses on classes of creditors of failed financial institutions rather than on geography. My approach builds on the simple premise that some creditors, regardless of where they are located, deserve our sympathy more than others. Small retail depositors are particularly sympathetic creditors. I surmise that there would be broad support for a policy proposal that gave priority access to the claims of small, uninsured individual retail creditors, regardless of where those assets happen to be located.

Reverting yet again to the BCCI insolvency, the “underprivileged creditor” approach suggested here might have had more chance of success in repatriating BCCI assets located in the United States to the global insolvency proceeding than vague appeals to the virtues of international cooperation and. On the one hand, it is plausible that BCCI might have deserved to be fined by the U.S. government for filing false statements with U.S. regulators. On the other hand, it is not plausible that the U.S. government deserved the \$250 million it received in the insolvency more than the struggling East Indian and Pakistani shopkeepers who lost their lives’ savings when BCCI was declared insolvent.

The approach advocated in this Article would not require the United States or any other country to abandon a ring-fence approach in resolving an insolvent financial institution. Rather, I envision each of the various jurisdictions involved in resolving a failed bank agreeing to make good faith sacrifices in order to generate fairer, more equitable outcomes in the cross-border failure resolution process. Specifically, my approach would allow any jurisdiction involved in the resolution process for a failed global financial institution to identify any “particularly deserving creditors” in their jurisdictions to the regulators in the other jurisdictions involved in the resolution process. While it would be highly desirable to reach an international accord that defines *ex ante* what a “particularly deserving creditor” is, such an accord is not a necessary precondition to the implementation of my proposal. Rather, the approach that I envision would empower the receiver appointed to marshal and distribute the assets of a failed financial institution in a particular

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institutions and non-bank financial institutions whose failure and resolution under bankruptcy would pose systemic risk must be resolved and administered by the FDIC rather than the courts. *Id.*



jurisdiction to also file a claim in any parallel, ring-fenced bankruptcy proceeding in another jurisdiction for extraordinary relief. The claim would allow individual jurisdictions to determine for themselves what classes of creditors should be designated as “particularly deserving”

I fully recognize that the term “particularly deserving creditor” may be so nebulous such that its definition and scope could be easily debated. Defining the term likely would be the subject of intense controversy among the nation-states involved in international insolvencies. It is for this reason that the solution I propose is based on an incremental, common law approach. The approach does not require countries to sacrifice sovereignty over either banks or creditors.

Rather, than appealing to the better natures of the decision-makers involved in the restructurings of collapsed financial firms, my approach relies exclusively on the “court of public opinion” as its enforcement mechanism. The realist paradigm embraced in this Article, assumes that nation-states and their leaders are motivated by self-interest. But bureaucrats’ and politicians’ self-interest is affected in important ways by public opinion. It is in the self-interest of bureaucrats and politicians to be perceived as “doing the right thing” and as not caving into powerful special interest groups. In other words, rationally self-interested political actors will care about public opinion, not always, but at least sometimes. On the one hand, there is no question that policy choices frequently are so abstract, obscure or technologically complex that public opinion matters little, if at all. But sometimes a particular policy issue will crystallize in the public’s imagination because it is both salient and comprehensible. When this happens, public opinion becomes a key cause of social policy generosity.<sup>83</sup> As noted above, this is not because policy-makers are altruistic; it is because they are self-interested. Particularly relevant to this analysis is the fact that public opinion has acted as a brake on policy makers’ inclination to push for social policy retrenchment.<sup>84</sup> This is not because policymakers are anything other than self-interested. It is because they are self-interested. Their self-interest, however, sometimes motivates them to be altruistic, such as when they believe that appearing altruistic is the preferred political survival strategy. Here my point is that by reframing the issue into one of elemental fairness rather than one of national interest, it might be possible to change the incentives facing policy makers such that they determine that ring-fencing no longer becomes the political-support maximizing strategy.

Policy attitudes are open to different perceptions of reality.<sup>85</sup> This hypothesis is consistent with studies showing that concrete policy attitudes are

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83. CLEM BROOKS & JEFF MANZA, WHY WELFARE STATES PERSIST: THE IMPORTANCE OF PUBLIC OPINION IN DEMOCRACIES 7-11 (2007); Clem Brooks & Jeff Manza, *Social Policy Responsiveness in Developed Democracies*, 71 AM. SOC. REV. 474 (2006).

84. *Id.*

85. Christian Larsen, *The Institutional Logic of Welfare Attitudes: How Welfare Regimes Influence Public Support*, 41 COMP. POL. STUD. 145-148 (2007).

highly dependent on the framing of political issues.<sup>86</sup> By framing the issue on the basis of which individual creditors or classes of creditors are most deserving, rather than on the basis of which nation-state should give the authority over the various creditors' claims on the assets of a failed financial institution, policy attitudes are more likely to be shaped in a way that is sympathetic to outcomes that are broadly viewed as more equitable.

Significantly, in Coughlin's seminal cross-national study of deservingness, the ranking of deserving groups was consistent in every country analyzed. Specifically, the public favored the elderly above all other groups, followed by the sick and disabled, need families with children and the unemployed.<sup>87</sup> More generally, groups most likely to be designated as particularly deserving creditors in the court of public opinion will be those who can demonstrate that their problems are beyond their immediate control.<sup>88</sup> One academic, Christain Larsen, presents the following hierarchy of deservingness:

(a) Control - those who lack control of their situation, with the lower the degree of control the higher the degree of deservingness;

(b) Need – those with the greatest need will be considered most deserving;

(c) Identity – The more that citizens are able to identify and feels a sense of group belonging with a group, the more deserving such citizens will consider that group to be;

(d) A grateful attitude—the more grateful, and, apparently, the more docile and compliant a group appears to be, the more deserving it will appear;

(e) A proclivity for reciprocity – the greater the past or expected future payback, the more deserving a group will appear.<sup>89</sup>

Analysis of these factors in the context of the BCCI insolvency provides grounds for cautious optimism.<sup>90</sup> An estimated 1.3 million depositors around

86. *Id*; see also O. Kangas, *Self-Interest and the Common Good: The Impact of Norms, Selfishness and Context in Social Policy Opinions*, 26 J. SOC. ECON. 475, 475 (1997); W.A. Gamson and A. Modigliani, *The Changing Culture of Affirmative Action*, in 3 RESEARCH IN POLITICAL SOCIOLOGY 137-138 (Richard G. Braungart ed., 1987).

87. RICHARD COUGHLIN, *IDEOLOGY, PUBLIC OPINION AND WELFARE POLICY* (1980); see also W. Arts & W. Van Oorschot, *The Social Capital of European Welfare States: The Crowding Out Hypothesis Revisited*, 15 J. EUR. SOC. POL'Y 5, 5-26 (2005).

88. Jeffrey A. Will, *The Dimensions of Poverty: Public Perceptions of the Deserving Poor*, 22 SOC. SCI. RES. 312, 329 (1993); see also Bernard Weiner, Danny Osborne, & Udo Rudolph, *An Attributional Analysis of Reactions to Poverty: The Political Ideology of the Giver and the Perceived Morality of the Receiver*, 15 PERSONALITY AND SOC. PSYCHOL. REV. 199, 199 (2011).

89. Larsen, *supra* note 87, at 149; W. Van Oorschot, *Who Should Get What, and Why? On Deservingness Criteria and the Conditionality of Solidarity Among the Public*, 28 POL'Y & POL. 33, 34-37 (2000).

90. The same cannot be said for the Lehman bankruptcy, unfortunately. It appears that "the most aggrieved" of Lehman's trading partners was Bank of America, who was owed a reported \$500 million, which it posted as collateral to support derivative transactions between itself and the respective Lehman entities. Other major creditors were major hedge funds, hardly the sort of claimants likely to evoke widespread public sympathy. Matthew Goldstein, *Lehman Brothers Bankruptcy Gets Ugly*, BLOOMBERG BUSINESSWEEK, Oct. 2, 2008, [http://www.businessweek.com/investing/insights/blog/archives/2008/10/lehman\\_bankrupt.html](http://www.businessweek.com/investing/insights/blog/archives/2008/10/lehman_bankrupt.html).

the world stood to lose their savings when BCCI, which had seventy branches around the world, collapsed.<sup>91</sup> Many depositors who were ultimately not compensated, or compensated after years of distress, have both less control and more need than creditors who received more value for their claims. This is because some depositors, such as insiders, are better at monitoring the solvency of a bank than other depositors. These depositors may also negotiate to obtain compensation for greater levels of perceived risk, and can access a wide range of banks as potential sources in which to allocate their cash. Less sophisticated depositors—the losers in *BCCI* and *Lehman*—cannot monitor or access funds on a nationwide or worldwide basis. It is more likely that such depositors will be deemed to lack control when a bank collapses and these depositors are too slow to try to grab them. To most populations, these creditors will likely be considered deserving for lack of control and depth in need to the extent that such depositors have small claims and that such claims constitute a large percentage of their overall assets.

The third factor, identity, is more ambiguous. The largest identifiable group that may have qualified as deserving creditors under this criterion were the owners and employees of small Asian businesses, each of whom lost thousands of pounds when BCCI closed down.<sup>92</sup> Small Pakistani businesses and their employees and owners were among the most numerous of BCCI's U.K. depositors. This stands to reason because *BCCI* was founded by a Pakistani entrepreneur and became what has been described as: the bank of choice for members of the Asian community, who were outsiders, often shunned by traditional British banks. But at B.C.C.I. they found a welcome, people who looked like they did, spoke their language and understood their problems. To walk into a B.C.C.I. branch was to enter a comfortable world of shared cultural assumptions and business norms.<sup>93</sup>

While the Asian population in the United States has been growing, by 2000 only 4.21% of the U.S. population was Asian, and of this group only .06% was Pakistani, and 0.58% was Asian-Indian.<sup>94</sup> If the lack of a sense of familiarity with a given group causes citizens to feel that members of said group are less deserving, then this group of most deserving creditors (under the control and need criteria) might have less success under the identity criterion.

Some support for this perspective emerges from the history of the BCCI resolution. For example, the Sultan Waboos of Oman ordered a royal grant of

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91. *Ruler to Fully Compensate BCCI Depositors in Oman*, ASSOCIATED PRESS NEWS ARCHIVE (Feb. 16, 1992), <http://www.apnewsarchive.com/1992/Ruler-To-Fully-Compensate-BCCI-Depositors-In-Oman/id-40b6e1d2b639220b20f2b02416932bc1>.

92. *Britain's Biggest Banking Scandal*, BBC NEWS (Jan. 13, 2004), <http://news.bbc.co.uk/2/hi/business/3383461.stm>.

93. STEVE LOHR, *The Bitter Victims of B.C.C.I.'s Fall*, N.Y. TIMES, Aug. 29, 1991, <http://www.nytimes.com/1991/08/29/business/the-bitter-victims-of-bcci-s-fall.html>.

94. TERRANCE REEVES & CLAUDETTE BENNETT, CENSUS 2000 SPECIAL REPORTS, *We the People: Asians in the United States*, at 1, (Dec. 2004), <http://www.census.gov/prod/2004pubs/censr-17.pdf>

several millions rials<sup>95</sup> to compensate the roughly 7,000 Omani investors.<sup>96</sup> In doing this, Oman enabled all of the Omani depositors in BCCI to receive 100 percent repayment of their depositors, rather than the “20 or 30 percent received by depositors in some other countries.”<sup>97</sup>

On the other hand, countries in general, and the U.S. in particular are becoming more diverse. As such, people’s exposure to other religious, cultural, and ethnic groups is increasing, and is likely to bring with it greater identification and empathy. This, of course provides a basis for optimism, albeit guarded optimism, that the framework offered here today may have generated positive results for the poor, unsophisticated creditors of BCCI abroad.

The penultimate criterion, grateful attitude, appears indeterminate. It is not clear how a group would express their gratitude for being compensated by another company in an international bank failure.

The final criterion, a proclivity for reciprocity, does not auger in favor of the likelihood that poor, financially unsophisticated depositors will be embraced as particularly deserving. Economically poor creditors are unlikely to repay their benefactors. However, it also is clear that social welfare benefits would rarely be extended to anybody if the ability to reciprocate were a prerequisite. Because degree of need is one of the main criteria, it stands to reason that those who are most deserving under the need criterion will be the ones least likely to be in a position to reciprocate.

Thus, using *BCCI* as a natural experiment in the application of the approach advocated here, there is strong evidence that appeals made on behalf of deserving creditors could be successful. This argument becomes stronger in light of the fact that, unlike most appeals for social welfare wealth transfers, the money to fund the transfers under my approach would not come out of taxpayers’ pockets. Rather the source of the funds would be the assets of the failed institution wherever such assets can be found. The cost of these transfers would not be born directly by the government or the taxpayers, but other, more sophisticated creditors of the failed institutions who would receive lower distributions.

### *C. Counter-Arguments and Moral Hazard*

I will now address four possible arguments against my proposal. Though I do not claim that this represents an exhaustive list of all critics’ possible objections, I believe the three criticisms rebutted here are the most probable.

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95. At the time \$1 rial equaled approximately \$2.60. See *Ruler to Fully Compensate BCCI Depositors in Oman*, *supra* note 93.

96. *Id.*

97. *Id.*

## 1. Lack of Precedent

One objection to this proposal is that under existing U.S. bankruptcy law, there is no formal designation or specific legal status accorded to “particularly deserving creditors.” Instead, creditors are supposed to receive in a liquidation or reorganization of a bankrupt firm precisely what they are entitled to receive under state law and contract. Secured creditors, for example, have priority status over unsecured creditors, notwithstanding the fact that secured creditors often are sophisticated, deep-pocketed lenders. As such, one might argue that it is inconsistent to provide protection to “particularly deserving creditors” in international insolvencies but not to provide such protection in domestic insolvencies.

The flaw with this objection is that while creditors in the United States are not generally protected because they are “particularly deserving,” there remain, in part for other reasons, special protections under U.S. law for such creditors. For example, up to \$250,000 of the claims of creditors of failed U.S. banks whose status as creditors derives from the fact that they are *depositors* in such banks, are protected by the Federal Deposit Insurance Company Act.<sup>98</sup> The non-bank institutions that are subject to resolution by the FDIC are too-big-to-fail, and even the most undeserving creditors of those financial institutions generally receive payment of the debts they are owed (though the shareholders typically are not similarly protected).<sup>99</sup> One way of implementing the “particularly deserving creditors” proposal advanced here would be for the United States to accord priority status to *all* uninsured creditors (such as the depositors in BCCI) of failed cross-border financial institutions whose claims are less than \$250,000. Assets would be reallocated to the jurisdiction with such relatively small claim creditors on a priority basis.

## 2. Windfall for Governments?

Further, with respect to my proposal, I do not endorse extending priority status to creditors of failed banks whose claims may be satisfied by a deposit insurance regime or any sort of bailout by a given jurisdiction. Government rescues and insurance schemes put the government in the shoes of the creditors who are insured or bailed out, making them the real parties-in-interest in such

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98. The Federal Deposit Insurance Corporation (FDIC) provides deposit insurance guaranteeing the safety of a depositor's accounts in member banks up to \$250,000 for each deposit ownership category in each insured bank. As of September 30, 2012, the FDIC insured deposits at 7,181 institutions. Fed. Deposit Ins. Co., *Statistics at a Glance*, <http://www.fdic.gov/bank/statistical/stats/2012mar/fdic.html> (last visited Sept. 14, 2013).

99. The concept of “too big to fail” implies, among other things, that creditors of large financial institutions “are protected by an implicit government guarantee against failure,” which means that insolvent institutions that are too big to fail will be resolved in such a way that, like Bear Stearns and others, the claimants on the liability side of their balance sheets will receive payment on the debts they are owed.

cases and not their depositors. Governments, unlike depositors, are not “particularly deserving creditors,” because they display none of the characteristics of lack of control, need, identity, grateful attitude or proclivity for reciprocity that justifies designation as a particularly deserving creditor. Moreover, government-to-government assistance, including assistance to governments paying the claims of depositors of failed banks, is not an appropriate use of funds in bank insolvency proceeding. Rather, such government-to-government payments are instruments and expressions of foreign policy and are properly left in the purview of the diplomatic corps.

### 3. The Problem of Moral Hazard

A third potential concern with my approach is moral hazard. Banking regulators could, conceivably, allow domestic banks to take greater risks than they would do otherwise, to the extent that the regulators foresaw that some portion of potential losses generated by such excessively risky activities might be shouldered by more responsible jurisdictions who might succumb to appeals by the creditors of failed banks chartered in less responsible jurisdictions. Similarly, one might even imagine that bank regulators would reduce deposit insurance protection available to depositors to the extent that they believed that help from abroad might be available to satisfy some or all of the claims of uninsured depositors.

These concerns are remote for three reasons. First, the prospect of being designated a particularly deserving creditor is remote. Second, even if a particular creditor or class of creditors received such a designation, it is highly unlikely that a foreign government or consortium of foreign governments would have the financial wherewithal or the political will to repay such creditors the principal and interest owed to them in full. Third, because payments under the framework I am proposing are voluntary, and result from appeals to political motivations of the regulators in wealthier jurisdictions, regulators faced with appeals from receivers and regulators in cross-border insolvency proceedings could and should take into account the role of the local regulators and the local regulatory regime as causal factors in the crisis. Similarly, I would not accord priority status to the creditors of government-owned depository institutions such as those that dominate the financial landscape in China.

### 4. The Scope of the Proposal

Finally, I recognize that these limitations on my proposal make the proposal subject to the criticism that it is so narrow that it is unlikely ever to be applied. There are two responses to this. First, the failures of BCCI and Lehman provide real-world examples of situations in which my “particularly deserving creditor” approach would be applied. As noted above, the BCCI

creditors who were unpaid were recent immigrants to the U.K., many of these people were in economically marginal if not struggling conditions. In *Lehman*, the inequity of favoring the U.S. creditors was not as obvious, but there is certainly no basis for the notion that the U.S. creditors were more deserving than their European counterparts. And treating similarly situated creditors differently simply on the grounds that they are situated in a more powerful jurisdiction is not fair.

Second, the fact that my proposal would rarely be applied is not really a criticism of my proposal. If it turns out that there really are few if any cross-border bankruptcies in which “particularly deserving creditors” exist, then it must be the case that there is just not much need in eliminating the ring-fence approach to international insolvency.

#### IV. Conclusion

This Article explains why ring-fencing has not been completely replaced by a coordinated international response. I have argued that an international approach would be contrary to the United States’ interests because it would reduce the power of U.S. regulators and disadvantage U.S. creditors.

The mere fact that the United States and U.S. creditors generally benefit from the ring-fencing approach does not necessarily mean that this approach is undesirable normatively. In fact, the opposite may be true. Regulators may move even more slowly under a consolidated approach to international insolvency, as they will no longer face any pressure to close firms quickly to avoid having assets transferred to other jurisdictions. In short, consolidating the resolution process for failed financial institutions, in my view, will not necessarily deter the “race for assets” among creditors that would otherwise occur under the piecemeal collection rules of local jurisdictions, and it likely will make such a race even worse. Moreover, a centralized failure resolution process effectuated through cross-border agreements among bank regulators will not deter individual creditors from racing to grab assets ahead of a possible problem in a bank.

The spectacular inequity of *BCCI* and *Lehman* provides a useful indication of who the losers and winners in international, multiple-jurisdiction bank failures are likely to be. U.S. creditors, particularly the U.S. government, boot-strapped itself into creditor status by imposing a massive fine on BCCI before repatriating the bank’s assets to the global insolvency proceeding—a proceeding that the U.S. had opportunistically exempted itself from.

Put another way, the phenomenon of Herstatt risk is not limited to the risk that a bank or other global financial institution will fail before completing both legs of a foreign exchange or other cross-border transaction. Rather, Herstatt risk also includes the risk that when such a financial institution fails, regulators will either refuse to repatriate assets to a global, coordinated bankruptcy proceeding or respond to the financial institution’s failure by declining to

permit the payment of the second leg of an uncompleted trade to increase the assets in that jurisdiction for payouts to domestic creditors.

Finally, in this Article I suggest that a more promising strategy of achieving a greater degree of coordination among regulators when global financial institutions fail would be to frame the debate in terms of favoring the particularly deserving uninsured small creditors of such an institution. The interests and characteristics of this group, albeit inchoate, will be both more salient and more compelling than vague appeals to international comity and cooperation.



TABLES

| Table 1. Organizational Structure of 16 Large Complex Financial Institutions |           |           |                       |                 |               |             |                    |           |
|--|-----------|-----------|-----------------------|-----------------|---------------|-------------|--------------------|-----------|
| Financial Institution Name   | NUMBER OF |           |                       |                 |               |             | % of Foreign Subs: | Countries |
|  | Bank Subs | Ins. Subs | Mutual Funds and SPVs | Other Fin. Subs | Non-Fin. Subs | Total Subs: |                    |           |
| Citigroup  | 101       | 35        | 706                   | 584             | 1,009         | 2,435       | 50%                | 84        |
| Deutsche Bank AG   | 54        | 9         | 458                   | 526             | 907           | 1,954       | 77%                | 56        |
| Bank of America  | 32        | 24        | 396                   | 282             | 673           | 1,407       | 28%                | 29        |
| HSBC   | 85        | 37        | 246                   | 381             |               | 1,234       | 61%                | 47        |
| BNP Paribas  | 88        | 74        | 102                   | 433             |               | 1,170       | 61%                | 58        |
| RBS  | 31        | 29        | 168                   | 450             | 483           | 1,161       | 11%                | 16        |
| Morgan Stanley   | 19        | 22        | 225                   | 170             | 616           | 1,052       | 47%                | 46        |
| BarclaysPlc  | 49        | 21        | 309                   | 239             | 385           | 1,003       | 43%                | 73        |
| Societe Generale   | 81        | 13        | 93                    | 270             | 387           | 844         | 56%                | 60        |
| JPMorgan Chase.  | 38        | 17        | 229                   | 145             | 375           | 804         | 51%                | 36        |
| ABN AMRO   | 50        | 7         | 129                   | 204             | 280           | 670         | 63%                | 43        |
| USBAG  | 29        | 2         | 121                   | 66              | 199           | 417         | 96%                | 41        |
| Goldman Sachs  | 7         | 4         | 48                    | 151             | 161           | 371         | 51%                | 21        |
| Credit Suisse  | 31        | 4         | 91                    | 63              | 101           | 290         | 93%                | 31        |
| Merrill Lynch  | 16        | 9         | 85                    | 89              | 68            | 267         | 64%                | 25        |
| Average  | 47        | 20        | 227                   | 270             | 440           | 1005        | 57%                | 44        |
| Max  | 101       | 74        | 706                   | 584             | 1009          | 2435        | 96%                | 84        |
| Min  | 7         | 2         | 48                    | 63              | 68            | 267         | 11%                | 16        |
| Lehman Brothers  | 9         | 3         | 84                    | 210             | 127           | 433         | 45%                | 20        |

Table 2: Global Time Zones

| New York      | London +5 hours | Frankfurt +6 hours | Tokyo +13 hours  | Hong Kong +13 hours)   |
|---------------|-----------------|--------------------|------------------|------------------------|
| 9:30 to 16:00 | 08:00-16:30     | 09:00 -17:30       | 09:00 to 15:00   | 09:15 to 16:00 - lunch |
|               | (2.0 h overlap) | (2.0 h overlap)    | (zero h overlap) | (zero h overlap)       |
| 24:00         | 05:00           | 06:00              | 13:00            | 13:00                  |
| 01:00         | 06:00           | 07:00              | 14:00            | 14:00                  |
| 02:00         | 07:00           | 08:00              | 15:00            | 15:00                  |
| 03:00         | 08:00           | 09:00              | 16:00            | 16:00                  |
| 04:00         | 09:00           | 10:00              | 17:00            | 17:00                  |
| 05:00         | 10:00           | 11:00              | 18:00            | 18:00                  |
| 06:00         | 11:00           | 12:00              | 19:00            | 19:00                  |
| 07:00         | 12:00           | 13:00              | 20:00            | 20:00                  |
| 08:00         | 13:00           | 14:00              | 21:00            | 21:00                  |
| 09:00         | 14:00           | 15:00              | 22:00            | 22:00                  |
| 09:30         | 15:00           | 15:30              | 22:30            | 22:30                  |
| 10:00         | 15:30           | 16:00              | 23:00            | 23:00                  |
| 11:00         | 16:00           | 17:00              | 24:00            | 24:00                  |
| 11:30         | 16:30           | 17:30              | 24:30            | 24:30                  |
| 12:00         | 17:00           | 18:00              | 01:00 (next day) | 01:00 (next day)       |
| 13:00         | 18:00           | 19:00              | 02:00            | 02:00                  |
| 14:00         | 19:00           | 20:00              | 03:00            | 03:00                  |
| 15:00         | 20:00           | 21:00              | 04:00            | 04:00                  |
| 16:00         | 21:00           | 22:00              | 05:00            | 05:00                  |
| 17:00         | 22:00           | 23:00              | 06:00            | 06:00                  |
| 18:00         | 23:00           | 24:00              | 07:00            | 07:00                  |
| 19:00         | 24:00           | 01:00              | 08:00            | 08:00                  |
| 20:00         | 01:00           | 02:00              | 09:00            | 09:00                  |
| 20:15         | 01:15           | 02:15              | 09:15            | 09:15                  |
| 21:00         | 02:00           | 03:00              | 10:00            | 10:00                  |
| 22:00         | 03:00           | 04:00              | 11:00            | 11:00                  |
| 23:00         | 04:00           | 05:00              | 12:00 (next day) | 12:00 (next day)       |

On the Enduring Attraction of the Ring-Fence Approach

Table 3:

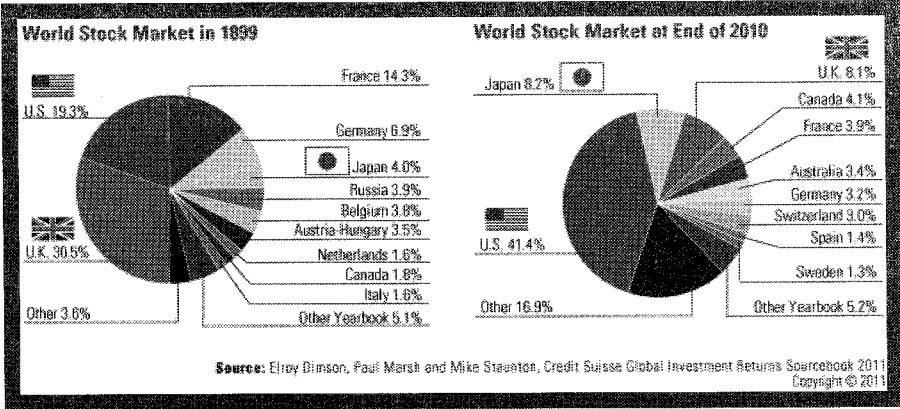


Table 4

Legislation based on the UNCITRAL Model Law on Cross-Border Insolvency has been adopted in: the following countries:

| State  | Year of Adoption |
|--|------------------|
| Australia  | 2008             |
| Canada   | 2005             |
| Colombia   | 2006             |
| Eritrea  | 1998             |
| Greece   | 2010             |
| Japan  | 2000             |
| Mauritius  | 2009             |
| Mexico   | 2000             |
| Montenegro   | 2002             |
| New Zealand  | 2006             |
| Poland   | 2003             |
| Republic of Korea                                    | 2006             |
| Romania  | 2002             |
| Serbia   | 2004             |
| Slovenia   | 2007             |
| South Africa   | 2000             |
| Uganda   | 2011             |
| United Kingdom of Great Britain and Northern Ireland |                  |
| British Virgin Islands                               | 2003             |
| Great Britain  | 2006             |
| United States of America                             | 2005             |

Source: UNCITRAL, UNCITRAL Model Law on Cross-Border Insolvency (1997) [http://www.uncitral.org/uncitral/en/uncitral\\_texts/insolvency/1997Model.html](http://www.uncitral.org/uncitral/en/uncitral_texts/insolvency/1997Model.html) (this site contains a link to a list of adopting countries; accessed September 14, 2013).