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On the Theoretical Foundations for Regulating Financial Markets

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On the Theoretical Foundations for Regulating Financial Markets¹

Katharina Pistor²

Abstract:

How we think about financial markets determines how we regulate them. Since the 1970s modern finance theory has shaped how we think about and regulate financial markets. It is based on the notion that markets are or can be made (more) efficient. Financial markets have been deregulated when they were thought to achieve efficient outcomes on their own; and regulation was designed to lend crutches to them when it appeared that they needed support. While modern finance theory has suffered some setbacks in the aftermath of the global crisis, defenders hold that improving market efficiency should still be the overriding concern for regulation. This essay raises the question whether this is indeed the case. What if other factors besides information costs affect the vulnerability of markets to crises? Two factors have been identified in the literature: Imperfect Knowledge and the Liquidity Constraint. This essay introduces the relevant theories that focus on these factors and discusses their regulatory implications.

¹ I am grateful to Merritt Fox, Roman Frydman, Ron Gilson, Jeffrey Gordon, Edward Green, Rachel Harvey, Robert Jackson, Kate Judge, Perry Mehrling, Charles Sabel, and Zohar Goshen for comments on an earlier version of this paper. All remaining and newly accrued errors are mine.

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Table of Contents

I. Introduction	2
II. The Theoretical Foundations of Finance.....	8
A. Efficient Capital Market Hypothesis.....	9
B. Imperfect Knowledge Economics (IKE).....	15
C. Minsky's Financial Instability Hypothesis.....	22
D. The Money View of Finance	28
III. Financial Theories and Regulatory Implications	37
A. Comparing Financial Theories.....	38
B. Towards a New Approach to Financial Regulation.....	41
1. IKE's Regulatory Approach	43
2. MVF's Regulatory Approach.....	50
C. Reforming Governance or Reforming Finance.....	53
1. Responsiveness	54
2. Who Governs the Governor(s)?.....	56
3. Too complex to govern?	62
IV. Concluding Comments.....	63

I. Introduction

In the aftermath of the global crisis long-held views about financial markets have come under pressure. Questions have been raised whether financial markets are indeed efficient and whether the deregulation of financial markets that was justified by the Efficient Capital Market Hypothesis (EMH) has caused more harm than good.³ Most of the current critiques of EMH center around three issues: whether market actors are indeed rational, autonomous actors or instead beset by herd behavior;⁴ whether markets are

³ For an insightful review of these debates in different countries and how post-crisis debates relate to pre-crisis ones, see JULIE FROUD et al., *Stories and Interests in Finance: Agendas of Governance before and after the Financial Crisis*, 25 *Governance: An International Journal of Policy, Administration and Institutions* 35-39 (2012).

⁴ This critique has been articulated by the literature on behavioral finance. See, for example, GEORGE A. AKERLOF & ROBERT J. SHILLER, *Animal Spirits: How Human Psychology Drives the Economy, and Why it Matters for Global Capitalism* (Princeton University Press, 2009).

fundamentally or “informationally” efficient⁵; and whether markets or regulators are better able to make allocative decisions.⁶

This debate can be understood only within the dominant framework employed for conceptualizing financial markets. It assumes that financial markets are no different from the market for ordinary tradable goods and that, therefore, the general equilibrium models that have been developed for tradable goods apply to finance just as well. A very different perspective is offered by theories that seek to explain the operation of real world financial systems and their empirically manifested trend towards instability. The two critical ingredients that have been identified by these alternative theories are Imperfect Knowledge and the Liquidity Constraint.⁷

The insight that knowledge is imperfect can be traced back to the work of Knight,⁸ Keynes⁹ and Minsky.¹⁰ Roman Frydman and Michael Goldberg have recently extended it to their theory of “Imperfect Knowledge Economics” (IKE).¹¹ They share with

⁵ RONALD GILSON & REINIER KRAAKMAN, *The Mechanisms of Market Efficiency*, 70 *Virginia Law Review* 549 (1984) at 613.

⁶ There is broad consensus among lawyers and economists that markets are superior. For the basic theoretical argument see Louis De Alessi, *Property Rights, Transaction Costs, and X-Efficiency: An Essay in Economic Theory*, 73 *American Economic Review* 64-81 (1983). On public vs. private entities, see Aidan R. Vining & Anthony E. Boardman, *Ownership versus competition: Efficiency in public enterprise*, 73 *Public Choice* 205-239 (1992).

⁷ The concept of Illiquidity and Imperfect Knowledge Constraints are derived from the literature. I have taken the liberty to coin them in this fashion and capitalize them.

⁸ FRANK H. KNIGHT, *Risk, Uncertainty and Profit* (Houghton Mifflin. 1921).

⁹ JOHN MAYNARD KEYNES, *The General Theory of Employment, Interest and Money* (Harcourt, Inc. 1964 (1936)) at 248, explaining that investing in the future is a key aspect of capitalist economies; yet information about the past is insufficient to predict the future.

¹⁰ Building on Keynes’s work, Minsky argues that the inability to predict the future in combination with price competition leads actors in financial markets to adopt financing strategies that destabilize the system over time. See HYMAN P. MINSKY, *Stabilizing an Unstable Economy* (Yale University Press. 1986) at 230.

¹¹ ROMAN FRYDMAN & MICHAEL D. GOLDBERG, *Imperfect Knowledge Economics* (Princeton University Press. 2007); see also their most recent book, which is accessible to a broader audience, in which they restate the IKE theory and suggest some regulatory implications. ROMAN FRYDMAN & MICHAEL D. GOLDBERG, *Beyond Mechanical Markets: Asset Price Swings, Risk, and the Role of the State* (Princeton University Press. 2011). It should be noted that for now they limit their theory to macroeconomics. However, they do not preclude the possibility that the theory could be extended into a general theory of financial economics. See *ibid* at 256.

proponents of EMH the notion that fundamentals drive asset prices. Yet, according to IKE, markets do not trend towards equilibrium outcomes, as posited by EMH and its cousin, the Rational Expectation Hypothesis (REH). Instead, imperfect knowledge is responsible for almost the opposite result, namely *extreme* asset price swings. The reason is that prices do not track an assumed intrinsic value; rather, they reflect the struggle of market participants to determine asset value in light of a constantly changing environment. The reversal of asset prices can be extremely costly for the real economy, as price adjustments can trigger economy-wide deleveraging, which is associated with economic recession and, in the worst-case scenario, depression. This, in the eyes of Frydman and Goldberg, makes the case for government intervention to prevent extreme asset price swings. In the world of IKE, imperfect knowledge is an existential factor that cannot be altered and will lead to an endogenous process of extreme asset prices swings as market participants continue to pursue existing strategies until they observe many others changing strategy. Financial regulation is therefore not limited to information enhancement, but takes a more proactive stand to avoid financial crises and economic hardship.

The Liquidity Constraint has been articulated by Keynes and Minsky and is at the heart of Minsky's "Financial Instability Hypothesis".¹² It is closely intertwined with the Imperfect Knowledge Constraint. Because we have imperfect knowledge about the future, we employ financing strategies that are informed by current knowledge. However,

¹² For a review of Minsky's contribution to finance theory, see PERRY MEHLING, *The Vision of Hyman Minsky*, 39 *Journal of Economic Behavior and Organizations* 129-158 (1999). See also Mehrling's analysis of the failure of Long Term Capital Management in light of Minsky's theory. PERRY MEHLING, *Minsky and Modern Finance: The Case of Long Term Capital Management*, Winter 2000 *Journal of Portfolio Management* 81-89 (2000). Mehrling himself extends Minsky's analysis to contemporary financial markets in PERRY MEHLING, *The New Lombard Street: How the Fed Became the Dealer of Last Resort* (Princeton University Press. 2011), hereinafter Mehrling (2011a).

extrapolation from the present to the future, which is unknowable, may be off the mark. This causes market participants to radically alter their strategy when the future arrives. We may well have overestimated the ability to pay bills from earned income as they become due, or the willingness of others to refinance debt should obligations exceed current revenue. This follows from the principle of Imperfect Knowledge. When doubts about the ability of intermediaries to pay their bills or to refinance their debt spread, the Liquidity Constraint comes into its own. Refinancing current and financing future positions will be cut back, resulting in a downward price adjustment and potential deleveraging or fire sale of assets. This follows from the simple fact that, in the words of Keynes, “there is no such thing as liquidity for the community as a whole”.¹³

The end result of this process can be a financial, or worse, an economic crisis. Proponents of both Imperfect Knowledge and the Liquidity Constraint theories therefore postulate that instability of financial markets is an endogenously driven process.¹⁴ However, there are also important differences between the two approaches. According to Minsky, economic systems are a matter of social choices and institutional arrangements that may be more or less conducive to instability. In contrast, Frydman and Goldberg abstract from institutions as well as from liquidity and focus on self-correcting asset price swings as the trigger of crises, and imperfect knowledge as their root cause.

Perry Mehrling builds on Minsky’s work and places liquidity at the center of his analysis. Liquidity is elastic, with its relative elasticity being determined by the

¹³ Keynes, *supra* note 9 at 155.

¹⁴ See also JEAN TIROLE, *Liquidity and All its Friends*, 49 *Journal of Economic Literature* 287-325 (2011) at 320, suggesting that “when everyone engages in maturity transformation, authorities have little choice but facilitating refinancing, and so refusing to adopt a risky balance sheet lowers the return on equity.” It follows that there will be multiple equilibria and that contrary to Capital Asset Pricing Models (discussed *infra*), “it is in the interest of each bank to be illiquid.”

management of the overall (public and private) *credit* supply.¹⁵ The financial system is depicted as a credit system. Every unit in the economy is a bank, each with its own balance sheet comprising assets and liabilities. Assets held on the balance sheet of one unit have their mirror image in the liabilities of another. Each seeks to balance its books. When liabilities exceed assets, a unit seeks to balance assets and liabilities by deferring payments to its creditors, by seeking short-term financing to fill the gap, or by selling assets to generate cash. If all fail, it will default, forcing its creditors to make up for the difference in order to balance their own books. This in turn pushes the chain of unmatched liabilities from creditor to creditor and up the ladder of the financial system to whoever is willing or capable to step in as lender of last resort (LLR). Historically, this role has been played at times by private agents, such as Mr. J.P. Morgan in the financial crisis of 1907,¹⁶ but nowadays it is typically filled by the central bank – in the US, the Federal Reserve (the Fed).

An important motive for financial innovation and regulatory arbitrage from this perspective is the search by market actors for strategies to increase the elasticity of the Liquidity Constraint each of them faces. The task of those overseeing this system – the LLR and its agents – is to balance the elasticity of the liquidity of the system as a whole with a view on promoting growth, while avoiding high levels of volatility and destabilization.

Modern finance theory does not ignore imperfect knowledge or liquidity issues, but relegates them to subordinate roles. The Imperfect Knowledge Constraint is typically

¹⁵ This is a clear departure from the monetarists who focus entirely on the money supply. See Mehrling, *supra* note 12 at 58, but also Minsky (1986), *supra* note 10 at 182.

¹⁶ ROBERT F. BRUNER & SEAN D. CARR, *The Panic of 1907: Lessons Learned from the Market's Perfect Storm* (John Wiley & Sons. 2007).

reinterpreted as an information problem;¹⁷ and the Liquidity Constraint boiled down to a moral hazard issue, as when financial intermediaries are seeking a bailout.¹⁸ If, in contrast, the Imperfect Knowledge and the Liquidity Constraints are put at center stage, information costs are demoted to a matter of secondary importance. The Imperfect Knowledge Constraint tells us that no matter how much information is revealed *ex ante*, information about the past or present does not equal knowledge about the future. It follows that the focus on information in financial market regulation is insufficient. It may even be counter-productive because it creates the appearance that better information can convert the fundamental problem of uncertainty into a probability calculation, even though every probability calculation uses assumptions based on what we can know today, which may turn out to be wrong tomorrow.¹⁹ Worse, the belief that better information can ultimately drive markets towards efficiency may prevent legislatures and regulators from pursuing alternative, and potentially superior, strategies for governing financial markets.

The theories that invoke the Liquidity Constraint go a step further still. They suggest that neither information shortage, nor imperfect knowledge can explain the scale of financial crises we observe in the real world. Absent the Liquidity Constraint, there is no reason why assets can no longer be sold when new information is revealed and knowledge upgraded to the present. The root cause of financial crisis is that at that time there are few takers of assets, as most market participants will strive to obtain cash to pay

¹⁷ See *infra* the discussion under II.A.

¹⁸ The Liquidity Constraint can also be portrayed as an information problem. See Tirole, *supra* note 14 at 298, suggesting that one of the reasons for the breakdown of market liquidity, i.e. the ability to sell assets against cash, is information asymmetry. Note, however, that he does not limit the analysis to this point and instead suggests that endogenous market processes can result in liquidity breakdowns. See *ibid* note 16. Moreover, he concludes his analysis by pointing out that recognition of the Liquidity Constraint has regulatory implications that are not fully understood and that advancements require, among others, a convergence of micro and macroeconomics. See Tirole *supra* note 14 at 323.

¹⁹ This is essentially why the Value at Risk model that was widely followed by investors prior to the crisis went spectacularly wrong. See Frydman and Goldberg, *supra* note 11 at 244.

off their own liabilities as they become due.²⁰ They will therefore seek to sell assets and if all do the same at the same time can trigger a fire sale of assets that drives down prices across the economy.

In short, theory matters for how we regulate, because it determines how we think about markets and how we define the purpose of regulation. If there is more than one theory that helps us understand how financial markets operate and what regulation might accomplish, it is useful to consider their respective merits. To be sure, disputes over regulatory theories take a long time to resolve – often too long for legislatures or regulators who need to respond to market developments and crises immediately. However, even without a conclusive resolution of the theoretical debates, a better understanding of different theories and their regulatory implications might be helpful. Different theories may come to similar conclusions on specific issues, thereby lending greater support to a particular regulatory intervention. Moreover, having a menu of options may be superior to a fixed course, especially if the last time the fixed course was on offer emergency care was required afterwards – whether or not we can establish causality between the two events. Last, but not least, in a world of so many unknowns, experimentation with multiple regulatory strategies may result in better outcomes than placing all bets on one card.²¹

II. The Theoretical Foundations of Finance

²⁰ Keynes suggests that a collapse of equity prices “may have been due to the weakening either of speculative confidence or of the state of credit”, where the “state of credit” is defined as “the confidence of the lending institutions towards those who seek to borrow from them.” Keynes, *supra* note 9 at 158.

²¹ On this point, see ROBERTA ROMANO, *For Diversity in the International Regulation of Banking Institutions: Rethinking the Basel Architecture*, unpublished MS on file with author (2011) at 66.

This part of the essay introduces different theories of finance and their core features. We begin with the Efficient Capital Market Hypothesis (EMH), which has been the backbone of modern financial theories and regulatory approaches. We then turn to theories that use the Imperfect Knowledge and Liquidity Constraints respectively to explain the operation of financial markets. A comparison of the three theories with the greatest policy relevance today will conclude the section.

A. Efficient Capital Market Hypothesis

EMH holds that in a world without transaction and information costs markets will allocate capital to the most efficient use. Prices will incorporate all relevant information and the price mechanism will therefore ensure an efficient outcome.²² An important step in the development of EMH was an empirical observation, the famous random walk of stock prices. The fact that markets did not follow a pattern that could be predicted from price movements in the past suggested that financial markets themselves could be analyzed as competitive markets with equilibrium outcomes. After all, independence of past and present price and the implied absence of arbitrage opportunities suggested stable equilibria.²³ This “no arbitrage” paradigm, most famously stated by Samuelson in 1965,²⁴

²² Efficiency in this context is typically defined as Pareto efficiency, meaning that no further transaction will make anyone better off without making others worse off. However, given that markets in the real world do not necessarily resemble fully Pareto efficient markets, Kaldor-Hicks efficiency has become the preferred benchmark among legal academics. It requires only a net social benefit but assumes that the actual costs of different transactions and their implications can be assessed with reasonable accuracy. In combination with the notion that markets may only be relatively efficient, this leaves ample room for judgment calls and ideational debates when assessing the pros and cons of different regulatory strategies.

²³ See See PERRY MEHLING, *Financial Economics*, unpublished MS on file with author (2011) at 6. Hereinafter Merhling (2011b).

became the foundation for the new fundamental theory of asset pricing. It posited the existence of a positive linear pricing rule, implying that assets that were not yet widely traded could be priced by reference to assets that were.²⁵ This gave rise to financial engineering and the development of sophisticated financial instruments, including over-the-counter (OTC) derivatives that were priced and sold even in the absence of an already existing market.²⁶

EMH and the theorem of “no arbitrage in efficient markets” did not remain without doubters. Samuelson himself disclosed in his original paper that he had hesitated to publish the theorem for almost ten years. When he did eventually publish it he warned against drawing far-reaching normative implications. In his words, the efficiency theorem

does not prove that actual competitive markets work well. It does not say that speculation is a good thing or that randomness of price changes would be a good thing. It does not prove that anyone who makes money in speculation is *ipso facto* deserving of the gain or even that he has accomplished something good for society or for himself. All or none of these may be true, but that would require a different investigation.²⁷

²⁴ See PAUL A. SAMUELSON, *Proof that Properly Anticipated Prices Fluctuate Randomly*, 6 *Industrial Management Review* 41-49 (1965) at 44: “... there is no way of making an expected profit by extrapolating past changes in the future price, by chart or any other esoteric devices of magic or mathematics. The market quotation (...) already contains in itself all that can be known about the future and in that sense has discounted future contingencies as much as is humanly possible (or inhumanly possible within the axiom of the model).”

²⁵ See Mehrling (2011a), *supra* note 12 at 7. See also DONALD MACKENZIE, *An Engine, Not a Camera: How Financial Models Shape Markets* (The MIT Press, 2006) at 139/140, suggesting that the no arbitrage principle was further developed by Cox and Ross into a “general, elegant account in which option prices were determined by the absence of arbitrage opportunities. (...) For Ross, models of stock prices and option theory were not separate endeavors. (...) Assets that were substitutes for each other – stocks with the same sensitivity to underlying risk factors; and option and its replicating portfolio – had to have the same price, for otherwise there was an arbitrage opportunity.”

²⁶ See Mehrling, *supra* note 12 at 7. Note that OTC derivatives are customized and therefore lack the standard features otherwise presumed to be critical for the development of a deep and liquid market in financial instruments. The rise of the OTC derivatives markets is therefore closely associated with the widely shared belief that the price of these papers can be inferred from other assets. For a powerful argument for how finance theory has shaped the way financial markets operate, see MacKenzie, *supra* note 25, invoking the concept of performativity to suggest that markets came to resemble the models that were used to explain them. Specifically on the random walk theory and the EMH, see *ibid* at pp. 57.

²⁷ Samuelson, *supra* note 24 at 48.

These warnings were to little avail. Whether he had intended to or not, Samuelson had transformed an empirical observation into a general theorem, the Rational Expectation Hypothesis (REH). The end result was a “normative theory” of asset markets, according to which, in the words of Frydman and Goldberg,

barring informational asymmetries and other market failures, markets populated by rational individuals *are stable*, in the sense that they set prices to fluctuate randomly around intrinsic value.²⁸ (emphasis added)

Legal academics, judges and regulators quickly absorbed this theory, which has come to deeply inform financial market regulation in the US and elsewhere.²⁹ In a seminal paper published in 1984, Professors Gilson and Kraakman explained the critical role law and legal institutions play in enhancing market efficiency.³⁰ The SEC used EMH as a reference point for developing its integrated disclosure strategies for securities markets.³¹ Last, but not least, the US Supreme Court embraced EMH in 1988 in its “Fraud on the Market Theory”:

The fraud on the market theory is based on the hypothesis that, in an open and developed securities market, the price of a company's stock is determined by the available material information regarding the company and its business. (...) Misleading statements will therefore (...) defraud purchasers of stock even if the purchasers do not directly rely on the misstatements. (...) The causal connection between the defendants' fraud and the plaintiffs' purchase of stock in such a case is no less significant than in a case of direct reliance on misrepresentations.³²

²⁸ Frydman and Goldberg, supra note 11 at 94.

²⁹ The primary transmission channel to other parts of the world has been the standardization of financial regulation on ‘best practice’ models as exemplified by the US. See KATHARINA PISTOR, *The Standardization of Law and Its Effect on Developing Economies*, 50 *American Journal of Comparative Law* 101-134 (2002).

³⁰ See Gilson and Kraakman (1984) supra note 5 at 549-50, suggesting that even at the time of their writing, EMH already informed academic literatures, had made inroads into legal textbooks and was structuring debates about future securities regulation.

³¹ For details, see PAOLO CIOPPA, *The Efficient Capital Market Hypothesis Revisited: Implications of the Economic Model for the United States Regulator*, 5 *Global Jurist Advances Article* 3 (2005).

³² *BASIC INC. v. LEVINSON*, 485 U.S. 224 (1988) at 255; Note that the Supreme Court insists that it is not assessing the validity of the theory, only whether lower courts were correct in invoking it.

In short, investors could rely on prices as the carrier of all relevant information. They were therefore able to charge directors who had failed to disclose what appeared to be valuable information with fraudulent conduct, even when the investors were unable to show that they had taken note of and acted upon any specific piece of information, such as an oral or written statement, but instead had *relied* on the market price.³³

EMH has survived crises and crashes, the possibility of which it rules out categorically. After all, efficient markets are supposed to be stable; they trend towards equilibrium, not disequilibrium. Crises therefore have to be attributed to exogenous effects, i.e. to events outside the financial system, which are typically characterized as shocks to the system rather than evidence of flaws in the theory used to describe and analyze it.³⁴ Alternatively, the causes for a crisis must be found in information inefficiency, such information asymmetries between borrowers and lenders.³⁵

One of the most ominous aspects of EMH has been the notion of “intrinsic value”. Judges have grown increasingly wary of what that might be and how it should be determined.³⁶ Some of this was already apparent in the dissenting opinion by Justice White in the Supreme Court case that was decided in 1988:

At the bottom of the Court's conclusion that the fraud-on-the-market theory sustains a presumption of reliance is the assumption that individuals rely "on the integrity of the market price" when buying or selling stock in "impersonal, well-developed market[s] for securities." (...) it is this aspect of the fraud-on-the-

³³ Reliance is a critical component in proving causality between misleading facts and harm. Effectively, EMH paved the way for securities class action suits in cases where market prices changed considerably after the disclosure of sensitive facts.

³⁴ The 1987 stock market crash was thus attributed to electronic trading patterns; financial crises in emerging markets to bad institutions and regulatory ineptitude; the dot com crash to a few ‘bad apples’; and the subprime mortgage crisis to government policies aimed at increasing home ownership.

³⁵ Foundational for this argument see Joseph Stiglitz & Andrew Weiss, *Credit Rationing in Markets with Imperfect Information*, 71 *American Economic Review* 393-410 (1981).

³⁶ See PAUL A. FERRILLO et al., *The less than efficient Capital Market Hypothesis: Requiring more Proof*, *St. John's Law Review* 78 (2004), suggesting the courts are asking for more proof than the original formulation of the fraud on the market theory, though ambiguous, might have suggested.

market hypothesis which most mystifies me. (...) [I]t implicitly suggests that stocks have some "true value" that is measurable by a standard other than their market price. While the scholastics of medieval times professed a means to make such a valuation of a commodity's "worth," I doubt that the federal courts of our day are similarly equipped.³⁷

For most advocates of EMH, its power derives from scientific truths.³⁸ They would therefore reject scholasticism as unscientific. Yet, the duality of intrinsic and market value is built into the theory and is not an invention of judges or scholastics. EMH postulates that market prices reflect what the equilibrium outcome *would be* in a world consistent with the basic assumptions of the Rational Expectation Hypothesis.³⁹ Eugene Fama, the originator of the random walk theory, himself conceded that in competitive markets there is sufficient disagreement to make the determination of the intrinsic value elusive.⁴⁰ Nonetheless, he posited that, in accordance with the Rational Expectation Hypothesis, prices *should be assumed* to fluctuate around intrinsic value.⁴¹

The wide support of EMH in legal quarters may strike some as surprising. In its strongest form EMH makes law superfluous and should therefore drive lawyers and academics in the fields of corporate or securities law out of business or law schools. After all, if the market prices all relevant information, then all investors have to do is track that price. Any further protection is either useless or distorts the operation of the market. However, this conclusion follows only if markets have already achieved efficiency. If, in contrast, markets are not quite efficient but could be engineered to become more so, then there is a central role for law and lawyers. Specifically, law can help explain why markets

³⁷ Supra note 32 at 255. Emphasis added.

³⁸ See Gilson and Kraakman (1984), supra note 30 at 549, who begin their elaboration with a long review of the overwhelming empirical evidence that financial markets suggest efficient outcomes.

³⁹ Frydman and Goldberg, supra note 11 at 65.

⁴⁰ See EUGENE FAMA, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 Journal of Finance 383-417 (1970) at 65. See also Frydman and Goldberg, supra note 11 at 93, quoting him.

⁴¹ Frydman and Goldberg, supra note 11 at 94.

may appear as if they were efficient, even though real world experience teaches us that transaction and information costs stand in the way of full efficiency. That is the contribution Gilson and Kraakman made in their 1984 piece in which they argued that specific institutional mechanisms contribute to the *relative* efficiency of markets.⁴² Moreover, if it turns out that markets don't always act efficiently, lawyers can pave the way for making them more efficient.⁴³ Once legal scholars had demonstrated that markets need crutches to become efficient and had identified a series of useful support mechanisms, the field of law was open for designing regulation, analyzing regulatory failures, and suggesting regulatory reforms – all in view of *making* markets efficient.

The main argument in support of EMH even after the global crisis is that markets are not born efficient, but that they can be made relatively efficient by institutional and legal crutches.⁴⁴ How this altered concept of efficiency squares with the original EMH assumption that markets are efficient and *therefore* stable remains unexplained. If markets are only informationally efficient do they tilt towards equilibrium or fragility? Is this outcome socially desirable, and if so, why? Recall Samuelson's warning that the proof of the theorem of market efficiency had nothing to say about its normative desirability. Presumably he would have been even more skeptical about the notion that relatively efficient markets are social welfare enhancing.

⁴² They distinguish typologies of trading based on the level and source of information available to them. They also suggest that different mechanisms operate in different markets to make them efficient. For details, see Gilson and Kraakman, *supra* note 30 at esp. Figure One at 590.

⁴³ See the discussion of policy implication in RONALD J. GILSON and REINIER KRAAKMAN, *The Mechanisms of Market Efficiency Twenty Years Later: The Hindsight Bias*, 28 *Journal of Corporation Law* 715-742 (2003) at 738.

⁴⁴ Critically, however, on over-reliance of regulation to enhance market efficiency, Jonathan R. Macey, *The Value of Reputation in Corporate Finance and Investment Banking (and the Related Roles of Regulation and Market Efficiency)*, 22 *Journal of Applied Corporate Finance* 18-30 (2010).

The standard answer to these questions by adherence of the EMH is that regulators will be no better and arguably worse at allocating resources than markets. That, of course, assumes that there are only two ways of governing financial markets: enhancing efficiency through institutional design or taking over decision making from market actors in a move akin to central planning associated with the socialist system, now in demise. In contrast, the theories discussed below suggest that there is room, indeed a need, for alternative institutional and regulatory approaches, and that it may be time to move beyond the simple state vs. market dichotomy in the debate about financial regulation.

B. Imperfect Knowledge Economics (IKE)

Imperfect Knowledge Economics uses a very different point of departure than EMH, namely that markets are inherently unstable. “Instability is an inherent feature of capitalist economies, perhaps nowhere more markedly so than in modern financial markets”.⁴⁵ Long swings in asset prices, which frequently lead to “painful shifts in consumption and investment patterns”,⁴⁶ are manifestations of this instability. The major objective of IKE therefore is to explain observable swings in asset prices.

IKE also postulates that market participants are aware of the fact that financial systems are inherently instable and that knowledge is imperfect.⁴⁷ This is why, contrary to modern finance theory, market actors do not operate as robots following a single strategy to the end irrespective of any headwinds or other obstacles. Instead, rational individuals devise strategies to deal with imperfect knowledge on a day-to-day, minute-

⁴⁵ Frydman and Goldberg (2011), *supra* note 11 at 1.

⁴⁶ *Ibid.*

⁴⁷ In the book they devote an entire part to presenting empirical evidence that is consistent with this postulate. See Chapter 7, “Keynes and Fundamentals”, *ibid* at 117-147, esp. at 129.

to-minute basis as they adjust their trading and investment strategies. These strategies lie at the heart of empirically observable long-term swings in asset prices, which can wreak havoc on financial and economic systems if allowed to swing excessively. In light of these realities, the attempt by financial economics to capture complex economic systems with mechanical, predetermined and fully specified models – namely EMH and REH – is deemed futile.⁴⁸

The starting point of this analysis is a rather conventional definition of what financial markets do. They “provide assessments of the relative prospect of companies’ assets”; “set prices” to reflect “expected return on past investments” as well as “new investments for which new capital is sought”; and “allocate capital based on these price signals”.⁴⁹ Most EMH proponents would agree with this definition. Where IKE departs from EMH is in its emphasis on two features of contemporary markets: “nonroutine change” and “imperfect knowledge”.

In modern economies, individuals and companies engage in innovative activities, discovering new ways to use existing physical and human capital, and new technologies. The institutional and broader social context within which this entrepreneurial activity takes place also changes in novel ways. And innovation itself influences the future returns from economic activity in ways that no one can fully foresee.⁵⁰

Imperfect knowledge both follows from and explains nonroutine change. Because economic change is nonroutine, investment decisions are also “inherently nonroutine”.⁵¹

⁴⁸ Frydman and Goldberg liken it to attempts by central planners in the former socialist world to run their economies on similarly pre-specified models – without much success. “Yet Western economists seemed undeterred by the failure of central planners to comprehend and shape the future as if history unfolded according to fully predetermined mechanical rules. They set out to construct mathematical models that accurately capture how financial markets assess the prospects of alternative investment projects and companies not only today but for all past and future periods as well.” Ibid at 46.

⁴⁹ Ibid at 150.

⁵⁰ Ibid at 46.

⁵¹ Ibid at 41.

Nonetheless, individuals invest in the expectation of future returns, which makes corrections inevitable at some point in the future when knowledge is enhanced. These corrections themselves constitute nonroutine events with potentially disruptive effects not only for the financial system, but also for the real economy.

IKE agrees with proponents of EMH – and by implication disagrees with at least some proponents of behavioral economics – that market participants act purposefully when they invest. However, they cannot know the future and cannot simply extrapolate it from the past; they can use existing information and knowledge to devise a strategy to follow until new information becomes available or events occur that demand change. This is the reason that traders and analysts are constantly hunting for new information and for clues to assess its relevance: it helps them to determine whether to stick to a strategy or abandon it. The prices generated in this fashion represent the relative value of different assets at a given moment in time. The asset value in turn influences a unit's access to finance.

In the aggregate, the purposeful behavior of all traders exhibits regularities. Yet, because of imperfect knowledge and nonroutine change these regularities can “become or cease to be relevant at times that cannot be fully specified in advance”.⁵² The tipping point occurs when enough traders begin to change the strategy they had devised earlier, if only cautiously. If and when followed by others, this change in direction can move asset prices market-wide – until a sufficient number of traders changes course again.

These insights have led Frydman and Goldberg to dismantle the Rational Expectation Hypothesis (REH) and its cousin, the Efficient Market Hypothesis (EMH). REH states that the behavior of market participants “will ensure that asset prices reflect nearly

⁵² Ibid.

perfectly their *mythical* true longer-term values, thereby ensuring nearly perfect allocation of society's capital".⁵³ They call the true long-term value "mythical" because it cannot be known to individuals or the "market", or even to academic economists. Yet, for economists to derive consistent models (which has become the mantra of academic finance), the assumption that markets can be reliably forecasted is crucial. An important implication is that market participants "never revise their forecasting strategies in ways that they, or an economist's Rational Expectation model, have not foreseen."⁵⁴

EMH too is rejected as "castles in the air".⁵⁵ EMH asserts that prices reflect all (publicly) available information. An asset's inherent or true value is derived from the net present value of its current and future investment projects. Calculating this value assumes that market participants know future prices and dividend changes⁵⁶ – when in fact they do not and *cannot* know them.

While for standard economics a rejection of REH and EMH amounts to depriving financial markets of their very purpose, IKE suggests, to the contrary, that if EMH held true there would be little reason for financial markets to exist. The very purpose of financial markets, their *raison d'être*, is the assessment of assets and the allocation of resources in a world of imperfect knowledge with non-routine change. Markets may not be perfect, but they "are the best institutions on offer".⁵⁷ In the words of Frydman and Goldberg,

there is something fundamentally absurd about the Efficient Market Hypothesis. It is based on the idea that individuals are profit seeking, but it supposes that the

⁵³ Ibid at 15. Emphasis added.

⁵⁴ Ibid at 58.

⁵⁵ Ibid at 81.

⁵⁶ Ibid at 91.

⁵⁷ Ibid at 228.

masses of market participants who do use available information in an effort to earn above-average returns are merely wasting their time.⁵⁸

As an alternative, Frydman and Goldberg propose the Contingent Market Hypothesis (CMH), which states that

[T]he causal process underpinning price movements depends on available information, which includes observations concerning fundamental factors specific to each market. (...) This process cannot be adequately described by an overarching model, defined as a rule that exactly relates market outcomes to available information up to a fully predetermined random error at all time periods, past, present, and future.⁵⁹

As this definition suggests, CMH emphasizes the processes by which new information or events make their way into the pricing of assets. This is accomplished by a dynamic interplay of short-term speculative traders and long-term value investors. Speculators are concerned with short-term returns and base their trading decisions on “news about short-term trends”, but on “a wide array of fundamental factors”.⁶⁰ Their time horizon hardly extends beyond the coming months or quarters and they focus on “clues about returns on companies’ shares”.⁶¹ They include company-specific information, i.e. earnings, sales and costs, as well as information about the state of the economy, such as “future interest rates, inflation, and other fundamental factors that influence companies’ short-term prospects”.⁶²

In comparison, long-term “value” investors buy stocks that they believe are undervalued and hold them for an extensive period of time.⁶³ They too cannot know how

⁵⁸ Ibid at 197.

⁵⁹ Ibid at 198.

⁶⁰ Ibid at 158. This is backed by an analysis of thirteen years of Bloomberg wrap reports that contain qualitative information about which factors drive market behavior on a given day.

⁶¹ Ibid at 154.

⁶² Ibid.

⁶³ Note, however, that empirical evidence cited in the text suggests that annual turnover by value investors, such as growth and mutual income funds, can easily exceed 70 percent. Ibid at 158, note 3.

the value of an asset will change over the time period they intend to hold it, no matter how many resources they put into background research. This is where speculative investors come in. Short-term investors respond to new information and events and thereby help track the “unfolding prospects of projects and companies”.⁶⁴ The short-term trading activities help validate or falsify the bets long-term investors made by indicating how these bets might materialize. Speculators benefit value investors in other ways as well: They are the ones who buy their newly appreciated shares and thereby ensure that they can realize their value.

Thus, far from turning an asset market into a casino,⁶⁵ or endangering the stability of the system by introducing speculative elements as Minsky argued, according to Frydman and Goldberg short-term speculative investors play a valuable, if paradoxical, role in financial markets.

The debate has largely failed to recognize that speculation is inherent to how financial markets perform their essential role in modern economies, which would imply the need to focus on harnessing speculation to improve capital allocation and curbing excesses that might cause a future crisis.⁶⁶

The need to curb excesses does not follow from some inability of markets to self-correct. Frydman and Goldberg argue that they can and will do so eventually as more and more traders revise their trading strategy in light of new information, events, or in a

⁶⁴ Ibid at 159.

⁶⁵ As Keynes famously suggested. He criticized US financial markets for emphasizing speculation over value investment. “When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done”. Keynes, *supra* note 9 at 159. He continued by pointing out that this tendency had already been institutionally entrenched: “These tendencies are a scarcely avoidable outcome of our having successfully organized “liquid” investment markets.” Ibid.

⁶⁶ Frydman and Goldberg (YEAR), *supra* note 11 at 150. I am grateful to Roman Frydman for pointing out to me that this conclusion has close affinity to the characterization of auxiliary derivatives markets by Gilson and Kraakman. See *supra* note 50 and accompanying text. Indeed, as will be further discussed below, REMH and IKE have greater affinity with one another than with the mores structuralist approaches represented by Minsky and Mehrling.

reflexive mode⁶⁷ because others have done so. However, this self-correction may come too late. Traders are motivated by profits and as long as they observe information about fundamentals that supports the continuation of a bullish trend, they will continue to bid up the price of assets, even if they believe it to be excessive. They can do so because they do not internalize the “economic and social costs associated with such excesses”.⁶⁸ This is where the state, law and regulation come in: “This externality, then, rationalizes a role for the state in asset markets beyond setting the rules of the game”.⁶⁹

In short, EMH and IKE are both concerned with the causes of disorder, where disorder is defined as the deviation of asset prices from some benchmark.⁷⁰ For EMH the benchmark is an idealized norm, such as a stable equilibrium outcome, or some intrinsic value (if only assumed). IKE rejects an idealized norm and offers as an alternative the empirically observable historical range of asset prices.

An interesting question is how IKE and REMH relate to one another. Both theories reject the notion of “intrinsic” value and take a more pragmatic approach for analyzing and assessing market developments. For Gilson and Kraakman, EMH serves as a benchmark for assessing informational efficiency, whereas Frydman and Goldberg use historical data to determine extreme asset price swings. The two theories differ, however, in their take on financial stability vs. instability. As discussed, Gilson and Kraakman do not explicitly address the question of stability, but they seem to assume that the more informationally efficient markets are, the more stable they ought to be. This explains their

⁶⁷ Frydman and Goldberg reference Soros’ theory on the reflexivity in financial markets. For a concise statement of this theory see GEORGE SOROS, *The Crash of 2008 and What it Means* (Public Affairs, Perseus Group, 2009) at 25.

⁶⁸ Frydman and Goldberg (2011), *supra* note 11 at 15.

⁶⁹ *Ibid.*

⁷⁰ See Mehrling (2011a), *supra* note 12.

regulatory approach, namely to further reduce information costs. In contrast, Frydman and Goldberg assume instability as an inherent feature of financial markets. Extreme asset price swings are not caused by a shortage of information, and informational remedies will therefore be ineffective. Instead, they are produced by endogenous processes that are associated with the decentralized valuation of assets in an ever-changing world. The major purpose of regulation is to coordinate the correction of investment strategies before asset prices reach extreme levels. This will be further discussed *infra* under III.

C. Minsky's Financial Instability Hypothesis

Just as IKE, Minsky's Financial Instability Hypothesis (FIH) starts from the notion of uncertainty. Minsky developed his theory on the basis of Keynes's insight expressed in his "General Theory"⁷¹ that capitalism owes its existence, vibrancy, but also its tendency to destabilize, to a financial system. Capitalist economies not only trade, they also produce; more importantly, they invest. This makes a financial system indispensable, indeed foundational, for capitalism. For Minsky, uncertainty is part and parcel of every investment decision. The decision to invest involves a "supply function of investment, which depends upon labor costs and short-term interest rates, a demand function of investment, which is derived from the price of capital assets, and the *anticipated* structure and conditions of financing".⁷² This implies that there is an "element of uncertainty in the decision to invest that has nothing to do with whether the investment will perform as the technologists indicated and whether the market for the product of the investment will

⁷¹ See Keynes, *supra* note 9 at 153.

⁷² Minsky (1986), *supra* note 10 at 207. Emphasis added.

be strong. This element of uncertainty centers on the mix of internal and external financing that will be needed”.⁷³

Financing means the exchange of money now against commitments to pay in the future. Such commitments come in different forms, including notes, bonds, shares, deposits, and insurance policies. Some are short-term, others are long-term; some have a fixed time horizon, others an open time horizon. The list of financial instruments or capital assets is open-ended. Financial innovation, i.e. the creation of new financial instruments, is a hallmark of market based credit systems, in which individual market participants need to balance their own accounts, yet face the constant threat that one or more of its borrowers or counter parties might default. In good times close substitutes to cash relax the survival constraints of individual players. In bad times, however, all payment commitments and all financial instruments must be convertible into cash.⁷⁴

The main motivation for financial innovation, according to Minsky, is profit, which can be generated by managing capital assets. Capital assets are expected to yield income, or quasi-rents – i.e. the difference between the total revenue generated from selling output of current goods and the actual out-of-pocket costs for the production of such goods.⁷⁵ Only when quasi-rents are realized within the expected time frame can the costs of financing and producing these goods be covered from income. Otherwise refinancing becomes necessary.

⁷³ Ibid.

⁷⁴ For a more detailed exposition of this point see the discussion of the Money View of Finance, *infra* at D.

⁷⁵ Ibid at 200.

Minsky follows Keynes's argument that in the process of financing investments and taking positions on capital assets, money is created.⁷⁶ As long as bankers and firms believe, based on information available to them, that the investments or quasi-rents derived from capital assets will finance the payments due on debt, they will be inclined to make funds available for new investments or for refinancing, and in the process they produce more money. Conversely, when their views change, finance will be cut back. At the aggregate level, these actions result in an increase or decrease in the supply of money – i.e. in claims that are, in principle, convertible into cash.

The fact that the act of financing *produces* money has important implications for the functioning of the pricing system for capital assets. In Minsky's view, the basic static model with intersecting supply-demand curves used to explain the pricing system for current goods misses core features for the pricing of capital assets. Neither can pricing of capital assets be reduced to the allocation of resources (as assumed by proponents of EMH) or the distribution of income. Rather, "in a capitalist economy resource allocation and price determination are integrated with the financing of outputs, positions in capital assets, and the validating of liabilities".⁷⁷ In other words, the cost of financing affects asset prices.

The structure of financial commitments and the types of cash flow used to meet obligations as they become due are critical for determining the relative stability of an economic system. Minsky argues that there are essentially three types of cash flow:

⁷⁶ Ibid at 131. In support he quotes Keynes's essay "The Consequences to the Banks of the Collapse in Money Values" in *Essays in Persuasion: Collected Writings of John Maynard Keynes*, Vol. 9 at 151.

⁷⁷ Minsky (1986), *supra* note 10 at 159. Note that Minsky owes this insight to Kalecki. See HYMAN P. MINSKY, *Can "It" Happen Again? Essays on Instability and Finance* (Sharpe. 1982) at xix.

income, balance sheet, and portfolio.⁷⁸ Income cash flow results from the process of production and includes wages and salaries, payments for intermediate and final goods, and gross profits after taxes. Balance sheet cash flows are used to meet existing liabilities, both principal and interest.⁷⁹ Lastly, portfolio cash flows result from financial assets changing hands: The buying or selling of assets and the issuance of new liabilities generates portfolio cash flows.

How individual “units” (households, firms, municipalities, the government) and the economy as a whole prioritize among these different forms of cash flows to meet their obligations determines the degree of a system’s financial (in)stability. A stable economy is one in which most entities use income cash flows most of the time to meet payment commitments on the outstanding liabilities. Minsky calls this “hedge financing”. When the balance sheet cash flows are larger than the expected receipts from income, the unit will have to engage in speculative or even Ponzi finance. Speculative finance describes a situation where borrowing becomes necessary to meet current obligations, but it is expected that future cash receipts will cover cash payments. Speculative finance morphs into Ponzi finance when it is expected that future obligations can be met only by raising new capital.

Every financing scheme is vulnerable to the possibility that the Liquidity Constraint turns out to be less elastic at the time when payments need to be made than was presumed at the *ex ante* stage. This follows from imperfect knowledge. However, Minsky

⁷⁸ Minsky (1986), *supra* note 10 at 223.

⁷⁹ The flows per dollar of liability vary depending on the duration of financial instruments: The shorter the duration of financial instruments, the greater the balance-sheet cash. This follows from the fact that short-term interests tend to be lower than long-term interests. Balance sheet cash flows can be further divided into dated, demand and contingent cash flows reflecting the specific contractual arrangements that underpin them. *Ibid.*

emphasizes that the degree of instability varies for different forms of financing. Hedge financing is vulnerable “only” to miscalculations about the amount of actual receipts coming in at a future date – i.e. to changes in the performance of the firm or the overall trajectory of economic development. In contrast, speculative and Ponzi financing are also vulnerable to the more volatile developments of financial markets.⁸⁰ This is an important difference to IKE, which (as discussed) does not address the Liquidity Constraint.

While financing strategies are essentially a matter of choice and can be influenced by appropriate institutional design, the tendency to destabilize is inherent to any financial system in a capitalist economy. In a system in which hedge financing dominates, introducing speculative elements, i.e. offering short-term finance at higher interest rates, can create a competitive advantage.⁸¹ This in turn increases the demand for and thus the value of assets and leads to capital gains. Where capital gains are earned today *and* are expected in the future, speculative finance is more readily available as capital gains are expected to cover any difference between the liabilities and future income. When economic conditions allow for the repeated rollover of debt, competitive pressures ensure that more and more units shift to speculative finance. Thus, “profit opportunities within a robust financial structure make the shift from robustness to fragility an endogenous phenomenon”.⁸² The contrast to EMH could not be more clearly stated. Whereas EMH supposes that markets will approach equilibrium outcomes, the FIH predicts the opposite: Markets will trend towards instability. Absent proactive intervention this can lead to major financial and economic crises.

⁸⁰ Ibid at 231. In Mehrling’s terms this affects the relative elasticity of liquidity.

⁸¹ Ibid at 234.

⁸² Ibid.

Once individual units are no longer able to refinance their debt and, as a result, expectations based on past experience that debt obligations will be met in the future are no longer validated, the amount of liquidity in the financial system decreases. Banks and other financial intermediaries will cut back on lending and refinancing as their own survival constraint forces their hand. A series decline in liquidity triggers a major downward adjustment of asset prices throughout the economy, which can turn into an economic recession or depression. Transposed into the conceptual world of IKE this implies that liquidity shortage triggers swings in asset prices.⁸³

To avoid this outcome, central banks typically offer lender of last resort facilities: They signal that they stand ready to buy or accept as collateral any assets that are no longer marketable.⁸⁴ In essence, the Fed refinances the debt private entities have incurred; in doing so it provides liquidity to the system. Following Keynes, Minsky argues that this is precisely what central banks should do.⁸⁵ Such an intervention, however, does not come without costs. Not only do taxpayers have to stand in for the losses, the intervention creates moral hazard problems as market actors begin to rely on future bailouts. Minsky's answer to this problem is not to refrain from bailouts. Instead he suggests that the adequate response is regulatory reforms that address the causes of instability.⁸⁶

The central bank virtually assures that there will be another crisis in the near future unless, of course, it outlaws the fragility inducing financial practices. Clearly, central bank lender-of-last-resort interventions must lead to legislated or administered changes that favor hedge finance.⁸⁷

⁸³ See also Keynes, *supra* note 9 at 159.

⁸⁴ Minsky (1986), *supra* note 10 at 43.

⁸⁵ *Ibid* at 49-52.

⁸⁶ *Ibid* at 101.

⁸⁷ *Ibid* at 364.

Mirroring the structure of financial systems at the time of his writing, Minsky devotes most of his attention to banks, the “central financial organization of a capitalist economy”.⁸⁸ This may no longer be accurate in today’s market-based credit system. Still, Minsky defines banks very broadly: Any entity that creates and markets financial instruments, not only to those entities, which, because of some legal convention, are labeled “banks”. The distinction between banks and thrift institutions, different types of money managers or investment banks, and so forth, can be attributed to historical accidents. Their codification into a typology of regulated financial entities may stand in the way of an adaptive response to a changing economic environment.⁸⁹ The focus of regulation, therefore, should not be a specific entity, but any moneymaking activities that may destabilize the system. Minsky details his policy recommendation in the final part of his book, where he calls for comprehensive reform of institutions that include not only banks and other financial intermediaries, but the competitive structure of the economy, the tax system and the corporate sector.⁹⁰

D. The Money View of Finance

Minsky’s theory was largely ignored by modern financial economics.⁹¹ The primary reason was that he built on an intellectual tradition that was increasingly regarded as outmoded; one that drew on central bank practices and learning in the earlier parts of the

⁸⁸ Ibid at 354.

⁸⁹ Ibid at 252.

⁹⁰ Ibid at 317. Specifically he notes that “we have to go back to square one – 1933 – and build a structure of policy that is based on a modern understanding of how our type of economy generates financial fragility, unemployment, and inflation.” Ibid at 323. The specific policy recommendations are not detailed here, because they are somewhat remote from the financial and economic system we have today – which evolved further along the lines of instability and did not heed Minsky’s advice.

⁹¹ For an insightful account of Minsky’s work in their impact on policies and economic theory see MEHRLING (1999), *supra* note 12.

20th century.⁹² Mehrling himself builds on that very same tradition, which he has labeled the “money view” to differentiate it from the “finance” and the “economic” view. As defined by him, the “finance view” focuses on the valuation of assets as is the case for EMH. The “economic view” focuses on social welfare, in particular on how investments made by past generations affect the prospects of the present generation. This is the domain carved out for macroeconomics, which traditionally has been distinct from finance.⁹³ In contrast, the “money view” focuses on the operation of the complex money system that links households and firms to brokers and dealers, and these intermediaries to the entities capable of producing high-powered money – i.e. to the monetary authorities.

(B)oth economics and finance abstract from money; for both of them, money is just the plumbing behind the walls, taken for granted. Both largely ignore the sophisticated mechanism that operates to channel cash flows wherever they emerge, to meet cash commitments wherever they are most pressing. As a consequence, neither the economics view nor the finance view has been particularly well suited for understanding the crisis we have just been through, a crisis during which the crucial monetary plumbing broke down, almost bringing the rest of the system down with it.⁹⁴

It follows that to understand the financial crisis the plumbing behind the walls must be brought into daylight, analyzed, and understood. The basic building blocks of the money system are shiftability, the central role of dealers, the function of arbitrage, and the role of a backstopper to the system: A lender or even a dealer of last resort. In the following each of these elements will be discussed in turn.

Shiftability means the ability to sell on demand an asset for cash to meet one’s obligations. The ability to shift assets in order to raise cash has been a core feature of the American banking system long before the establishment of the Federal Reserve System.

⁹² See Mehrling (2011a), supra note 12 at 15.

⁹³ On these intellectual roots, see Mehrling (2011b) supra note 23.

⁹⁴ Mehrling (2011a), supra note 12 at 4-5.

Whereas in England banks would fund their liquidity needs by raising short-term commercial loans (bills of exchange) that were “self-liquidating”, in the US the highly volatile agricultural sector created strong seasonal fluctuations in the demand for credit and the ability to convert claims into cash on demand.⁹⁵ US banks met that demand for liquidity primarily by lines of credits with other banks; when that source of liquidity dried up, they used high quality bonds in their portfolio as collateral for loans, or sold them on the market.

Such shiftability depended ultimately on security dealers and other speculators being willing to buy the assets that banks wanted to sell, and so-called speculative credit was always the lifeblood of the dealer business. Thus, paradoxically, it was speculative credit, not productive credit, as the source of liquidity for most American banks in the years before the Fed.⁹⁶

The framers of the 1913 Federal Reserve Act were well aware of these practices. According to Mehrling, they recognized and at the same time sought to create outer bounds for shiftability by declaring that the Fed would only discount commercial loans, i.e. that only these loans were shiftable to the Fed as the ultimate provider of cash.⁹⁷ Yet, the Act did not rule out any of the practices (investing in different asset classes and using one to make up for shortcomings in another) that facilitated shiftability. The implication was that assets that were not shiftable to the Fed remained shiftable in private markets. They were useable in private markets and facilitated the expansion of credits. As Mehrling put it, “private credit elasticity is *always* a substitute for public credit elasticity”.⁹⁸ The stock market crash in 1929 laid barren the stark difference between private and public shiftability. When shiftability in private market ceased, i.e. when

⁹⁵ Ibid at 31.

⁹⁶ Ibid at 34.

⁹⁷ Ibid.

⁹⁸ Ibid at 14.

sellers no longer found buyers for the papers, liquidity dried up, converting a problem of illiquidity into one of insolvency. Yet, the Fed stuck to the principle of discounting only commercial loans. It therefore stood on the sidelines as the complex system of privately provided market liquidity went into reverse, bringing with it an economy-wide depression.⁹⁹

Dealers, the second institutional pillar in contemporary financial markets according to the MVF, are an indispensable feature for shiftability. Unlike brokers, dealers take assets and the credit risk associated with them onto their own books. For this service they charge a premium, and they make profits on the difference between this premium and the discount rate the Fed will charge them should they need to shift assets to the Fed for liquidity purposes. The framers of the original Federal Reserve Act believed that the system would be self-enforcing: By clearly drawing a line between shiftable and non-shiftable assets, it was hoped that the law would induce market participants to internalize the costs of non-shiftable assets at the upper end of the chain. Yet, the profit opportunities associated with shiftability proved too tempting.¹⁰⁰ To see this, consider how a dealers market operates.

A dealer takes assets on her own book. She quotes bid and ask spreads to others with a view of balancing her own risk and profitability. She finances the positions in these assets by raising funds in another market, in our own days typically the repurchase or

⁹⁹ Ibid at 42.

¹⁰⁰ From the perspective of an individual investor, shiftability is highly desirable because it allows him to convert liquidity holdings into cash whenever he desires. However, shiftability increases the fragility of financial systems, because the ability to sell assets may vanish when downward adjustments to past expectations become necessary. As Keynes put it succinctly, “There is no clear evidence from experience that the investment policy which is socially advantageous coincides with that which is most profitable.” Keynes, *supra* note 9 at 157.

Repo market,¹⁰¹ using the assets as collateral. By carefully managing the term structure arbitrage of her portfolio, the dealer can make a profit. As long as the dealer has access to the repo market, to bank loans as a kind of lender of last resort for dealers,¹⁰² or to the Fed, the risk inherent in dealership can be mitigated. If and when these sources of liquidity dry up, the system unravels. To fully appreciate the critical role of dealers in a world with the Liquidity Constraint, it is useful to contrast it with a hypothetical world without it. This is how Mehrling describes such a world:

Then, so long as the expected profit on the term structure was positive, dealers would have an incentive to increase leverage, buying bonds and selling bills. Competition among dealers would drive expected profit on the term structure arbitrage to zero, and the expectations hypothesis would come into its own. (...) [I]t is a world in which there is no survival constraint, hence no liquidity risk, hence no liquidity premium in asset prices. It is a world without dealers.¹⁰³

This is not the world we live in. Nor can such a world be explained in terms of informational asymmetries; that may work for brokers who are pure intermediaries, but not for dealers who take the risk of the underlying asset, including the liquidity risk, onto their own balance sheet. The Fed, in turn, lubricates the private dealer system by participating directly in the repo market for Treasuries.¹⁰⁴ Since dealers and other market participants use Treasuries as collateral, these interventions directly affect liquidity, and hence prices, in other asset markets as well.

¹⁰¹ The repo, or repurchase market, is a bankers' market for short-term loans in which they sell assets and repurchase them within hours or days. It is similar to a collateralized loan, but differs in that the title to the asset formally changes hand, only to be transferred back at the end of the loan period. See Mehrling (2011a), *supra* note 12 at 34. There are no interest rates, but the sale and buy prices are adjusted to accomplish the same economic result. The beauty of a repo from the point of view of regulatory arbitrage is that it is not classified as a loan and thus is not subject to reserve or capital requirements.

¹⁰² *Ibid* at 103.

¹⁰³ *Ibid* at 100-101.

¹⁰⁴ Mehrling (2011a), *supra* note 12 at 99.

Two things follow. First, money and capital markets are deeply intertwined;¹⁰⁵ primary dealers with direct access to the Fed are critical links in this system. And second, according to the money view of finance (MVF), liquidity is a critical determinant of asset prices.¹⁰⁶

Shiftability can be enhanced by creating new tradable assets. This is the essence of financial innovation and regulatory arbitrage. Recall Samuelson's famous dictum that efficient capital markets are characterized by "no arbitrage".¹⁰⁷ In contrast, MVF can be interpreted to suggest that in a world governed by the Liquidity Constraint arbitrage is a defining feature, and the major purpose of financial innovation is to create new arbitrage opportunities in order to enhance liquidity elasticity.

Take the example of the currency swap. It was designed to circumvent capital controls under the Bretton Woods system. The currency swap allowed firms to gain access to foreign capital by swapping loan obligations in different currencies so that technically no capital crossed borders.¹⁰⁸ It is only a step from here for a bank with branches in both countries to offer firms from these markets a dealer service for a fee by accepting the default risk of either party in the transaction. Further, the bank may want to hedge its risk by entering into a forward market with yet another bank. The only reason

¹⁰⁵ The interdependence of money and capital markets has deep historical roots. In order to meet higher demand for credit during agricultural sowing periods, banks would build reserves during low demand periods and send excess reserves to New York where they provided cheap funds for stock market speculation. "The result was a regular seasonality in interest rates, punctuated by regular financial crises in 1873, 1884, 1893, and finally 1907." Ibid at 32.

¹⁰⁶ In contrast, Frydman and Goldberg argue that asset price swings determine the availability of capital to finance it. "The financial markets provide assessments of the relative prospects of companies' assets. (...) Markets allocate capital based on these price signals: the higher the price of a company's asset, the easier it is for it to attract financial capital, whereas lower prices make financing more difficult." Frydman and Goldberg (2011), *supra* note 11 at 149.

¹⁰⁷ See *supra* note 25 and accompanying text.

¹⁰⁸ The simplest way to achieve this outcome is for two companies in two different countries to create subsidiaries in the other country and for one parent to loan domestic currency to the subsidiary of the other parent. For a more elaborated discussion of this scenario, see Mehrling (2011a), *supra* note 12 at 72-75.

this other bank will be willing to engage in such a transaction is that it expects to make a profit, which it does if and when “the forward exchange rate is greater than the realized spot exchange rate”.¹⁰⁹ Modern finance theory holds that it should not be possible to make money on these transactions, because under equilibrium conditions the return from two different investment strategies should be identical.¹¹⁰ Yet, in reality counterparties in swap transactions do make money because they carry “the risk involved in absorbing mismatch in the currency swap market”.¹¹¹ This is essentially a liquidity risk, which markets price, but which modern finance theory simply ignores.

The currency swap is only one in a whole series of financial innovations for the purpose of regulatory arbitrage. Another example is Regulation Q, which stipulated an interest rate ceiling savings and loans associations could pay on their deposit liabilities.¹¹² The strategy around this restriction was to design a new financial vehicle to which this restriction would not apply and to make money by attracting more deposits. According to Mehrling, this was “the origin of the money market mutual fund”.¹¹³ Another important invention has been the credit default swap, which allows the separation of interest rate risk, default risk, and the risk of devaluation of the underlying asset. Specifically, the issuer of CDS assumes the default risk and makes a profit from the differential between the insurance premium he charges and the expected costs for delivering cash or risk-free assets in the event of default. These deals are structured as implicit rather than explicit loans to avoid triggering reserve and capital adequacy rules.

¹⁰⁹ Ibid at 76.

¹¹⁰ Ibid, explaining that this is the core of UIP, the “uncovered interest parity” proposition.

¹¹¹ Ibid at 77.

¹¹² Ibid at 89. Regulation Q was part of Title 12, part 217 of the [United States Code of Federal Regulations](#). The interest rate ceiling was in effect between 1933 and 1986. For details of the history and (lack of) effectiveness of the regulation, see Alton R. Gilbert, *Requiem for Regulation Q: What It Did and Why it Passed Away*, Federal Reserve Bank of St. Louis 22-37 (1986).

¹¹³ Ibid.

As such, swaps provided a neutral way to get around regulations designed for traditional bank balance sheets, regulations that typically scaled both required reserves and required capital to the size of the balance sheet. Here is the origin for the so-called shadow banking system.¹¹⁴

The most important source of stability for a financial system built on shiftability and dealers is the availability of a lender or even dealer of last resort, i.e. an agent willing and able to offer cash for assets that are no longer shiftable in private markets. Because it is the ultimate guarantor of liquidity, the LLR sits at the core of a system of interdependent financial claims. “[I]n effect, the central bank realizes the survival constraint by providing current cash flow to allow borrowers to delay the day of reckoning”.¹¹⁵ Prior to the global crisis, the Fed had developed the practice to “always lends freely”, but “only to primary security dealers, only against Treasury security collateral, and only at the Treasury repo rate that corresponds to the target Fed Funds rate”.¹¹⁶ The hope that by limiting shiftability to the Fed markets would internalize the risks they took by creating private sources of shiftability proved to be mistaken yet again. In the aftermath of the fall of Lehman Brothers private credit contraction was sufficiently severe for the Fed to expand the range of parties it was willing to lend to and the type of collateral it was willing to accept and put on its own balance sheet.

The result was, first, a hollowing out of the Fed’s balance sheet as it sold off its Treasury securities (to the former lenders) to fund new loans (to the former borrowers), and an explosion of the Fed’s balance sheet as it expanded its deposit liabilities (to the former lenders), and used the proceeds to fund additional lending (to the former borrowers).¹¹⁷

¹¹⁴ Ibid at 82.

¹¹⁵ Ibid at 17.

¹¹⁶ Ibid at 27.

¹¹⁷ Ibid at 28.

The Fed adapted its response to the crisis to the market structure that had evolved under its stewardship. In the new world of a capital-market-based credit system,¹¹⁸ where even commercial banks have morphed from lenders into dealers, the central bank itself became a Dealer of Last Resort (DLR).

In effect, the Bagehot principle can be understood as recommending that the central bank post a wide bid-ask spread in the money market and use its balance sheet to absorb the resulting flow of orders. This is more or less exactly what the Fed did in the various emergency liquidity facilities that it opened in response to the crisis.¹¹⁹

This outcome was far from inevitable. Rather, Mehrling attributes it to the thinking of monetary policy makers in the years leading up to the global crisis. Specifically, the dominance of EMH in financial economics and the dynamic stochastic general equilibrium (DSGE) model in macroeconomics furthered policies aimed at producing the very equilibrium outcomes theoretical models predicted, but markets were not producing on their own.

Monetary policy came to be seen as a matter of making liquidity in the real world the free good that it was in ideal theory. The result was a systematic bias toward ease by the monetary authorities, systematic bias that private speculators were only too happy to exploit for private profit. In effect, the monetary authorities became partners with the private speculators in a quixotic drive to make EH as true in reality as it was in theory.¹²⁰

This intellectual framework ensured that policy makers ignored asset prices. After all, markets were believed to set the “natural” interest rate plus some expected inflation. Price stability, not financial stability, was the overriding concern, and for that the index

¹¹⁸ This system has also been termed “shadow banking system”. See ZOLTAN POZSAR, et al., *Shadow Banking*, 458 Federal Reserve Bank of New York Staff Reports (2010) for a detailed account of how it operates.

¹¹⁹ Mehrling (2011a), supra note 12 at 28.

¹²⁰ Ibid at 91. Note that EH stands for “Expectation Hypothesis”, specifically the EH of the term structure, which states that “the return on a long-term bond should be just an average of expected short-term interest rates over the life of the bond.” Ibid at 49.

of consumer prices was deemed sufficient.¹²¹ According to Mehrling, this policy stand has proved disastrous: “[I]f the Fed fails to raise interest rates in the face of a credit-fueled asset price bubble, the bubble will feed on itself, growing ever larger and having ever greater distorting effects, until it bursts”.¹²² To see why, recall how the dealer system operates. The cheaper it is to fund liquidity for dealers with access to the Fed lending facilities, the greater their incentives to leverage themselves and offer cheap market liquidity to private borrowers. This is the mechanism through which low (Fed) funding rates translate into high asset prices. The effects were (predictably from MVF) particularly pronounced for fairly illiquid assets not supported by a two-way dealer system, such as home loans.

To summarize, MVF can be described as a further development of Minsky’s FIH and its adaptation to 21st century finance. Banks are no longer the central agents in finance, markets are; in this new market-based credit system dealers take center stage as liquidity providers. Having allowed this system to evolve to the breaking point, the Fed had no option but to evolve from (only) a lender into a dealer of last resort. In short, Mehrling attributes the crisis in large parts to governance failures and these failures to an intellectual climate that favored the finance view over an institutionally founded money view of the financial system.

III. Financial Theories and Regulatory Implications

How we think about financial markets determines how we regulate them. It should therefore not be surprising that the different theories lead to different regulatory

¹²¹ Ibid at 110.

¹²² Ibid 111.

strategies. Table 1 below summarizes how the four theories introduced above depict financial markets and the regulatory implications they draw.

Table 1: Comparing Theories and their Regulatory Implications

	(R)EMH	IKE	FIH	MVF
Function of financial markets	Resource allocation	Resource allocation under conditions of uncertainty	Resource allocation under conditions of uncertainty and illiquidity	Management of illiquidity risk in interconnected dealer market
Pricing in financial markets	EMH: Pricing of intrinsic value; REMH information costs implies relative, not absolute efficiency	Pricing under conditions of uncertainty can create extreme asset price swings	Pricing integrated with the financing of outputs, positions in capital assets, and the validating of existing liabilities	Pricing influenced by liquidity; expansion and/or shift in liquidity creates asset price booms; reversals in liquidity trigger collapse of asset prices
Regulatory Implications	Improve (relative) information efficiency	Guidance range and excess dampening to prevent extreme asset price swings	Reform economic institutions to promote hedge financing	Manage system-wide money supply by monitoring asset prices

A. *Comparing Financial Theories*

The different conceptions of financial markets are reflected in the function they are deemed to serve (Row 1). EMH and IKE see the primary purpose of financial markets in the allocation of scarce resources to productive use. However, IKE points out that resource allocation may be suboptimal because it takes place under conditions of imperfect knowledge. FIH agrees, but pushes the argument a step further: Pricing in financial markets is determined not only by uncertainty or imperfections in our ability to forecast the future, but also by the Liquidity Constraint. Because it is impossibility to convert all claims into cash at any given moment, markets operate under the Damocles Sword of a reversal in liquidity. MVF shares this position. Examining the complex

market-based credit system that characterizes finance today, it suggests that liquidity drives both upswings and downturns in asset prices: When extra liquidity becomes available because liquidity is shifted from one market to another or a new class of tradable assets is created, asset prices go up. When liquidity dries up, financial intermediaries can be forced to conduct a fire sale of assets to meet their own obligations, thereby triggering a collapse in prices.¹²³ In a world of highly interconnected two-way dealer markets, the main function of financial markets is the for-profit management of liquidity.

It follows that the four theories have different perspectives on how financial assets are priced and how the pricing affects the market's stability. For EMH the pricing mechanism is at the heart of its efficiency postulate. In its strong form, EMH postulates that prices incorporate all relevant information and thus lead to the efficient allocation of resources – a state where no transaction is possible that would make one party better off without making another party worse off. When information is not costless, a fully efficient outcome cannot be achieved; nonetheless, by managing information costs, relative efficiency is deemed achievable.¹²⁴

According to IKE prices that are created in this fashion can experience abrupt swings with dire consequences for the financial markets and the economy as a whole. The reason is that investment decisions are not only impeded by information costs; they are affected by fundamental uncertainty about what the future holds. This implies that corrections in

¹²³ A historical example is the regular boom and bust of asset prices on the New York Stock Exchange in the 19th century. When their own reserves were too high, banks that were financing agriculture, with its seasonal cycles and thus different financing needs, would send spare cash to New York to be invested in the stock market. “The result was a regular seasonality in interest rates, punctuated by regular financial crises in 1873, 1884, 1893, and finally 1907”. Ibid at 32.

¹²⁴ Gilson and Kraakman (1984) supra note 30 at 557.

asset prices may become necessary. This is why markets are inherently instable; and the larger the correction the more dire the consequences.

FIH and MVF agree that changes in the future are likely, but these changes are not triggered by updates to our knowledge alone. Instead, they are directly linked to the availability of liquidity. Minsky argues that the pricing mechanism in financial markets is fundamentally different from the pricing mechanism for ordinary goods.¹²⁵ It is determined not simply by the demand and supply for that good, but also by the availability of liquidity. If positions in capital assets can be easily refinanced today, financing for new investments is more easily available than if past claims become invalidated by a history of default. As Mehrling points out, in a world of market-based credit systems based on the constant shiftability of assets, liquidity becomes a primary driver of asset prices. Every entity in this system is constantly seeking to balance its own balance sheet, taking positions often financed with debt, thus relying on funding liquidity, and liquidating others to generate instant cash, taking advantage of market liquidity under the threat of its own survival: The ability to meet obligations as they become due. As long as there are enough takers for existing assets they can be converted into cash upon demand. If that is no longer feasible, markets and prices collapse.

On the way up, ample funding liquidity in private money markets supported the extension of market liquidity into previously uncharted territory, and that extension supported collateral valuations that supported further extension of funding liquidity. On the way down, the same reinforcing cycle worked in reverse. This is the inherent instability of credit, twenty-first century edition.¹²⁶

The regulatory implications follow directly from these theories. For EMH and its close cousin, REMH, it is all about information costs; for IKE it is managing the

¹²⁵ Minsky (1986), *supra* note 10 at 159. Note that Minsky owes this insight to Kalecki. See *ibid* at xix. See also Mehrling (1999), *supra* note 12.

¹²⁶ Mehrling (2011a), *supra* note 12 at 130.

imperfect knowledge constraint. In contrast, Minsky advocates a wholesale transformation of economic institutions to more stable financial structures, and correcting deviations from them, which are to be expected given the inherent drive of markets towards instability. Mehrling takes a less radical view on regulation. He does not advocate comprehensive institutional reforms, but governance mechanisms that are attuned to the Liquidity Constraint.

B. Towards a New Approach to Financial Regulation

The regulatory strategies that follow from REMH are straightforward and sufficiently familiar so that they will not be further elaborated here.¹²⁷ The critical issue is information costs and a fear that over-regulation might foreclose arbitrage opportunities and other strategies market actors use to deal with informational frictions. In contrast, from the perspective of FIH, the event of a crisis suggests the need for far-reaching institutional reforms that should encompass not only the financial system, but the entire economic system.¹²⁸ Finance and the economy at large are viewed as deeply intertwined. They therefore need to be reformed in tandem to ensure that a more stable system emerges in the aftermath of a crisis. Such a far-reaching reform agenda has rarely been realized as the political obstacles are significant. A partial exception is the New Deal in the US – although Minsky criticizes even these reforms as being beholden mostly to pre-

¹²⁷ For a comprehensive account of specific regulatory techniques, see Gilson and Kraakman (1984), *supra* note 30; note, however, that in their more recent work they eschew the temptation to list specific mechanisms and instead reassert the principles of regulation aimed at reducing information costs.

¹²⁸ See Minsky (1986), *supra* note 10 at p. 328, calling for an integrated reform agenda that includes government spending and taxation, an employment strategy, financial reform and market power: “The policy problem is to devise institutional structures and measures that attenuate the thrust to inflation, unemployment, and slower improvements in the standard of life without increasing the likelihood of a deep depression.”

Keynesian thinking and insufficiently attuned to the inherent instability of finance.¹²⁹ As Minsky himself realized, an important reason for the lack of impetus for comprehensive reforms that might render a more stable system is the role the central bank has come to play during crises. Its interventions mitigate the effects of the crisis, thereby undermining the political resolve for the kind of corrections that would be needed to stabilize the unstable economy. The legislative answer to the financial crisis in the US, the Dodd-Frank Act, confirms this. It seeks to offer greater protection for consumers and introduces macro-prudential risk management, but leaves the financial and economic system as it existed prior to the crisis largely intact.¹³⁰

Approaches to regulation that move beyond EMH, yet do not call for the comprehensive institutional overhaul Minsky proposed, can be found in the two remaining theories, IKE and MVF. The subsequent analysis will focus on them rather than FIH for two reasons to explore whether there is a middle ground between overhauling the structure of our financial and economic system on one hand, and pretending that except for some information problems all is well in the world of finance.

IKE and MVF both suggest that effective governance of financial markets requires substantially more than reducing information costs. They require proactive regulatory strategies to prevent crises. Both theories view modern economies and financial systems as highly dynamic and suggest that markets rapidly adapt to new regulation. As a result, predetermined static modes of regulation will be outdated soon after being enacted. Both

¹²⁹ Ibid.

¹³⁰ For a highly accessible summary of the key reforms of the Dodd-Frank Act, see DAVID A. SKEEL, *The New Financial Deal* (John Wiley & Sons, 2011). Skeel suggests that the reforms have gone much further, in particular by increasing the scope of discretionary power of key regulators, most notably the Treasury. However, he does not assert that this has resulted in a major overhaul of the financial or economic system. From Minsky's perspective the invocation of the New Deal in the title (*The New Financial Deal*) is nonetheless apt: Just as the New Deal was behind the new, Keynesian, economic thinking that emerged at the time, the New Financial Deal is beholden to intellectual frameworks that predate the crisis.

theories therefore call for governance regimes that give substantial discretion to regulators. This raises important questions about who governs these governors.¹³¹ We will return to this question infra under 3. First, we need to clarify the regulatory implications that follow from IKE and MVF respectively, and where and why they might differ from one another. To do so, the following two subsections pitch the two theories against one another. IKEs' approach to regulation is summarized first, but interspersed with reactions that follow from the logic of MVF. Roles are switched in subsection 2 and MVF takes the lead as IKE responds.

1. IKE's Regulatory Approach

For IKE, the major objective of regulation is to address the problem of instability that results from imperfect knowledge and nonroutine change. Frydman and Goldberg do not believe that government agents are better equipped at making allocative decisions than markets. Nor do they think that they have superior information or knowledge. They certainly do not suggest that government agents should substitute for markets. Instead, the purpose of regulation is to manage an inherently instable system, which because of this inherent instability should not be presumed to allocate resources well.¹³² This should be done by way of “guidance range” and/or “excess dampening” measures.¹³³

Guidance range is meant to signal to the market that it has well exceeded historical benchmarks in asset price movements. While the computation of these benchmarks is

¹³¹ This problem is a perennial issue in governance debates. See only JOSEPH STIGLITZ, *Quis Custodiet Ipsos Custodes* (The World Bank, 1999).

¹³² Frydman and Goldberg (2011), *supra* note 11 at 81: “As it stands, the Efficient Market Hypothesis says very little about how prices unfold over time, or whether markets allocate capital well”.

¹³³ For details, see *ibid* at Chapter 12, 217.

contestable, the use of data offers some check on the discretion of regulators.¹³⁴ Policymakers should monitor asset price development and announce publicly and with reasons given when the market overshoots significantly.¹³⁵ The primary purpose of this announcement is not to add additional information: According to Frydman and Goldberg, most market participants today are well-informed and will realize when price swings have reached extremes.¹³⁶ Instead it “may help coordinate their [i.e. market participants’] views around official assessments in much the same way that the inflation targets set by central banks do for inflation expectations”.¹³⁷

From the perspective of MVF these measures are useful in that they ensure that regulators will actually monitor asset prices. However, they are likely to be insufficient. As long as liquidity remains highly elastic, i.e. as long as market participants find dealers willing to shift their assets for a reasonable liquidity premium, they will continue to bid up asset prices irrespective of any guidance range announcements. Moreover, those with access to liquidity even after an asset price swing has occurred – specifically, those with direct access to the Fed funding facilities or to investors with big pockets, like Sovereign Wealth Funds or Warren Buffet – are less likely to respond to such guidance range because they operate under a different survival constraint. Yet, they are the ones with potentially the biggest impact on asset prices.

¹³⁴ According to Frydman and Goldberg it would be possible to determine a moderate range of asset price swings, say of 90 percent, by determining the 5th and 95th percentiles of an extended time window of several decades. Ibid at 230.

¹³⁵ See *ibid* at 236, arguing that officials would have to disclose the analysis that goes into these announcements. Note that this approach dovetails to some extent the call for deliberative governance espoused by experimental governance discussed *infra* under 3.

¹³⁶ In fact, they offer empirical insights based on how market participants assess different economic factors over time using “Bloomberg Professional”, a database kept by Bloomberg News. See *ibid* at 129.

¹³⁷ *Ibid* at 234. In this context it should be noted that the Fed did not previously make public the inflation target it had set for itself. See GRETA A. KRIPPNER, *Capitalizing on Crisis* (Harvard University Press, 2011) at 129-134.

In fact, from the MVF perspective guidance range may be the least effective where it is most needed. Excess liquidity tends to have the least impact on highly liquid markets and the most on those that are illiquid.¹³⁸ During boom times new credit facilities and rising asset prices attract dealers to new markets. By offering two-way dealer services they foster greater liquidity of assets that have hitherto been largely illiquid. An example is the market for securitized mortgages to finance housing. When liquidity dries up and the bubble bursts these markets are often the first markets to fail.¹³⁹ Critically, these new markets may be too young to offer long-term historical data for purposes of guidance range.

In addition to guidance range, IKE proposes a more proactive governance strategy, namely the dampening of excessive price swings. This suggests that Frydman and Goldberg are well aware that guidance range alone might be insufficient. A specific policy recommendation associated with excess dampening is counter-cyclical capital requirements. They recommend that these measures should be stratified to ensure that financial intermediaries with strong exposure to particular markets, such as housing, are required to take additional safeguards.¹⁴⁰

MVF does not oppose capital requirements, but from its perspective one would caution against relying on them too heavily. First, they guard primarily against default,

¹³⁸ See Mehrling (2011a), supra note 12 at 119.

¹³⁹ See *ibid* at 119, suggesting that during the global financial crisis, the first market to collapse was the market for asset-backed commercial papers (ABCP). Importantly, the source of market liquidity did not lie in the assets themselves. “The underlying securitization tranches were designed to be held, not traded. (...) If there is no trading then where are the prices supposed to come from?” *Ibid* at 126. The answer to this question is the insurance markets, or the market for CDS. The shadow banking system was buying insurance on the upper tranches of ABCP and selling insurance on the lower tranches. This made them the source of market liquidity, *ibid* at 129, but at the same time exposed them to “basis risk,” *ibid* at 128 – i.e. the hedging ratio between the two assets. Yet, the investment bankers themselves believed that they were balancing the books when in fact they were “spreading market liquidity in the high tranches into the lower tranches, taking on liquidity risk of their own”. *Ibid* at 130.

¹⁴⁰ They point to Spain’s dynamic provisioning, which has helped protect Spain’s largest banks in the crisis, yet failed to protect Spain’s regional savings banks, the *caixas*. *Ibid* at 245/6.

not illiquidity;¹⁴¹ and while illiquidity may lead to default, it need not do so, at least not if short-term illiquidity problems can be effectively addressed. Moreover, past experience suggests that their efficacy is often undermined by regulatory arbitrage. Indeed, the evolution of financial markets and the pace of financial innovation suggests that attempts to constrain credit growth by imposing capital or reserve requirements can push market participants to find ways to formally comply while making sure that their disposable assets are in fact not much curtailed. Swaps, CDS and other instruments have been used for these purposes; indeed some have suggested that the primary function of CDS has been regulatory arbitrage.¹⁴² One implication is that capital adequacy rules may have been ineffective; even more problematic, additional sources of liquidity risk were created in response to capital adequacy requirements. Critically, these risks remained largely unrecognized by financial intermediaries and regulators alike.

Monetary policy is another policy tool that could be used as an excess-dampening measure.¹⁴³ One such tool is interest rates, but Frydman and Goldberg caution that they may be effective in influencing asset prices only in the short term. More tribute is given to the Fed's innovative quantitative easing policies during the crisis, which, according to Frydman and Goldberg, affected interest rates more directly and with longer lasting effect.¹⁴⁴ For Mehrling, the interventions by the Fed are not so much about interest rates. Indeed, he questions whether interest rates are the mechanism by which monetary policies affect asset prices:

¹⁴¹ See also Tirole, *supra* note 14.

¹⁴² See Romano (2011), *supra* note 21.

¹⁴³ Frydman and Goldberg (2011), *supra* note 11 at 240.

¹⁴⁴ *Ibid* at note 23, 241: "The Federal Reserve's quantitative-easing measures, including the purchase of longer-term Treasury bonds and mortgage-backed securities issued by government-sponsored companies like Fannie Mae and Freddie Mac, has a direct impact on mortgage rates".

Monetary policy works, in the first instance, by affecting the behavior of dealers not banks, and by pushing around asset prices not bank lending. Maybe eventually the lending mechanism kicks in, but on a time scale much longer than the daily survival constraint that is at the center of a money view perspective.¹⁴⁵

Instead, he argues that when the Fed eases funding conditions it directly affects the behavior of primary dealers. They will change the prices they quote on Treasury bills and bonds to manage their own order flows. In doing so they affect others in the system, who in turn will adapt their price quotes. The dealer system transmits changes in liquidity at the top throughout the system. As a result, the prices of “corporate bonds, mortgage-backed securities, even foreign securities¹⁴⁶ are directly affected by the Fed’s intervention in the Treasury market. In a similar vein, MVF views the innovative interventions by the Fed during the crisis not so much as measures to affect long-term interest rates, but as actions of a dealer – the dealer of last resort.¹⁴⁷ By effectively insuring assets that were no longer sellable in the market the Fed supported the price of other assets that also depended on liquidity.¹⁴⁸

In addition to guidance range and excess dampening, IKE offers a new take on rating agencies. Much attention has been paid to the possibility that collusion between rating agencies and banks whose products (such as collateralized debt obligations, or CDOs) they assess may bias the rating.¹⁴⁹ While such collusion cannot be ruled out entirely, IKE suggests an alternative explanation for why rating agencies have been so frequently so far

¹⁴⁵ Mehrling (2011a), supra note 12 at 102. Note that in this account the “lending mechanism” would reflect changes in interest rates.

¹⁴⁶ Ibid.

¹⁴⁷ Ibid at 125: “The Fed was moving the wholesale money market onto its own balance sheet, stepping in as dealer of last resort for the money market”.

¹⁴⁸ Ibid.

¹⁴⁹ See, for example, JOHN COFFEE JR., *Gatekeepers: The Professions and Corporate Governance* (Oxford University Press, 2006); EDWARD I. ALTMAN et al., *Regulation of Rating Agencies, in* *Regulating Wall Street: The Dodd-Frank Act and the New Architecture of Global Finance* (Viral V. Acharya et al. eds., 2011).

off the mark.¹⁵⁰ Given the pervasiveness of imperfect knowledge and nonroutine change, rating agencies too are affected. Their ratings are based on assumptions that are informed by current knowledge, which, as we have seen, may turn out to be wrong in light of actual developments. To ensure that investors don't blindly follow ratings but are reminded of their inherent imperfection, Frydman and Goldberg argue that they should not only disclose their assumptions, but offer at least two sets of ratings: One that is based on one set of assumptions, and another based on modified assumptions.¹⁵¹ This would enable individual traders to assess which of the ratings is closer to their own perception of the world. It would thus play a similar coordinative role as the guidance range announcements of the central bank discussed above.

Rating agencies do not feature prominently in MVF. The theory is about the plumbing of the financial system, the ebbs and flows of liquidity and the central role of dealers at the chutes of the system. A possible shortcoming is that this underestimates how factors other than the supply of credit might affect liquidity. An argument could be made that credit rating agencies contributed to making liquidity more elastic by furthering the appearance that assets, such as securitized mortgages or CDOs, were safe for investment. This allowed pension funds and other investors to acquire such assets and enhanced their shiftability.

Where rating agencies enter MVF, at least indirectly, is where most of the action takes place according to this theory, namely on the balance sheet of financial

¹⁵⁰ The global crisis is not the first financial crisis that triggered scrutiny of rating agencies. Rating agencies were berated for failing to anticipate the currency crisis in East Asia in the late 1990s and the dot-com crisis of the early 2000s. See Coffee (2006), *supra* note 163.

¹⁵¹ Note that under the Dodd-Frank Act (The "Wall Street Reform and Consumer Protection Act" or Dodd-Frank) (H.R. 4173), rating agencies will have to disclose the assumptions on which they base their ratings. What exactly they have to disclose, however, has been left to regulatory implementation and, as of this writing, is still under consideration at the Treasury. See (932(s)(3)(B)(iii) codified at 15E(s)(3)(B)(iii).

intermediaries. Mehrling points out that both the shadow banking system and the investment bank dealer system “were net buyers of AAA protection”¹⁵² for the upper tranches of CDOs in their portfolio. This implies that rating agencies had a role in designating the tranches these agents were selling or holding. Yet, for MVF the critical question is not the rating as such, but the counterparty question. Since assets on the balance sheet of one party must find a mirror image on the liability side of another, the critical question becomes, if most players in the financial system were buying protection for AAA tranches, who was selling?¹⁵³

As it turned out, these were traditional bond insurers, such as MBIA, Ambac and the Financial Products Division of AIG. Their own risk models suggested that the probability of default for AAA rated papers was extremely unlikely and that, therefore, they could charge an insurance premium essentially for nothing. The problem in this calculation was not primarily that they miscalculated risk (although they did that too), but that they misunderstood their role and that of CDS in the financial system.

And yet, their willingness to provide AAA protection was completely essential to the system; without it, dealers would not have been able to square up their CDS books and, hence, would not have been able to provide the market liquidity on which the entire system depended. The insurers were getting money for something, but without realizing what that something was.¹⁵⁴

In essence, they were insuring for liquidity, whereas their models had only contemplated default. This misconception is arguably not addressed by IKE’s proposal to require rating agencies to issue several ratings based on different assumptions. A possible

¹⁵² Mehrling (2011a), supra note 12 at 128.

¹⁵³ Ibid.

¹⁵⁴ Ibid.

strategy to reconcile the two views would be to require rating agencies to rate not only default, but also liquidity risk.

2. MVF's Regulatory Approach

MVF's approach to regulation is still in the early stages of development and not as specific as that of IKE. Still, several principles of regulation emerge from this theory. MVF eschews the distinction between finance and money as well as between micro and macro that is so deeply engrained in conventional thinking about the financial system. For MVF they are not separable, neither in good nor in bad times. They belong to the same plumbing system and feed directly into each other. This is why the Fed's monetarist policy, which calibrated money supply to reflect an ideal demand for liquidity, had such far-reaching and ultimately disastrous consequences for the financial system. According to Mehrling, Monetary Walrasianism motivated the Fed to supply "liquidity as a free good" in the hope that this would induce markets to approximate equilibrium outcomes.¹⁵⁵ At the same time as the Fed focused on controlling the money supply, it gave private markets free range in the supply of credit without acknowledging the interdependence between the two. "Thus, the natural thrust toward fragility was amplified, not dampened, by the operations of the financial authority".¹⁵⁶

According to MVF, any attempt to reform the governance of finance must therefore start with the Fed. The crisis has forced it into the role of DLR and future reforms must start from here. "We are not going to start from scratch, so our reforms had better engage with the system as it is, not as it was or as we might wish it to be in some ideal world".¹⁵⁷

¹⁵⁵ Mehrling (2011a), supra note 12 at 65.

¹⁵⁶ Ibid at 70.

¹⁵⁷ Ibid at 113.

Yet, to adequately respond to the system as it has evolved, a profound retooling of the Fed’s conceptual framework is required to avoid embarking on another “quixotic” venture that will contribute to rather than prevent the destabilization of financial markets.¹⁵⁸ Specifically, according to MVF, the Fed should continuously monitor *all* asset prices and tailor its policies and direct market interventions to the dynamics of liquidity these data reflect. The need to monitor all asset prices follows from the fact that it is impossible to determine *ex ante* when and for which asset classes a liquidity crunch will occur.¹⁵⁹ This can be interpreted as a nod towards IKE, but with emphasis on monitoring liquidity.

Moreover, the Fed should oversee both funding and market liquidity.¹⁶⁰ Funding liquidity refers to the ability of private dealers to “borrow in the money market in order to finance their market-making operations in capital markets”.¹⁶¹ The monitoring of funding liquidity should extend to Repo as well as Eurodollar markets, because the Fed is the *de facto dealer* of last resort for these markets. The need to monitor market liquidity follows from the recognition during the crisis that interventions aimed at guaranteeing funding liquidity on its own did not ensure market liquidity.¹⁶² In the diagnosis provided by MVF, private dealers translate funding liquidity in money markets into market liquidity by borrowing in money markets to finance their positions. Effective monitoring must keep an eye on both sides of this equation – funding liquidity and market liquidity.¹⁶³

¹⁵⁸ See supra note 134 and accompanying text.

¹⁵⁹ The money view does not tell us which asset prices to watch, since the dynamic can occur in commodities, financial assets, and even real assets such as land and houses: “[W]e’ve got to be watching them all”. Mehrling (2011a), supra note 12 at 110.

¹⁶⁰ Ibid at 137.

¹⁶¹ Ibid at 26.

¹⁶² Ibid at 137.

¹⁶³ On the importance of liquidity in explaining financial markets outcomes, see also Tirole, supra note 14.

MVF does not suggest that the Fed should substitute for private actors – except in extreme cases, as in wartime or major financial crises. Specifically, even though money markets and capital markets may be intertwined, the Fed should not set the price for capital market products. Instead, it should set a floor for them, “which in normal times should be some distance away from the market price”.¹⁶⁴ Neither is it the role of the Fed to eliminate the risk dealers face. The most important function the Fed should perform is to signal to markets that – contrary to the Fed’s past policies – liquidity is not a free good. This would help “establish an arena within which private calculation of expected profit and risk makes sense”.¹⁶⁵

From the vantage point of IKE, these recommendations are not much different from “guidance range” or “excess dampening”. The price floor for securities could be characterized as MVF’s version of IKE’s guidance range; and the establishment of “bounds” for market participants within which they make their decisions about how to allocate resources is MVF’s version of “excess dampening”. Note, however, that the purpose of the monitoring and governance efforts differs in the two accounts. Whereas IKE is concerned with managing imperfect knowledge, MVF regards liquidity as the overriding policy concern. IKE therefore places much (though not exclusive) emphasis on incentives to push away from the brink, whereas MVF stresses the need to directly affect the hydraulics of the money system, i.e. the ups and downs of liquidity. Nonetheless, the similarities between the two approaches suggest that the same regulatory

¹⁶⁴ Mehrling (2011a), *supra* note 12 at 137

¹⁶⁵ *Ibid* at 138. Somewhat ironically, this is where MVF and modern financial economics seem to agree. Both believe that active policy intervention is required to ensure that markets can operate properly. However, the theoretical foundations are different. Whereas REH and EMH assume that deviations from ideal markets are the result of frictions that these interventions should address, MVF seems to follow Minsky’s view that markets are social constructs. The choice is between quixotic and socially useful markets. See Minsky (1986), *supra* note 10 at 10 and 320.

regime might serve both goals. Moreover, as the previous discussion has suggested, the two approaches are not mutually exclusive. It may therefore be useful to pursue both.

C. Reforming Governance vs. Reforming Finance

This section explores in greater detail what impact the insights derived from IKE and MVF would have for the governance of finance. We lump the two accounts together in this final analysis, because there is sufficient overlap in the regulatory implications between them. As the constructed dialogue between IKE and MVF in the previous section suggests, the proponents of both IKE and MVF maintain that regulating the financial systems they describe is feasible and both put a lot of weight on the central bank as the chief regulator. Neither, however, offers a full blown account of how an effective regulatory regime would look like that would be true to the challenges they describe while also being compatible with basic principles of self-ordering in democratic polities.

Governing an unstable financial system under conditions of imperfect knowledge and illiquidity raises difficult questions about the proper design of governance regimes.¹⁶⁶ The major objective for such a regime would have to be to guard against financial instability while promoting innovation and financial expansion. This would be a significant departure from the current regulatory paradigm, which emphasizes the market's inherent move towards equilibrium and associates virtually any innovation in financial markets as well as market expansion with efficiency. Such a new regulatory

¹⁶⁶ Note that in the following I use 'governance' and 'regulatory' regimes interchangeably. Both terms are meant to refer to the overall management of the financial system and include micro- as well as macro-prudential regulation. See also Tirole, *supra* note 14 at 323, who calls for a convergence of micro- and macroeconomics for purposes of analyzing and regulating financial markets.

paradigm would also require regulators to be more responsive to an ever-changing environment. It would require them to have the wherewithal to spot these changes and grant them sufficient flexibility to respond to new challenges as they arise. In short, it would require a highly competent, independent, and yet socially responsible super-regulator.

1. Responsiveness

IKE and MVF both emphasize the need for regulatory flexibility and discretion. In a world of imperfect knowledge neither market participants nor regulators know what the future will hold. It therefore makes little sense for lawmakers or regulators to devise highly specified rules to incentivize market actors so that they might achieve optimal outcomes. In that sense, both laws *and* regulations are incomplete.¹⁶⁷ Regulators may have somewhat greater flexibility in redesigning and adapting rules over time than do legislatures because regulatory change does not require the same broad political support as does legislation. Nonetheless, a regulatory philosophy that seeks to optimize rules *ex ante* will always lag behind market development.¹⁶⁸ Not only will it be ineffective should circumstances change; it also offers a convenient focal point for regulatory arbitrage. The more specific a regulatory regime, the more attractive it becomes for regulatory arbitrage and the less equipped it is to respond to such market behavior.¹⁶⁹

¹⁶⁷ See KATHARINA PISTOR & CHENGGANG XU, *Incomplete Law*, 35 *Journal of International Law and Politics* 931-1013 (2003), suggesting that regulators may be superior law enforcers than courts or legislatures under conditions of rapid technological or social change. Critically, however, in this paper the authors assume that the regulator knows which piece of information is relevant for markets. Under conditions of imperfect knowledge this may not be the case.

¹⁶⁸ See WILLIAM H. SIMON, *Optimization and its discontents in regulatory design: Bank regulation as an example*, 4 *Regulation & Governance* 3-21 (2010) for a critique of regulatory optimization models.

¹⁶⁹ See Pistor and Xu (2003), *supra* note 180, on the difference between specific rules and standards in terms of regulatory arbitrage.

Similarly, from the perspective of MVF it is difficult to determine *ex ante* where and when liquidity problems will occur in the future. In competitive financial markets entities are bound to search for or develop new asset classes that can be held or traded for profit. Illiquid assets can be made more liquid by attracting two-way dealers that offer liquidity risk management services, and new financial assets can be derived from others. This makes it difficult to foresee which asset class will be targeted in the future and which entities will serve as dealers or offer insurance services. Mehrling therefore argues that regulators should monitor “all” assets¹⁷⁰ -- a tall order given the pace and scope of innovation in today’s financial market place.

Taking Imperfect Knowledge and the Liquidity Constraint seriously implies the need to move from a regulatory framework that emphasizes rule optimization to one that focuses on processes for managing markets as they evolve, i.e. to monitor them, adapt existing strategies, and devise and implement new regulatory measures as need be to ensure that the market is stabilized before it reaches another pivot point.¹⁷¹ But who should exercise such power? Is it possible for a single actor to monitor all assets effectively? How much discretion should it have to intervene and what tools of regulation should be at its disposal?

Both theories place the central bank, in the US the Fed, at the center of attention. It occupies the core of the financial system¹⁷² because it is the only entity with unlimited access to high-powered money. According to Mehrling, the existence of a liquidity

¹⁷⁰ See supra note 172 and accompanying text.

¹⁷¹ See CHARLES SABEL, *Learning by Monitoring: The Institutions of Economic Development*, in Handbook of Economic Sociology (Neil J. Smelser & Richard Svedberg eds., 1995) for the concept of learning “by” monitoring as applied to the process of economic development.

¹⁷² This follows from the fact that the Fed has, in principle, unlimited resources to step in and offer market as well as funding liquidity at a time no one else does. See Mehrling (2011a), supra note 12 at 136-37, pointing out that the implications of the Fed’s role in offering market liquidity are as of yet little understood.

provider of last resort makes the money system inherently hierarchical. It seems only natural to endow the Fed with the regulatory tools to make the most of its position.¹⁷³ In IKE's account, the Fed also plays a critical role. It sets interest rates and engages in quantitative easing. And, although not specified as the agency that should adopt guidance range announcements, it would be a natural candidate for this role.

2. Who Governs the Governor(s)?

The empowerment of the central bank as the primary governance agent for financial markets raises fundamental questions of accountability and democratic governance. The Central Bank gets to decide in a looming crisis when and where to intervene, to select whom to lend to or what assets to accept as dealer of last resort. In essence, in extreme situations it decides over the life and death of individual entities and the system as a whole. That is a lot of discretion.¹⁷⁴ Even if experts on central banks assure us that central bankers are professionals and devoted to doing the right thing,¹⁷⁵ some accountability will be needed not only to guard against the temptation of abuse, but to ensure that there

¹⁷³ See PERRY MEHLING, *Three Principles for Market-based Credit Regulation*, American Economic Review (forthcoming) (2012) at 12, implying that the Fed is the natural regulator of financial markets in the US and under current circumstances even globally, and suggesting that the Fed has adapted to the changing market environment during the crisis.

¹⁷⁴ It is not suggested that Central Banks currently have no accountability. There are board structures at many central banks designed to ensure that outsiders monitor and advise the actions of the central bank, and in some systems there are regular hearings in parliament that force the chief officer at these institutions to explain their actions – but mostly ex post and without real teeth attached. For an introduction into central bank governance see ALEX CUKIERMAN, *Central Bank Strategy, Credibility, and Independence: Theory and Evidence* (MIT Press, 1992). For a reflection on central banks in the post crisis environment, see CLAUDIA E. V. BORIO, *Central banking post-crisis: What compass for uncharted waters?* 2011 BIS Working Paper (2011).

¹⁷⁵ This is essentially Mehrling's position notwithstanding his critique of actual Fed policies in the years leading up to the crisis. See, also, CHARLES K. WHITEHEAD, *What's your sign? International norms, signals and compliance*, 27 Michigan Journal of International Law 695-744 (2006) emphasizing the informal norms that bind these bankers of the world.

is some level of political responsibility if Central Bank actions fail to achieve the desired outcomes or have adverse effects.

One approach might be to require more public justification for Central Bank actions. IKE suggests that regulatory interventions, such as guidance range announcements, shall be reasoned and that the analysis that motivates the intervention is disclosed.¹⁷⁶ This is an important step in the right direction – provided the political system works effectively – but it may not be sufficient. The Central Bank will, of course, always justify its interventions by arguing that they were necessary to save “the system” from collapse. Putting aside concerns about bias or capture of such a powerful regulator, that justification sounds hollow: There will always be a range of options to choose from. The act of choosing when associated with the allocation of costs and benefits that these choices entail makes this in essence a political decision.¹⁷⁷ At least in democracies such decisions should be ultimately accountable to the electorate – unless in finance we face “the fateful choice between effectiveness and fidelity to the principle of self-rule”.¹⁷⁸ If only a central bank can save the financial system from collapse, one might argue, then perhaps it should be given all necessary powers to do so.¹⁷⁹ But this will not come without costs. The problem of delegating this much power to a central agent is compounded by the fact that traditional means for holding agencies accountable, such as

¹⁷⁶ See Frydman and Goldberg (2011), *supra* note 11 at 218.

¹⁷⁷ For an illuminating account of how the Fed has tried to disguise its policies as technical and dictated by “the market” in order to protect its own independence from political oversight, see Krippner *supra* note 137 at pp. 114 esp. 134/5.

¹⁷⁸ See CHARLES F. SABEL, *Beyond Principal-Agent Governance: Experimentalist Organizations, Learning and Accountability in De Staat Van de Democratie*. Democratie Voorbij De Staat (E. Engelen & MSD Ho eds., 2004) at [18]. Note that Sabel refers here to experimental governance in the event that it cannot be domesticated for democratic purposes, but the point is the same.

¹⁷⁹ See Mehrling’s Money View Blog, “Lords of Finance Redux – Forget the G7, Watch the C5”, 2 October 2011, available at <http://ineteconomics.org/blog/money-view/lords-finance-redux> (last visited 12 January 2012), suggesting that in the aftermath of the global financial crisis, the five major central banks, the US Fed, the Bank of England, the European Central Bank, the Bank of Japan and the Bank of Switzerland, are *the* governors of world financial affairs.

predetermining the objectives if not the means of regulation are unlikely to work. This approach presumes that the objectives of the regime can be determined *ex ante* and that, therefore, governing is primarily about implementing these objectives, not their articulation. Yet, in a rapidly changing world these objectives are unknown and the lines between goal determination and implementation are blurring.¹⁸⁰

Furthermore, some theorists have suggested that empowering a single agent at the core of the system may be counter-productive under conditions of uncertainty. Comparing the pros and cons of different forms of organization, Qian et al. suggest that the traditional hierarchical U-Form of firm organization works best when outcomes are known *ex ante*. If, however, outcomes are unknown, unpredictable, or if a firm seeks to discover new products or markets, the more flexible multi-functional M-Form is superior, as it encourages experimentation and cross-divisional learning.¹⁸¹ The equivalent of this approach in terms of regulatory architecture would be to have multiple regulatory agencies that coordinate horizontally with each other, not only through a central authority. This would give every regulator the requisite flexibility to respond to events as they emerge and facilitate communication and responsiveness of multiple agencies.

This is, of course, not the way most regulatory agencies are structured today. Most are independent from direct political interference and autonomous from one another, and they carefully guard their turf. In some countries they have been integrated into a single regulator, but that has re-enforced hierarchy not a coordinated, flexible response

¹⁸⁰ Sable *supra* note 175at 3.

¹⁸¹ YINGYI QIAN et al., *Coordination and Experimentation in M-Form and U-Form Organizations*, 114 *Journal of Political Economy* 366-402 (2006).

systems.¹⁸² The reforms that were introduced following the financial crisis also bear the hallmark of hierarchy, not horizontal coordination. The US still stands out in international comparison as a regulatory regime with many, perhaps too many, regulatory agencies. Still, the trend even here has been to centralize monitoring and regulation. Specifically, the Dodd-Frank Act¹⁸³ established the Financial Stability Oversight Council (FSOC), which comprises of the Fed, the Treasury and other key regulators.¹⁸⁴ The FSOC shall “identify risks to the financial stability of the United States”, “promote market discipline”, and “respond to emergency threats”.¹⁸⁵ It must rely on other regulatory agencies to perform this task, but the point is that all critical information shall be channeled through FSOC and that it has ultimate authority for determining when it is time to act and how.

This centralized approach is not inconsistent with IKE’s or MVF’s approaches to regulation. But these theories may well be underestimating the ability of a central agent to collect and process all relevant information. They also must find answers to the challenge coming from organizational theories that under conditions of uncertainty hierarchy may not be a suitable governance solution. This raises the question, whether there are viable alternatives, specifically solutions that encourage decentralized and discretionary law enforcement, yet are compatible with democratic oversight.

¹⁸² In many other countries there has been a remarkable consolidation of regulators. See James R. Barth, et al., *Bank Regulation and Supervision: What Works Best?*, 13 *Journal of Financial Intermediation* 205-248 (2004). Many reforms had been put in place already prior to the crisis without much discernable difference on crisis outcomes.

¹⁸³ H.R. 7143, 2 U.S.C. 906, available at <http://thomas.loc.gov/cgi-bin/query/z?c111:H.R.4173>: (last visited 18 September 2011) (hereinafter the Dodd Frank Act)

¹⁸⁴ See Sec. 111 Dodd Frank Act. There are a total of ten voting members of the FSOC in addition to five non-voting members. See *ibid* under (b)(1) and (b)(2).

¹⁸⁵ Sec. 112(a)(1) Dodd Frank Act.

A possible solution may come from the literature on “New” or “Experimental Governance”.¹⁸⁶ It holds that multi-level governance structures without a firm command center and clearly defined lines of control are feasible, in fact that they encourage stakeholder participation in the making and enforcement of governance regimes.¹⁸⁷ Critically, however, experimental governance presumes the willingness of all stakeholders to cooperate in the search for new governance solutions. This requires that they recognize that the objectives and means of governance are not known to any of them. It also assumes that stakeholders have a mutual interest in finding workable solutions, which is a prerequisite for their willingness to deliberate and experiment in the search for solutions.¹⁸⁸

Unfortunately, the world of finance is not a place where awareness of one’s own limitations or worldviews is very pronounced. Rather, it is characterized by groupthink and by intellectual silos that are reinforced by organizational practices.¹⁸⁹ Few market participants, officials at the Fed or the Treasury, or academics in the relevant fields saw

¹⁸⁶ See CHARLES SABEL & JONATHAN ZEITLIN, *Learning from Difference: The New Architecture of Experimentalist Governance in the European Union*, 14 *European Law Journal* 271-327 (2008) for a detailed account of experimental governance. It builds on the notion of “new governance”, but emphasizes the importance of experimentation and responsiveness in the face of uncertainties. On new governance see DAVID M. TRUBEK & LOUISE G. TRUBEK, *New Governance & Legal Regulation: Complementarity, Rivalry, and Transformation*, 13 *Columbia Journal of European Law* 1-26 (2007). See also JULIA BLACK, *Forms and paradoxes of principles-based regulation*, 3 *Capital Markets Law Journal* 425-458 (2008), who draws parallels between experimental governance and polycentric principles-based governance.

¹⁸⁷ See Dorf and Sabel (1998), *supra* note 195.

¹⁸⁸ Deliberation is core to experimental governance. See Sabel and Zeitlin (2008), *supra* note 182 at 296 for details.

¹⁸⁹ See GILIAN TETT, *Fool’s Gold: How the Bold Dream of a Small Tribe at J.P. Morgan Was Corrupted by Wall Street Greed and Unleashed a Catastrophe* (Free Press, 2009), describing firm outings to foster financial innovation that display features of social practices aimed at fostering community thinking and behavior; MICHAEL LEWIS, *The Big Short* (Norton & Co. 2010), suggesting that outsiders to the system were much better placed in spotting and making money on its flaws; BRAD M. BARBER & TERRANCE ODEAN, *Boys Will be Boys: Gender, Overconfidence, and Common Stock Investment*, 116 *Quarterly Journal of Economics* 261-292 (2001), suggesting that the dominance of males in stock exchanges affects investment strategies. See also Mehrling (2011a), *supra* note 12 at 57 on the impact of macroeconomic theories on Fed policies and MacKenzie, *supra* note 25 at 143 on the performative effect of financial models on markets and market participants – notwithstanding some rejection of these models at the outset.

the crisis coming;¹⁹⁰ those who did were derided for their deviation from the shared exuberance about a new dawn in the management of financial risk.¹⁹¹ Moreover, attempts to incorporate modes of experimental governance into financial regulation have failed spectacularly in the global crisis, at least in part because both regulators *and* the regulated were caught in the same belief system.¹⁹² Basel II, the revised Basel Accord to standardize financial regulation internationally, was lauded for incorporating such innovative practices in the regulation of banks.¹⁹³ It allowed banks to opt out of rigid capital requirements established by Basel I,¹⁹⁴ provided they could demonstrate to their regulators that they have in place effective internal risk management models and systems for their review. Famously, Northern Rock – the first English bank to experience a classic bank run since 1866 – received approval from the UK Financial Services Authority under Basel II to use its own internal risk assessment model only weeks before the bank collapsed.¹⁹⁵ As Simon suggests, the risk management models banks used and regulators approved

¹⁹⁰ Rajan correctly notes that it is wrong to say that nobody saw it coming, but he does suggest that only few did, among them Kenneth Rogoff, Nouriel Roubini, Robert Shiller, William White, and himself. See RAGHURAM G. RAJAN, *Fault Lines: How Hidden Fractures Still Threaten the World Economy* (Princeton University Press. 2010) at 1.

¹⁹¹ For the long history of repeat booms and busts in financial markets and the tendency to rationalize booms as indicators of a new dawn in financial development, see CARMEN REINHART & KENNETH S. ROGOFF, *This Time is Different: Eight Centuries of Financial Folly* (Princeton University Press. 2009).

¹⁹² This is perhaps best illustrated by Alan Greenspan's remarks during the crisis that he was "shocked" by the fact that markets are flawed. See Brian Knowlton and Michael Grynbaum, "Greenspan shocked that markets are flawed", *The New York Times*, 23 October 2008, available at www.nytimes.com (last visited 12 January 2012).

¹⁹³ See Simon, *supra* note 181 at 16, suggesting that at least in theory Basel II was meant to give credence to "continuous validation of risk management practices".

¹⁹⁴ For a critical assessment of Basel II see JON DANIELSSON et al., *An Academic Response to Basel II*, Special Paper LSE Financial Markets Group (2001). For a more positive account that hails Basel II as a first step towards managerialism rather than optimizing regulation in the financial sector, see Simon, *supra* note 181.

¹⁹⁵ A comprehensive analysis of the failure of Northern Rock, including management and regulatory failures, see HOUSE OF COMMONS, *The Run on the Rock* § HC 56-I (House of commons 2008).

were impaired by misunderstandings *shared by both banks and regulators*, including the assumptions that returns would be “normally” distributed and that reliable assessments of volatility could be based on data from short periods.¹⁹⁶

Add to this the fact that financial intermediaries can benefit from extending their own liquidity lifeline by developing new financial instruments and shifting assets to others at the expense of the stability of the overall system, it becomes obvious that cooperative experimentation may not be the right approach to regulating finance.

3. Too complex to govern?

If centralized financial governance by unaccountable agents is incompatible with principles of democratic self-governance; moreover, if hierarchy is unlikely to deliver on the promise of efficacy given the rapid evolution of finance and the fundamental uncertainty market actors and regulators face; and if, finally, innovative forms of governance under the heading of new or experimental governance do not offer a viable alternative, the logical conclusion is that financial markets have become ungovernable. Were financial markets self-regulating and capable of naturally achieving efficient outcomes, as EMH and related theories would have it, we need not worry. The empirical evidence of repeat and severe crises in financial markets, however, seems to corroborate Minsky’s insight that markets trend towards *instability* not stability. This would suggest that we need a different reform agenda. Instead of trying to govern the ungovernable we should instead focus on restructuring finance to ensure that it is compatible with our ability to govern and the normative principles we wish to be governed by.

¹⁹⁶ Simon, *supra* note 181 at 17. Emphasis added.

IV. Concluding Comments

The financial system is critical for market-based, capitalist economies. According to Keynes, it is *the* defining feature of these systems.¹⁹⁷ Yet, modern financial economics and its equivalents in legal academia – law and economics and law and finance – have little to say about how financial markets operate, how they are structured, why markets that were deemed efficient could collapse in short order, and what implications any of this might have for the governance of financial markets.¹⁹⁸ The black letter law that is taught in law schools is inevitably the codification of past views on finance and financial practices that may no longer be up to date at the time it is taught or practiced by recent law graduates.¹⁹⁹ The high level of technical sophistication needed to master these areas of law tends to obscure the dis-connect between law on the books, the theories that may have informed this law, and the actual operation of the financial system.

Lawyers do, however, play a critical role in the world of finance. They help structure new instruments, advise market participants on the legality of their actions and devise strategies for them to minimize the costs of regulatory restrictions. Lawyers also serve as expert witnesses to Congress and work in committees or at regulatory agencies that are charged with developing new legislation or regulations. This requires that lawyers know something about how markets operate in the real world. Fortunately, there are literatures that offer insights into this. The major objective of this essay has been to introduce these

¹⁹⁷ “The interposition of this veil of money between the real asset and the wealth owner is a specially marked characteristic of the modern world”. Keynes in “The Consequences to the Banks of the Collapse in Money Values” (1931), as quoted in Minsky (1986), *supra* note 10 at 130-31.

¹⁹⁸ One might think that lawyers have a comparative advantage over economists in understanding institutional structures, as this is their daily bread and butter. However, much of the economic analysis of law has been devoid of contextualized institutional insight. Instead, lawyers have increasingly relied on economic models to explain and to critique legal institutions.

¹⁹⁹ See the discussion of regulatory arbitrage *supra*.

literatures to a broader legal audience. It has drawn on older theories, such as Minsky's FIH and implicitly on Keynes,²⁰⁰ but also on more recent theoretical advances that build on them. The most critical factors in these alternative theories are Imperfect Knowledge and the Liquidity Constraint, and the interaction between the two. They help explain why markets tend to destabilize even under assumptions of actor rationality and ready access to relevant information. These theories therefore hold important clues for rethinking not only the governance of finance but the organization of the financial system itself. They remain underdeveloped with regards to their regulatory implications and arguably are over-optimistic about the feasibility of the few solutions they do advocate. This essay has highlighted some of these deficiencies and pointed to the logical conclusion these deficiencies imply: our inability to govern finance may be best addressed by changing the structure of financial markets, not to attempt the impossible.

The analysis presented here can and should be only the beginning of a more comprehensive debate about what kind of financial system we want to have. This essay hopes to make a modest contribution to such a debate; most importantly, it urges that it is too early to close the books on the crisis and critiques of the models that have failed to predict or explain it, and to proceed as if nothing has changed. It remains an open and pressing question whether the reforms that have been enacted offer any protection against similar events in the future. Of course, time will tell. Yet, we gamble on the ability of markets to generate equilibrium outcomes at our peril. As Minsky put it eloquently:

In an era when performance failures demonstrate the need for economic reform, any successful program of change must be rooted in an understanding of how economic processes function within the existing institutions. (...) A theory that

²⁰⁰ Minsky clarifies in the opening pages of his book that he is standing on the shoulders of giants, in particular Keynes. See Minsky (1986), *supra* note 10 at 5.

denies what is happening can happen (...) offers no useful guide to a solution of the problem.²⁰¹

²⁰¹ Minsky (1986), supra note 10 at 3 and 5.