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Do Accounting Rules Matter? The Dangerous Allure of Mark to Market

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Do Accounting Rules Matter? The Dangerous Allure of Mark to Market

Richard A. Epstein
*M. Todd Henderson**

Abstract

This paper examines the relative strength of two imperfect accounting rules: historical cost and mark to market. The manifest inaccuracy of historical cost is well known, and, paradoxically one source of its hidden strength. Because private parties know of its evident weaknesses they look elsewhere for information. In contrast, mark to market for hard-to-value assets has many hidden weaknesses. In this paper we show how it creates asset bubbles and exacerbate their negative collateral consequences once they burst. It does the former by allowing banks to adopt generous valuations in up-markets that increase their lending capacity. It does the latter by forcing the hand of counterparties to demand collateral even when watchful waiting and inaction is the more efficient course of action when the downward cascades generated by mark-to-market accounting may trigger massive sell-offs at prices below true asset value. The fears of private suits and regulatory sanctions on counterparties can compound the problem. Mark to market generates the functional equivalent of bank runs for which the functional equivalent of the automatic-stay rule in bankruptcy is the appropriate response.

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Do Accounting Rules Matter? The Dangerous Allure of Mark to Market

"There is no such uncertainty as a sure thing."

I. INTRODUCTION: HISTORICAL COST VERSUS MARK-TO-MARKET ACCOUNTING

There is nothing like profound financial dislocation to spur inquiry into the first principles of political economy. In some cases, that inquiry is over grand issues about the relationship of state to market. In other cases it is about seemingly smaller theoretical issues that loom very large in practice. This essay is about one such issue, the question of whether mark-to-market accounting is the proper technique to apply to hard-to-value assets. That question raises a tension between two techniques of valuation each with its own imperfections.

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The first technique uses historical cost as the benchmark for valuing certain assets. In essence the method starts with cost and then makes certain formal adjustments to estimate the value of an asset that has not been sold. For example, the normal rules for valuing a real estate improvement start with its cost. Thereafter, it reduces that basis by an allowance for depreciation, which is granted by regulation wholly without regard to the actual changes in value of the underlying asset.¹ In the end, a fully depreciated asset will be carried on the books as if it were worth zero, even if it still has positive value in use or salvage.

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A simple example illustrates the point. An asset that costs \$100 with an assigned 20-year life could have its basis adjusted downward under the "straight-line" method by \$5 each year, so that at the close of the second year it is carried at \$90. A tax deduction is given for a \$10 reduction in value, whether the market value of the asset is \$70 or \$110.² The difference between this "adjusted" basis of \$90 and the market value is taken into account as income (or loss) only on the disposition of the asset. Although in the interim one could fairly describe the asset as mispriced, the administrative costs of accurate annual pricing are judged as too high relative to the gains from more

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¹ See, e.g., IRS publication 946, available at <http://www.irs.gov/pub/irs-pdf/p946.pdf> (describing depreciation methods (including straight line) used under 26 U.S.C. 179).

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² See id.

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precise valuation.

As a matter of general theory, improvements in real estate will always depreciate so that on average, these adjustments tend to reduce the gaps between market value of the asset and its value on the books. Historical cost accounting for corporate shares do not have that downward directional bias, which reduces the reliability of the method. The market for shares is often thick so that there is no need to rely on historical cost accounting at all, as values can be continuously and accurately dated. Not surprisingly, therefore, the alternative to this system of historical cost requires the revaluation of unsold assets to market on a periodic basis. Accountants typically refer to this system as "fair value accounting." Tax lawyers and others prefer the equivalent term "mark to market." Mark-to-market accounting became popular after thrifts were accused of hiding "bad" assets by using historical-cost accounting in the years leading up to the S&L crisis in the 1980s.³ The business reality turns out to be more complex, for historical-cost accounting can only "hide" true values from people who don't want to discover them.⁴

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In this essay we shall explore the tensions between these two areas from an historical, economic, and legal perspectives to support the proposition that for all its manifest weaknesses, the hidden virtues of historical cost accounting could render it the sounder approach to accounting issues with hard-to-value assets. Part II reviews some of the historical events that led up to the mark-to-market system. Part III examines the theoretical vulnerabilities of the theory of mark-to-market accounting. Part IV deals with the importance of valuation issues, as it applies to both private and government actors, in setting the appropriate accounting rule. Part V addresses the many different approaches that can be taken toward this critical valuation problem. Part VI then seeks to assess the extent to which the choice of accounting rules matters in light of the previous analysis.

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II. THE S & L CRISIS AND THE RISE OF MARK-TO-MARKET ACCOUNTING

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The evolution of the S&L crisis during the 1980s played out as follows. Thrifts used deposits to fund long-term, fixed-rate mortgage loans. When interest rates are stable and thrifts do not need to compete aggressively on price for depositors, this business model is harmonious.

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³ See LAWRENCE J. WHITE, THE S&L DEBACLE: PUBLIC POLICY LESSONS FROM BANK AND THRIFT REGULATION 85 (1991) (hereinafter, WHITE, THE S&L DEBACLE).

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⁴ See supra notes 6-7, and surrounding text.

But, in the 1970s, inflation drove up interest rates, which induced new competitors, like money market funds, to enter the market. To attract depositors in this environment, thrifts had to pay higher rates on deposits. At this point the thrifts faced this deadly combination: long-term assets delivering low rates of return (since the contracts were made when rates were low) were now paired with the higher rates of interest needed to attract deposits to fund these assets. This asset-liability mismatch drove many thrifts into insolvency.⁵ But historical-cost accounting gave no *explicit* warning of the impending meltdown, because the losses from the change in interest rates were not reflected on thrift financial statements.

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As we discuss below, these tranquil balance sheets could have fooled no one, since everyone knew, or could easily calculate, the values, both real and as reported, of all assets and liabilities. Even though this asset-liability mismatch happened relatively quickly, everyone could see the day of reckoning approaching.⁶ For example, Lincoln Savings and Loan Association, of the Keating Five scandal, collapsed in 1989, but its problems were well known for many years before that. But the peculiarities of thrift regulation provided cover for the deterioration in assets by carrying them on the books for more than their actual value. That regulatory forbearance let Lincoln in 1987 and 1988 invest in nearly \$2 billion in Arizona real estate, most of which proved worthless. The bailout of Lincoln eventually cost the taxpayers over \$3 billion.⁷

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As this incident reveals, the historical-cost accounting system has two dominant features. The first is that it helps forestall regulatory action to take over or shut down a bank, thrift, or other financial institution. If regulators are duty-bound to put a bank into receivership once it is found critically undercapitalized or insolvent, positive financial statements supply valuable cover precisely because they do

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⁵ See, for example, MARTIN LOWY, HIGH ROLLERS: INSIDE THE SAVINGS AND LOAN DEBACLE 146-152 (1991) (hereinafter LOWY, HIGH ROLLERS); see also, WHITE, THE S&L DEBACLE, supra note 3 at 85. In part S&Ls had to pay prevailing rates to attract depositors because of competition from money market funds and the like whose higher rates lured traditional S&L depositors.

⁶ See, e.g., LOWY, HIGH ROLLERS, supra note 3 at 91 (citing criticism from pundits and academics); Paul Horvitz and R. Pettit, "Short-Run Financial Solutions for Troubled Thrift Institutions," in THE FUTURE OF THE THRIFT INDUSTRY, Conference Series No. 24, Federal Reserve Bank of Boston 56 (1981) ("The longer an institution losing money is allowed to continue in operation, the greater the ultimate cost to the insurance fund.").

⁷ See LOWY, HIGH ROLLERS, supra note 3 at 146-152.

not accurately reflect the bank's economic position. Accounting regulation becomes a powerful tool in the cause of regulatory discretion in cases where no discretion should be allowed.

The S&L crisis did not reach fever pitch because the markets believed thrift balance sheets. It came to a boil because of excessive forbearance by regulators. The root cause of this was political tampering. Thus in the Keating Five scandal, five senators⁸ intervened with regulators on behalf of their donor and friend, thrift owner, Charles Keating. The resulting delay of regulatory intervention took place under the prevailing accounting rule, which provided a patina of solvency when there was not even a glimmer of hope. The phenomenon can be generalized. Too often, government officials practice regulatory forbearance in response to political pressure from bank owners or out of a desire to avoid shutting down institutions that supply valuable services to well-connected constituents.

One important change put in place after the S&L crisis was a nondiscretionary system of regulatory intervention for undercapitalized banks, under the so-called prompt corrective action regime.⁹ The combination of mark-to-market and prompt corrective action was designed to take politics out of the government valuation process. Unfortunately, history has a way of repeating itself. During the housing bubble, Representatives and Senators resisted calls for more regulation of mortgage giants Fannie Mae and Freddie Mac because they helped make housing cheaper for low-income families. For instance, when problems with Fannie and Freddie surfaced for all to see, Senator Charles Schumer said: "I think Fannie and Freddie over the years have done an incredibly good job and are an intrinsic part of making America the best-housed people in the world . . . if you look over the last 20 or whatever years, they've done a very, very good job."¹⁰ This incident, and countless others like it, known and unknown, shows that regulatory tampering will exist regardless of the accounting rule.

The second feature of historical-cost accounting is that it gives a bank a longer window in which to conduct additional (risky) lending in order to bring the bank back from the brink of insolvency. This go-to-Vegas strategy is possible only if the bank's leverage ratio frees up

⁸ The were Alan Cranston (D-CA), Dennis DeConcini (D-AZ), John Glenn (D-OH), John McCain (R-AZ), and Donald W. Riegle, Jr. (D-MI).

⁹ Section 38 of the Federal Deposit Insurance Act, 12 USC § 1831o.

¹⁰ Sen. Charles Schumer, Sen. Banking Committee Hearing, Apr. 6, 2005.

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money to lend. That ratio in turn is determined by the difference between the stated value of assets and of liabilities. If under historical-cost accounting assets are reported at inflated values and liabilities are relatively fixed, there is greater capacity to lend. The new regime created a heads-I-win, tails-you-lose mentality.¹¹ Not surprisingly, failing thrifts took advantage of mispriced assets under the historical-cost accounting method to make additional risky loans that were in the interests of bank shareholders but not the taxpayers, who eventually had to bail out depositors of the failed thrifts.¹² The regulatory wiggle room provided by historical-cost accounting let the thrifts gamble with taxpayers' money.

These events did not go unnoticed. The Financial Accounting Standards Board,¹³ which operates under the aegis of the Securities and Exchange Commission, is the designated organization for establishing standards of financial accounting that nongovernmental entities use to prepare financial reports. In May 1993, in the wake of the S&L crisis, FASB promulgated new accounting rules that spurred the move toward mark-to-market accounting.¹⁴ The new rule required certain equity and debt securities to be reported at "fair value" instead of adjusted historical cost.¹⁵ This mark-to-market process requires that the firms attach values to assets held on the books in order to improve the "transparency" of the firm for the benefit of both government regulators and present and future trading partners.¹⁶ Over the next decade, the use of mark to market increased in response to market

¹¹ See, for example, MARTIN MAYE, THE GREATEST-EVER BANK ROBBERY: THE COLLAPSE OF THE SAVINGS AND LOAN INDUSTRY (1993) ("As S&L accounting was done, winners could be sold at a profit that the owners could take home as dividends, while the losers could be buried in the portfolio 'at historic cost,' the price that had been paid for them, even though they were now worth less, and sometimes much less.").

¹² See id.; see also LOWY, HIGH ROLLERS, at 146-152.

¹³ See Financial Reporting Release No. 1, Section 101, and reaffirmed in its April 2003 Policy Statement; see also the American Institute of Certified Public Accountants (Rule 203, Rules of Professional Conduct, as amended May 1973 and May 1979). From 2002 until present, FASB has operated under the authority of the Public Company Accounting Oversight Board (PCAOB), which is also under the SEC.

¹⁴ See FAS 107, "Disclosures about Fair Value of Financial Instruments, Dec. 1991.

¹⁵ See FAS 115.

¹⁶ See, e.g., Justin Fox, "Suspending market-to-market is for zombies," The Curious Capitalist Blog, Oct. 1, 2008, available at http://curiouscapitalist.blogs.time.com/2008/10/01/suspending_marktomarket_is_for/.

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demand for additional information about asset values.¹⁷ But, more importantly, the new regime worked hand-in-glove with leverage limit triggers under a federal legal regime that mandates government intervention as banks approach insolvency. The conventional accounting wisdom concluded that the FASB had invented a better mousetrap, sufficient to avert a replay of the accounting problems that helped create the previous S&L crisis.

Unfortunately, this bullish account ignores the downside of the story. Rules adopted in response to one crisis may not fit well with the challenges presented by the next; worse, new rules for old problems may help bring on new problems. For example, government regulation designed to solve the private monitoring problem took the form of "capital adequacy requirements," which through the so-called Basel accords, mandated banks hold a certain percentage of their capital in reserve to cover potential defaults on outstanding loans.¹⁸ Under the Basel rules, bank capital is not productive from the perspective of banks' shareholders, so banks can be expected to find ways to nevertheless deploy it. The banks did so primarily through exotic derivatives, like collateralized debt obligations (CDOs), which allowed them to originate loans (and take the fees associated with them), while shifting the risk off to special purpose vehicles, and thus freeing up their capital to make more loans (and fees). These CDOs relied on Baroque structures to diffuse claims to the point where no one was sure who bore what risk, whether that risk was excessive, and, if a problem arose, what to do about it.

A regulation designed to reduce excessive bank risk taking ended up increasing it, as well as the overall systemic risk in the market. This outcome is especially likely to occur where legal rules are designed to solve a problem unique to only one type of end user. This cautionary tale should guard us against the illusion that a smarter or more efficient regulator can nip large problems in the bud. The truth is often the opposite: the endless cycle of creating, enforcing, evading, and reregulating may dwarf the original problem. Each new round of imperfect rules, creates new opportunities for capture and arbitrage, which get only larger if key private parties can collect and interpret obscure information, both public and private, more rapidly than government regulators.

¹⁷ See, for example, <http://www.grantthornton.com/portal/site/gtcom/menuitem.91c078ed5c0ef4ca80cd8710033841ca/?vgnnextoid=62a78b6c6488d110VgnVCM1000003a8314acRCRD>.

¹⁸ Basel Committee: International convergence of capital measurement and capital standards, July 1988, available at <http://www.bis.org/publ/bcbasc111.htm>.

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This outcome is especially likely to occur where legal rules are designed to solve a problem unique to only one type of end user. More specifically, the risk of regulatory forbearance is always specific to government. We believe the mark-to-market rules designed to trigger government action perversely triggered too much private action in the rapid inflation and ultimate implosion of the housing bubble. We believe the simple change in accounting convention made the current financial crisis much worse than it otherwise would have been.

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Deleted: The fact that problem solving creates new problems is common. Government attempts to reduce moral hazard problems can also be expected to beget new problems, including novel forms of moral hazard. For example, government regulation designed to solve the private monitoring hazard problem took the form of "capital adequacy requirements," which through the so-called Basel accords, mandated banks hold a certain percentage of their capital in reserve to cover potential defaults on outstanding loans.

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III. THE FRAGILE THEORETICAL CASE FOR MARK-TO-MARKET ACCOUNTING

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One lesson that emerges from this historical account is that the risk of regulatory forbearance is always specific to government. This point influences the theoretical analysis that follows. More concretely, we believe the mark-to-market rules designed to trigger government action perversely triggered too much private action in the rapid inflation and ultimate implosion of the housing bubble. We believe the simple change in accounting convention made the current financial crisis much worse than it otherwise would have been.

In contrast, the prevailing wisdom is that whatever the costs of mark-to-market accounting, the benefits of transparency are worth it. It is for just this reason that the SEC in its recent report rejected recommendations to suspend the mark-to-market standard.²⁰ Many modern writers on the subject adopt this conclusion. For example, a recent World Bank report concludes that mark-to-market rules are needed to combat various forms of opportunistic behaviors:

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Especially at large and complex financial institutions, individual managers have strong incentives to discover and to exercise reporting options that overstate their capital and understate their exposure to loss. This expands their ability to extract implicit subsidies that risk-taking can generate from implicit safety-net support.²¹

The report supports this conclusion by noting, correctly, that the opacity of many balance sheets is accentuated by the use of special purpose vehicles that deftly keep certain key transactions off the books, thereby creating further opportunities for “arbitraging the

²⁰ U.S. Securities and Exchange Commission, Congressionally-Mandated Study Says Improve, Do Not Suspend, Fair Value Accounting Standards, December 30, 2008, <http://www.sec.gov/news/press/2008/2008-307.htm>. To be precise, fair value accounting represents a broad class of rules that reject historical cost-based accounting. Mark-to-market is one powerful rule in this group.

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²¹ Caprio, Gerard, Jr. & Demirguc-Kunt, Asli & Kane, Edward J., “The 2007 Meltdown in Structured Securitization: Searching for Lessons, Not Scapegoats,” Policy Research Working Paper Series 4756, The World Bank, at 22.

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regulatory system."²²

Notwithstanding these strong claims, we do not think that the matter admits to such an easy resolution. In our view, there is no clear-cut, first-best solution for the valuation of certain complex assets. In a world of imperfect information, the relevant inquiry is which of the two methods—historical cost or mark to market—produces on average the fewer errors. The answer to that question is context dependent. It is common ground that the mark-to-market rules do not work well with tangible depreciable assets, with their low turnover rates. It is also clear that these mark-to-market rules are fine for assets in thick markets—those with lots of buyers and sellers—that make tradable assets easy to value. At the current stage of empirical knowledge, however, the verdict is less clear for hard-to-value financial assets. If our view is correct, it reveals a great irony about the claim that mark to market serves as a bulwark against accounting manipulation: if the mark-to-market rules work best when informational asymmetries are low (i.e., market prices are more readily available), they don't do valuable work in those hard cases where they are really needed.

In our view, mark-to-market accounting (and its cousin, mark to model) may exacerbate bubbles when markets move upward and exacerbate downturns once those bubbles burst. Due to their magnitude, these swings leave in their wake dysfunctional lending markets and the dissolution of major investment banks. The valuation techniques are too imperfect to provide reliable information, so their application makes the entire system more fragile.

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FASB recognized this problem when it recently modified the mark-to-market rules to allow firms greater flexibility in reporting asset values where ill-functioning markets are unlikely to produce accurate prices.²³ Although we agree with the spirit of the FASB modification to FAS 157, we fear it does not go far enough. But whether right or wrong, it is important, we believe, to highlight a crucial theoretical criticism of mark-to-market rules thus far missing from the debate.

We believe that mark-to-market accounting prematurely forces counterparties to demand collateral, even when it would be efficient, both privately and socially, for the counterparty to refrain from such

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²² Id.

²³ See [FAS 157-D, available at http://www.fasb.org/fasb_staff_positions/prop_fsp_fas157-d.pdf.](http://www.fasb.org/fasb_staff_positions/prop_fsp_fas157-d.pdf)

demands. The constant application of the same misguided rule thus leads to self-perpetuating devaluation cascades, which, given the interconnectedness of modern financial markets, result in widespread destruction of real economic value. The difficulties are not mere happenstance. As we show below, the initial mark-to-market reform had two opposing consequences. It helped to discipline regulatory action. It also sparked risky practices by private parties. There are two key points.

The first is accounting rules in down markets must deal with a basic prisoner's dilemma in which counterparties must decide whether to demand additional collateral or to forbear because they predict a future increase in asset values. Using historical-cost accounting has this hidden virtue for private players. It preserves their option to forbear on demanding collateral, which in turn allows them to avoid the devaluation cascades that these collateral calls are virtually certain to create. Bankruptcy is a good analogy, where in the common situation the demand of a single unsecured creditor for security could trigger a rash of similar demands that can undermine or destroy the potential going-concern value of the firm. It is for that reason that the legal system developed the automatic stay to prevent the disintegration of the asset pool for the benefit of all creditors as a class. The mark-to-market rule works the opposite way, by forcing parties to demand collateral even where it might be efficient for them not to do so.

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We believe parties with the same information about current and future valuations might make different collateral decisions if historical-cost rules were still in effect. The mark-to-market rules force more private decisive action because shareholders and regulators stand behind their decision. The situation is fraught with danger because the counterparty to a contract for an asset is not a single individual capable of making an independent decision. Typically that counterparty is a legal entity that owes fiduciary duties to its shareholders or investors. Accordingly the threat of (ex-post biased) litigation from the counterparty's stakeholders can easily prevent firm managers from taking steps that are consistent with an efficient ex ante bargain that they would have made with these same stakeholders.

At the same time, there is no reason to think that regulators make better valuations, when they may also be subject to the same ex-post bias that plagues stakeholders in private ventures. The rational, or at least defensible, decision of the bank to value assets at more than market price could generate a legal penalty before bank managers have the opportunity to prove that their estimations are indeed better than the rest of the market. Once the bubble starts to burst, it is all too easy to condemn a bank decision that may well have been perfectly rational

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and efficient when made, solely because it appears opportunistic ex post. The fear of attracting regulatory wrath that could lead to stakeholder suits, either private or public, could make even the most informed firm reluctant to separate itself from the herd. Visibility begets liability, which in turn may prevent bank managers from practicing rational forbearance that makes sense for all the parties.

Regulators standing behind firms making collateral decisions also can exert a counterproductive influence. If banks are required by law to mark assets of declining value to market, regulators may be forced to intervene decisively on any short-term dip in asset values, even for asserts that may reasonably be expected to rise over the long run. The market value is only the summation of general views. The regulatory intervention necessarily removes those with positive expectations from the mix of players whose views can drive the market.

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The second key point is that the two different types of end users of accounting information—government regulators and private counterparties—may each have its own distinct optimal valuation rule. Mark to market was implemented not to solve a problem in private markets, but to remove regulatory discretion provided by historical-cost accounting. That rule, however, may have gone too far by eliminating efficient forbearance by market participants who, after all, were not fooled by historical-cost accounting the first time round. But government actors weren't fooled either.²⁴ As one paper on the history notes, "all of the major participants—the industry, Congress, the Executive branch, and the regulators—were aware of the relative depth of the crisis."²⁵ The problem for historical-cost rules was too much discretion for government regulators; the problem for mark-to-market rules was too little discretion for private actors.

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Given these conflicting pressures, we ask how can the legal system dial in the right amount of discretion for both regulators and market participants? It is far from clear that mark to market, even as amended, finds the right balance. In principle, we hope that private parties may learn enough to contract into legal regimes that require disclosure but not foreclosure. In light of our current knowledge, we are hesitant to predict what these optimal contracts might require going forward. Some recent empirical work by Charles Noussair and

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²⁴ See *supra*, note 6.

²⁵ R. Dan Brumbaugh, Jr. and Catherine J. Galley, "The Savings and Loan Crisis: Unresolved Policy Issues," reprinted in JAMES R. BARTH, ET AL., EDS., THE SAVINGS AND LOAN CRISIS: LESSONS FROM A REGULATORY FAILURE 89 (2004).

Charles Plott shows through experiments that the frequency of bubbles *decreases* as novel players learn the ropes.²⁶ Perhaps, the next time round the experience gained with mark-to-market accounting could ameliorate what we perceive to be its adverse effects. But for the moment at least, we fear that the incessant pressures from both tort law and regulatory bodies will block the needed contractual adjustments, as they have done in other areas. As we explain below, default rules matter, but that does not mean that all defaults are created equal. We believe that using a historical-cost starting position is superior to a mark-to-market one, because the former provides more contractual degrees of freedom than the latter. To see why, requires a more detailed analysis of the valuation process.

IV. The Importance of Valuation

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We thus turn to the debate about valuation. How should financial institutions (like all other firms) value their assets in a way that transmits the efficient level of accuracy and information? Everyone regards it as critical to know whether a given institution is or is not solvent at any given time. Mortgage lenders obviously care about this, as do trade creditors and employees. Solvent firms pay their bills; insolvent ones don't. Governments care too, since they represent taxpayers, who may be required to bail out failed financial firms. The government also could be thought to represent (and stand behind) potential tort creditors, who would otherwise bear the losses from being harmed by entities that cannot make them whole. The concerns of private and government entities are about much more than insolvency; a closer examination, which follows, is required to see why.

A. Private Valuation

Private parties are not worried only about insolvency. Market valuations are also required to decide whether a party that has purchased stocks, bonds, or other financial instruments on credit has to make good on a margin call. That judgment requires some assessment as to who best bears risk in the face of uncertainty about the future. When individuals and entities borrow to invest in securities markets, their leveraged bets can be quite risky. Requiring the borrower to make stop-gap payments to the lender in certain future states of the world softens this risk and reduces the moral hazard problems with levered

²⁶ See Charles Noussair and Charles Plott, "Bubbles and Crashes in Experimental Asset Markets: Common Knowledge Failure?", in CHARLES R. PLOTT AND VERNON L. SMITH, EDs., HANDBOOK OF EXPERIMENTAL ECONOMICS RESULTS, VOL. 1 (2008).

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bets.

To see how this operates, assume that an investor buys a stock for \$100, of which \$10 is his own cash, and \$90 is funds borrowed from a brokerage house. The brokerage house secures its loan by reserving the right to sell the shares, which it keeps in its possession, when the value of the stock threatens to slip below the amount of the unpaid \$90 loan. When the price goes up, the investor becomes more secure because the dollar value of his equity cushion increases. But if the value of the stock goes down, the broker will issue a “margin call,” which puts the borrower to the unhappy choice of adding more capital into the account or having the broker sell the stock in order to collect its underlying debt. At that point, the broker gets his \$90 first, plus interest and costs, before the investor gets the residual, if any. Conversely, if the security is not sufficient to cover the debt, the brokerage house is entitled, in principle at least, to collect a so-called deficiency judgment for the remainder. Leverage is double-edged sword—wonderful in good times but horrific in bad times. If the stock rises to \$150, the investor earns \$140, for a return of 1400%; if the stock falls to \$50, the investor loses \$50, for a return of -500%.

The problem is exacerbated in cases whenever other assets of the borrower available to pay the margin call also lose value as part of a general decline that could have sparked the margin call. If this investor has most of his assets in securities that have lost value because of a negative market trend, he can only come up with additional cash to fund the levered bet by selling other securities at fire-sale prices. Those sales may generate less money than they would have if the assets had been held for longer. Worse, the fresh round of sales may depress further the prices of all securities, including those held in margin accounts. A vicious cycle can easily develop, in which meeting one margin call precipitates the next margin call, and the next.

This same phenomenon—the dangers of leverage in a world of declining asset prices—operated writ large in the housing market leading up to the collapse of the housing bubble and subsequent financial crisis. Banks (and others) made bad bets on house values. These bets were made when leverage ratios on Wall Street rose from levels of 12 to 1 to over 30 to 1 in the past decade.²⁷ (To put this in

²⁷ See, for example, Julie Satow, “Ex-SEC Official Blames Agency for Blow-Up of Broker-Dealers,” *NY SUN*, Sept. 18, 2008, available at <http://www.nysun.com/business/ex-sec-official-blames-agency-for-blow-up/86130/> (“Using computerized models, the SEC, under its new Consolidated Supervised

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perspective, a firm levered this highly that saw its assets fall by just over 3 percent would find itself insolvent.) And, when the parties on the other side of these bets demanded cash collateral to meet what were effectively margin calls, the borrowers were forced to sell mortgaged assets into a market where there were few buyers and extremely low prices. These sales (or attempted sales) in turn put downward pressure on house prices. In other words, the initial drop in prices triggers distressed sales at further reduced prices, which lowers prices further, thereby generating additional collateral demands.

An active mortgage securitization market magnified the problem. Banks, as the original lenders on mortgages, were not the only parties who bet on specific mortgage assets. A large cast of third parties with no attachment or interest in these assets also made side bets on the original asset-specific transactions. This secondary market was many times larger than the primary market.²⁸ These known gambles were, however, both tolerated and encouraged because they provided liquidity for the original banks and information to the market for primary loans, which facilitated its expansion to marginal buyers who would have been otherwise without access to credit.

Unfortunately, leverage and risk amplification in the secondary markets have real problems. When house prices started to drop, counterparties to these side bets also demanded collateral, just like the stockbroker in the above example. Two potent conditions joined forces. First, all bets were correlated. Second, the size of this secondary market was unconstrained by any real-world assets and thus grew with great rapidity. In consequence, once the fall started, the amounts of collateral needed to offset the increased risk was orders of magnitude greater than the collateral needed to offset the losses in the primary markets. These secondary markets became in effect a black hole for collateral that sucked huge sums of monies from the Treasury. Government funds intended to generate new loans to stimulate economic growth had to be used to shore up fragile balance sheets caused by the collateral cascade that followed the decline in underlying asset prices. As we describe further below, mark-to-market accounting increased the instability of transactions by making short-term valuations the key driver of economic decision making. As we consider

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Entities program, allowed the broker dealers to increase their debt-to-net-capital ratios, sometimes, as in the case of Merrill Lynch, to as high as 40-to-1.”).

²⁸ See, for example, M. Todd Henderson, *Credit Derivatives are Not “Insurance,”* 16 Conn. Insurance L.J. 1, 11-15 (2009).

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below, if these short-term valuations reflect fundamental values, discounted to the present, there are no worries; if they are instead distorted by roiled markets, the mark-to-market rules can cause significant problems.

B. Government Valuation

These rules on valuation that govern private agreements also loom large for government regulation, especially of the banking industry. The optimal valuation rules for government regulators and private parties differ in critical ways. Although both private and public parties care ultimately about the economic state of a particular bank, political actors respond to valuation pressures that private parties may ignore. For instance, politicians who want to prop up failing banks to help bank insiders or certain borrowers tend to favor more permissive accounting rules. Thus the interests of the two relevant outsiders—private counterparties of the bank and government regulators—tend to diverge.

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In this environment, the rationale for banking regulation, which even small-government types support, runs as follows.²⁹ Banks can only make money if they lend the deposits they receive to borrowers at rates sufficient to cover the cost of capital, the risk of default, and the administrative expenses of running the entire operation. In order for banks to succeed, they must invest at least some portion of their deposits in long-term mortgages or other kinds of illiquid financial instruments—i.e., assets that cannot be converted immediately to cash. In ordinary times, a bank keeps enough cash and liquid assets on hand to meet the short-term variations in the demand for deposit withdrawals. Based on experience and sophisticated models, banks can invest nearly all of their cash on hand; saving a bare minimum to meet demand deposit requests is a way that lets banks maximize profits and increase the speed at which wealth is created by the economy. To reduce the risk of a mismatch between long and short positions, banks can enter into cooperative lending agreements that allow one bank to lend money to a second that faces for idiosyncratic reasons a sudden spike in the level of withdrawals. The Federal Reserve System is

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²⁹ One radical option that appeals to some small-government types calls for multiple private currencies. See, for example, DAVID GLASNER, FREE BANKING AND MONETARY REFORM (2005). That vision is unlikely to displace the well-entrenched central banking system run by the Federal Reserve, which has received dramatically expanded powers under the Dodd-Frank Act. See Wall Street Reform and Consumer Protection Act, available at http://financialservices.house.gov/FinancialSvcsDemMedia/file/key_issues/Financial_Regulatory_Reform/conference_report_FINAL.pdf.

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precisely this kind of cooperative lending apparatus among national and state-chartered banks.

Sometimes, however, the demand for withdrawal of deposits will not be random. Whenever common public events spur all depositors to demand their money at the same time, the bank is at risk of a “run” on its accounts, which, as viewers of “It’s a Wonderful Life” know, could wipe out a *solvent* bank that does not have the instantaneous ability to convert its illiquid assets to cash.³⁰ Interbank arrangements won’t help if all of the cooperating banks are subject to the same stress owing to external events. In these instances, the government acts as guarantor of last resort for the repayment of loans through the system of deposit insurance. The primary mechanism is guarantees of deposits up to \$250,000 by the Federal Deposit Insurance Corporation (FDIC), which charges member banks a small amount for this protection.³¹ The FDIC acts on the optimistic assumption that if depositors know that they have assurances from the only party with access to the money printing press, they have no need to pull out their money in times of stress.

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Yet this solution to the bank run creates a new problem in its wake. Let the depositors know their deposits are secure, and they will care little about the prudence of their bank’s lending operations. The government guarantee satisfies their worries about nonpayment, no matter how badly the bank performs.³² This difficulty raises the familiar moral hazard problem, and it inevitably leads to a less than optimal amount of private monitoring of bank risk taking. It therefore falls on the government, as it falls on every private guarantor, to take steps to monitor the bank so that it does not engage in risky activities that could trigger claims against it under the guarantee. Out of the government’s need to control moral hazard by its banks, the system of bank regulation has been born.

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Just as with private financial agreements, the questions of valuation become absolutely critical to government regulators. The FDIC wants to limit the riskiness of its member institutions in order to minimize the losses from failed banks. But it must contend with two

³⁰ <http://www.imdb.com/title/tt0038650/>.

³¹ See 12 U.S.C. § 1821(a).

³² There is a limit on deposits covered by insurance, which should result in some monitoring by larger depositors, but this limit can easily be evaded since larger depositors can divide up deposits into \$250,000 accounts at many banks and still be insured for each account, even at affiliated banks. See id.

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kinds of error. On the one side, it makes little sense to close down solvent banks that pay into the insurance system. On the other, it also makes little sense to allow insolvent banks to continue their losing operations, given their temptation to make double-or-nothing bets.

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Unfortunately, good bank regulation has to contend with powerful political forces influencing the relevant players. Bank insiders who learn of the insolvency before the federal examiners may strip bank assets by paying padded salaries, granting favorable loan terms to insiders, and paying out extraordinary dividends. These strategies are subject to legal restraints,³³ but these have proved insufficient to shield taxpayers for large losses when banks go under. Community activists often hope to keep banks alive so that they can receive loans for their local pet projects. Political actors can maneuver by receiving campaign contributions or even personal loans on favorable terms from banks that face risks of failure.³⁴ This collection of strange bedfellows exacts its pound of flesh. Recall that the S&L collapse, which festered because of meddling from all of these types, ultimately cost taxpayers over \$150 billion.³⁵

Mark to market was just one legislative reform introduced to solve the political incentives problem. After the S&L meltdown, Congress passed the "prompt corrective action" regime, which triggers automatic regulatory oversight and curtailment of activities of banks that fall below given leverage ratios. The regime mandates regulators act upon the occurrence of certain events, which gives them plausible cover when politicians come begging for regulatory restraint. The regime is designed to guard against both insider dealing and regulatory

³³ See, e.g., 12 U.S.C. § 375(b)(3) and 12 C.F.R. § 215.4(b) (limiting loans to any one insider to \$500,000 or 5% of the bank's capital), and the payment of dividends to some investors in certain instances, see 12 U.S.C. § 1831o (prohibiting payments on subordinated debt by critically undercapitalized institutions), these turn in part on the efficacy of regulation to intervene in a timely manner.

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³⁴ See [John R. Emswiler, "Fannie's 'VIP' Loans," WALL ST. J., July 21, 2010, available at http://online.wsj.com/article/SB20001424052748703724104575379353511744676.html.](http://online.wsj.com/article/SB20001424052748703724104575379353511744676.html)

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³⁵ See Timothy Curry and Lynn Shibut, *The Cost of the Savings and Loan Crisis: Truth and Consequences*, FDIC Banking Review, available at www.fdic.gov/bank/analytical/banking/2000dec/brv13n2_2.pdf ("As of December 31, 1999, the thrift crisis had cost taxpayers approximately \$124 billion and the thrift industry another \$29 billion, for an estimated total loss of approximately \$153 billion.").

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discretion in dealing with insolvent or near-insolvent banks.³⁶

Here is how it works: FDIC-insured banks must maintain at least a 4 percent ratio of capital to total assets in order to qualify as “adequately capitalized” and thus insulated from onerous government intervention. For instance, to meet the 4-percent test, a bank with \$96 in liabilities must maintain \$100 in assets. Undercapitalized banks (i.e., those not meeting the 4% threshold) must provide a sufficient plan for raising additional capital, reduce their activities to comply with limits on asset growth, and obtain prior government approval for activities outside of the ordinary course of business, such as opening new branches or new lines of business.³⁷ Recalcitrant banks also face the unwelcome risk of government takeover of the bank and the appointment of a receiver. That risk turns into a certainty of government takeover when a bank becomes “critically undercapitalized,” which is defined as a leverage ratio of less than 2 percent.

Efficient regulatory intervention thus marries prompt corrective action with mark-to-market accounting. But the scheme depends in large measure on the willingness of underincentivized government regulators to dig around in order to validate the reported value of assets held by banks and other entities. To be sure, the government could piggyback off of private valuations, but these valuations may be proprietary, and thus not readily available to regulators. Or, if available, they need not contain the information of direct relevance to public figures. The regime, regardless of the accounting rule, is always prey to the risk that insiders can all too easily manipulate valuations, which becomes ever greater as assets become harder to value. In this world, small changes in asset valuation can forestall large government interventions, given that liabilities are normally easier to value. When banks are close to the line, a one percent difference could spell the difference between bank autonomy and government oversight. Yet the critical measures, even when applied in good faith, are not sensitive enough to respond to these fine differences. For instance, commercial loans to small businesses do not trade in an active secondary market, so there is no “market price” for the value of these loans.

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These valuation matters are not idle theoretical possibilities. Recent experiences confirm the historical phenomenon that banks can fail rapidly and without sufficient warning to regulators to trigger

³⁶ Section 38 of the Federal Deposit Insurance Act, 12 USC § 1831o.

³⁷ Id.

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“prompt” corrective action. For example, the failure of Indy Mac bank happened in a few days and caught regulators relatively unprepared.³⁸ No legal regime is bullet proof against the determined machinations of bank insiders or political actors. The problem becomes ever more acute because no single rule of valuation covers all cases. This heterogeneity of valuation is our next topic.

V. THE MANY SENSES OF VALUATION

a. Threshold Issues

The choice of valuation rules, like mark-to-market or historical-cost accounting, need not lead to a one-size-fits-all solution. Variations across firms, industries, and business forms may exist at any one time. The variations within categories could matter over time. For example, valuation rules that work for banks might not work for utilities. Rules that work well for publicly traded firms might not work for closely held private ones. What works in good times might fail in bad ones. What works for regulatory purposes may be unsuitable for private valuations, and vice versa. More generally, valuation rules are subject to the same risk as any all-purpose tool, which will generally not function as effectively as a well-constructed tool kit.

Here is one example. Mark-to-market rules seem to perform badly when assets are long lived, illiquid, or senior in status, like the real estate mortgages held by many banks. In light of this heterogeneity, we might expect different rules to surface in different states, industries, or contexts. For instance, we could imagine state accounting codes and a choice for firms, akin to firm choice of state corporate law rules.³⁹ Such a competitive system would allow not only localized or temporal variation, but would also usher in a process whereby different accounting rules could be tested over time to help develop the most optimal ones.⁴⁰ Markets should be good judges of the

³⁸ See, Joe Adler, *FDIC Defends Handling of IndyMac Run*, AMERICAN BANKER, July 18, 2008 (quoting banking consultant Bert Ely: “They botched it. . . . the FDIC and the OTS were very slow to understand how bad the problems were at IndyMac. They still seem to have been unprepared to deal with the situation.”)

³⁹ See, for example, ROBERTA ROMANO, THE ADVANTAGE OF COMPETITIVE FEDERALISM FOR SECURITIES REGULATION (2003); Ralph K. Winter, *State Law, Shareholder Protection, and the Theory of the Corporation*, 6 J. LEGAL STUD. 251 (1977).

⁴⁰ One familiar example in corporate law allows firms a choice of the state law to govern their internal affairs. A similar regime could apply for accounting rules,

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efficacy of accounting rules, since counterparties want the best mechanism for reducing informational asymmetries between firm insiders and outsiders.

This portrait does, however, not capture how the world looks. First, a single set of accounting rules promulgated by FASB, known as Generally Accepted Accounting Principles (GAAP), applies to all firms in the US. Whether deploying a monopoly provider of accounting rules is efficient is a worthy subject for another essay. Ultimately the question may well be whether the standardization and centralization of rules outweighs the gains from competition across states and industries.

Second, different types of assets within any individual firm may be subject to different rules. It is this context that FASB (under the auspices of the SEC) has developed its own set of "fair value" rules. The fair value definitions of FAS 157 state: "Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date."⁴¹ Further development of this concept is needed, however, since FAS 157 raises as many questions as it answers.

Whenever quoted market prices are available, these prices can be used in so-called "Level 1" analysis. Where the exact security is not traded, but others like it are, "Level 2" analysis requires that extrapolations be made across relevant markets. Next, sometimes valuation involves "Level 3" assets, which, none too helpfully, the SEC notes "represents measurements that incorporate significant unobservable inputs that reflect the reporting entity's own assumptions regarding valuation parameters that market participants would use."⁴² These are called "mark-to-model" estimates: the firm holding the hard-to-value asset estimates its value based on internal models, and then reports those values.

Level-1 calculations present few, if any, problems. Mutual funds that invest all their assets in the publicly traded stocks and bonds of listed corporations routinely report exact values of their holdings on a daily basis. Thick markets with fungible assets create the "orderly"

with competing regimes offered by states, nations, or other regulatory entities. (Winter 1977, Romano 2003)

⁴¹ See, SEC Study on Mark-to-Market Accounting, at 23, available at www.sec.gov/news/studies/2008/marktomarket123008.pdf. For definitions, see FAS No. 157, ¶ 5.

⁴² FAS No. 157, ¶ 5.

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market needed for to make precise valuations. But all too often valuation veers off into both Level 2 and Level 3 territory. Even the line between these two categories, taken together, and Level 1 is less clear than many in industry think. In this large territory, claims about standardization and interbank comparisons are often suspect. As a report from the Federal Reserve Bank of St. Louis argued on the initial introduction of mark-to-market in the early 1990s:

[m]ethods of estimating market values for these nontraded assets and liabilities are likely to vary substantially across banks, making comparability a major problem. And because each market value estimate would have to be done on a case-by case basis, banks are likely to incur significant costs.⁴³

The more valuation is done in gray areas, the more generic rules of valuation may possibly lead to obfuscation rather than clarification. Note here the irony mentioned above: proponents of mark to market argue that it is needed to reduce insider opportunism, but where informational asymmetries between insiders and outsiders are biggest, the rule does very little real work.

The increased sophistication found in the design of modern assets—e.g., fancy financial derivatives, like CDOs—further compromises the clarity that attaches to traditional pools of financial assets. Modern financial wizards slice and dice stocks, bonds, and mortgages into ever-thinner elements, which are then recombined for resale to the general market as securitized products. A single home mortgage, for example, can be thought of as a collection of individual monthly payments for 30 years. The first-month payments from a like group of home mortgages can be bundled into one package and sold to buyers who want that income stream. The same can be done with every other horizontal tranche in payments. When the dust settles hundreds of investors beyond the original lender on the mortgage could end up with a stake in the payments of a single mortgage. Yet nothing prevents each from applying its own valuation to the riskiness of any acquired payment streams. Many of these investors rely on third parties, like rating agencies, to assess particular securities. Yet, as the evidence now makes clear, this elaborate process was, and is, highly

⁴³ See Michelle Clark Neely, "Making Sense of Mark to Market," The Regional Economist, Jan. 1994, available at: <http://www.stlouisfed.org/publications/re/articles/?id=1877>.

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flawed.⁴⁴ Indeed, this elementary example does not begin to capture the complexity of the financial bundles that human ingenuity can and will create no matter how sophisticated the governing regulatory regime.

Complicated or not, valuation remains a critical trigger under both private agreements and public banking regulations. To put this issue into the appropriate context, two large investment banks—Goldman Sachs and Lehman Brothers—had nearly 10 percent of their assets (or a combined \$100 billion) classified as Level 3 assets as of March 2008.⁴⁵ Only one of these firms is left standing today, and then only because of a massive intervention by the government.

b. Valuation Methods Revisited

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So how should valuation be done, both as a matter of principle, and within the SEC/FASB framework? For sake of simplicity, we can point to two different models of valuation that in principle converge on a common answer. As mentioned above, the first of these measures is the formerly-mandated “historical-cost accounting.” Under this method, an asset is valued on a company’s financial statements at its historical cost—what the firm paid for it—less adjustments like depreciation (set arbitrarily by regulation) or market price in the event of permanent impairment of the asset. As a matter of practical economics, this valuation method is plainly wrong and misleading. A computer purchased three years ago for \$2000 is obviously not worth \$2000 today; but this is the figure that a firm would report on its financial statements under historical-cost accounting.

So why has this method proved so tenacious? Most obviously, it has the underappreciated virtue of simplicity and low administrative costs. Less obviously, any sophisticated party, armed with good information, can correct any misleading reported number by reasonable due diligence. Indeed, ~~a~~ discussed below, historical-cost accounting ushers in a regime of caveat emptor that encourages private parties to make critical calculations, which could easily have salutary effects such as providing unbiased and heterogeneous information about values. In addition, as we show below, this process may help

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⁴⁴ See, for example, Jonathan Katz, Emanuel Salinas, and Constantinos Stephanou, *Credit Rating Agencies: No Easy Solutions*, World Bank Research Note 9 (Oct. 2009), available at rru.worldbank.org/documents/CrisisResponse/Note8.pdf.

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⁴⁵ See Yalman Onaran, “Goldman Sachs Level 3 Assets Jump, Exceeding Rivals,” *Bloomberg.com*, Apr. 9, 2008, available at <http://www.bloomberg.com/apps/news?pid=20601087&sid=a3N.I2aId51k&refer=home>.

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prevent bubbles from forming and prevent newly created bubbles from bursting in ways that cause systemic problems and dislocations.

The second accounting valuation method rests on the “fair market value” of the asset, or the price at which the asset will trade between a willing buyer and a willing seller when all of its attributes are known equally to both. Bystanders with no intention to trade don’t matter. A fair-value regime, moreover, does not necessarily presuppose that all active buyers and sellers reach the same judgment on valuations. Indeed, usually the opposite is true: trade flourishes because of differential evaluations because the future is unknown to both sides. Those who think that the asset is worth more will purchase assets from persons who do not. Similarly, even two parties that have the identical estimate of the median value of an asset will still trade if one party has a greater capacity to deal with uncertainty than the other. In both cases, exchange at the market price generates expected gains to both parties, which of course need not pan out at the end of the day. But “fair market value” in this context is not about assets that are actually traded. It only applies to tradable assets that are not in fact traded. Here the hypothesized exchange value gives rise to a number that commonly suffices for all regulatory and contractual purposes.

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That number, of course, can only be reached by making some assessment of the future cash flows that the asset will generate in different states of the world. In markets where transactions are random, the market value will in large measure rest on the best estimates of the future cash flows. It is on the strength of this basic insight that the mark-to-market principle is borne, for both public and private uses. If one is not sure whether an institution is solvent, or meets certain desired measures, transparency is aided by forcing it to mark all its assets to market in light of the available prices. If the numbers show that the assets thus computed exceed their liabilities, there is no reason to panic. Indeed, a bank whose assets have increased relative to their historical cost now has *more* liquidity, which entitles it to undertake more extensive lending activities under the system of fractional reserve banking mentioned above.

Conversely, fair-value estimation of both the mark-to-market and mark-to-model variety yields bad news if the portfolio has a current value below its historical cost, or below its previous (usually quarterly) valuation. Now the process works in reverse. The smaller capital base becomes a sure sign that the institution is overextended, because, for example, it has too many mortgages on its books. In these circumstances, one alternative is to raise new cash, which is likely to be difficult precisely because of the risky conditions. Accordingly, in

most instances, the firm will be forced to shrink the scope of its operations, and sell some of its risky assets in order to reduce the amount of riskiness in its portfolio. One central tenet of the Chicago school of efficient markets is that the price that the asset will fetch is independent of the reason for the sale. Thick markets, with lots of buyers and sellers, will treat the seller who wishes to rebalance his portfolio in exactly the fashion as the seller who must liquidate her position in order to pay for emergency surgery. On this view, both private and public auditing conventions that trigger sales keep financial institutions on an even keel by shining impartial light on their operations.

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Mark-to-market accounting updates the original cost figures by taking into account subsequent economic developments, which, in the abstract, make it the superior form of accounting for both private and public purposes. Indeed, if any party did not perform the mark-to-market valuation for itself, its potential trading partners are likely to think it valuable to gain that same information in some other fashion, so that they can make those calculations themselves. As the institution holding the asset has better information and has it all in one place, there are obvious efficiencies for asking the asset holder to do the mark-to-market calculations on which—if they are accurate—all other parties can rely. But again, there is no free lunch, for internally generated numbers are subjected to numerous biases and problems. Outsiders with a special interest in the financial position of a single institution thus could easily find it in their interest to rerun the numbers, either in whole or in part. Here is where the theory starts to break down.

An obvious source of the breakdown is the fact that manipulation of financial reporting is easy (think: Enron, Bernie Madoff, and so on), and the accuracy of numbers may be contestable, especially if the valuation systems don't work exactly as planned. One curious and oft overlooked irony about fair-value accounting is that it puts inordinate trust in those banking insiders that are likely to prove the least trustworthy. Weaning insiders from historical-cost accounting and putting them on mark-to-market accounting, is unlikely to prevent abuse. The insiders retain large discretion that allows them to manipulate the inputs into mark-to-model estimates in order to reach their desired valuation outcomes. In other words, mark to market works best where some outsiders have independent sources of information to corroborate the insider's conclusion, just like historical-cost accounting. When outsiders cannot independently check the disclosed mark-to-market values, fraud will breed. By contrast, mark to market has only modest benefits for well-regarded firms holding known assets.

Against the potential gains from mark to market—efficiency of aggregation and disclosure, transparency—we must offset the potential losses that may arise when mark-to-market rules contribute to market inefficiencies. The great dispute over mark to market arises where the markets are roiled, so that it is no longer sensible to make the Chicago school assumption that buyers and sellers are acting independently of each other, largely in response to changes in their private fortunes. Instead, the question is whether some common element undercuts the natural diversity of preferences, thus sending the market sharply off in one direction.

c. Valuation in Roiled Markets

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Bubbles are the most obvious manifestation of this tendency. They gain their vivid name for one simple but powerful reason. They fill with air (i.e., nothing of substance) until they pop. The inflation is rapid and, often, euphoric. The downward crash is anything but. Asset valuations are known to be erroneous, but only in retrospect, as with the South Sea Bubble, the Tulip Bubble, the equity bubble of the 1920s, the Internet Bubble, and, most recently, the Housing Bubble. Undoubtedly, many complicated factors contribute to the steep rise in asset values. Here we focus on only one: the role, if any, background accounting rules play in forming and bursting our recent bubbles.

We believe that mark-to-market rules contribute to the “irrational exuberance” of bubbles,⁴⁶ because lending tolerances for both firms and individuals are typically tied to asset values. As asset values rise, more cash is available, which can boost asset values by speculation and reinvested cash. For example, typically bank lending is limited by leverage limit rules. If liabilities are fixed, the greater the value of a bank’s assets, the more cash it can lend out to would-be borrowers or, importantly, distribute to bank shareholders or managers. The bank with \$96 in liabilities and \$110 in assets can invest close to \$10 before running into leverage-limits imposed by federal law. If these assets rise in value to \$150, the bank can invest or payout to shareholders the additional \$40, to please shareholders or line their own pockets. Bank managers thus have an incentive to increase the spread between the value of assets and liabilities, most commonly by inflating asset value.

On the plus side, the mark-to-market rule encourages and rewards investments in and management of well-performing assets. On

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⁴⁶ ROBERT J. SHILLER, *IRRATIONAL EXUBERANCE* (2006).

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the minus side, it encourages investments in dicey, but rising-in-value assets, thereby fueling even a known bubble. As Charles Prince, the head of Citigroup, stated about his firm's investments in the run up of the housing bubble: "When the music stops . . . things will get complicated. As long as the music is playing, you've got to get up and dance."⁴⁷ Firms whose asset values rise faster than rivals will be rewarded with higher stock prices, have greater investment opportunities, and collect more free cash to hire top managers and traders.[▲] Worse still, the managers can use the new cash to pay higher salaries to themselves or larger dividends to shareholders, thereby depleting firm assets still further. Where aggressive valuations turn fraudulent is hard to determine in thinly traded markets in which internal firm valuation models determine asset prices. These short-term gains for existing managers, shareholders, and employees could easily lead to long-term losses shouldered by taxpayers. No accounting rule can fully stop the dynamic, but we believe, mark to market can stoke the fire by allowing firms to trade on short-term rises in asset values.

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Nonbanks can follow identical strategies, which is what Enron did in the 1990s, when it lobbied its accounts and the government to permit it to mark to market its contracts for the future supply of energy and Internet services to market. That change in accounting convention let Enron treat its anticipated gains as though they had already been realized. In all likelihood, that new apparent source of wealth made it easier for managers to reap rewards, either innocently (perhaps, CEO Kenneth Lay) or fraudulently (e.g., Andrew Fastow).⁴⁸ This same story can be told about homeowners and many businesses during the housing bubble.

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⁴⁷ John Gapper, "Wall Street's Bruising Musical Chairs," FIN. TIMES, Nov. 14, 2007.

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⁴⁸ See C. William Thomas, "The Rise and Fall of Enron: When a company looks too good to be true, it usually is," *The Journal of Accountancy*, April 2002, available at <http://www.journalofaccountancy.com/Issues/2002/Apr/TheRiseAndFallOfEnron.htm>. Enron treated future values as if they were current values, thereby booking gains before they materialized in fact. When the full story unfolds, we expect that key some managers will be found to have reaped large rewards, either innocently (perhaps, CEO Kenneth Lay) or fraudulently (e.g., Andrew Fastow). This same story can be told about homeowners and many businesses during the housing bubble.

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⁵⁰ See, generally, Regulation S-K, Standard Instructions for Filing Forms under the Securities Act of 1933, Securities Exchange Act of 1934, and Energy Policy and Conservation Act of 1975, available at <http://www.law.uc.edu/CCL/regS-K/index.html>.

A more dramatic tale of woe can be told about the far steeper downward journey in asset values. Often financial publications treat the downward slide as a sharp continuous line, which presupposes that some trades take place at every point on the curve. Not so. Commonly, the downward side of markets is radically discontinuous. Those who bought on the upside cannot unload their assets at any interim fixing until the market settles in at a new and uncomfortable low. The Internet Bubble that burst in 2000 is one such illustration, but only in retrospect was it understood to be a bubble. At least that bubble was confined to a single sector of the market and, generally, one part of the country. But the more recent bubbles in real estate, oil, steel, wheat, and housing have combined to cause far greater dislocation. ***Ironically these bubbles may also produced lasting values. After all, many Internet-based firms of the late 1990s booked future fortunes to justify their meteoric rise. Although the firms went bust, the gains to society from large investments in new technologies was and remains very large.***

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The analysis, however, takes a different course, if asset values had remained tethered to historical cost, less cash would have been available to fuel the reinvestment that led to a steep rise in market values. But again there is no free lunch. This historical approach will falter whenever the increase in valuation rests on a sound economic appreciation of fundamental value (i.e., it is not a bubble). ***Yet here there is at most a delay in the realization of the new sources of wealth. In good times these assets can trade so that the new, and more reliable cost basis, replaces the old ones.***

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The same tension and uncertainty exists when values decline. Tied to historical cost, bubbles will stay inflated longer, which could be a bad thing, if the decrease in value is a product of short-term forces, or a good thing, if asset values were nothing but froth. So it is a question of whether we want swings that are too large or too small when no method is close to perfect. At this point the latter looks more desirable, even if delinking accounting rules from economic realities will in some instances unnecessarily retard growth. But the sober conclusion is that the error costs from both approaches are high, and the direction of the errors is often uncertain.

So in normal, well-functioning, and modest markets, mark to market may work reasonably well, whereas in bubbles, both in their formation and their demise, ***it is more likely that they will*** play a counterproductive role. In the next part we address the question of the best accounting rules to use given the uncertainty and complexity of valuation.

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VI. DO ACCOUNTING RULES MATTER?

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a. Theoretical Starting Points

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The initial puzzle is why any accounting rule ever matters. The rule itself only reflects how any financial entity reports its own position, not what others think or how they act. For example, if a firm paid \$100 for a security whose price drops to \$50, whether the firm reports \$100 or \$50 on its balance sheet, those who care about the *economic* value of the firm should dismiss the *accounting* treatment as irrelevant. After all, if the firm reports the stock was worth \$100 on the accountants' order, the market will go its own way and value the stock at \$50. An asset is worth what it is worth—the price it will fetch—regardless of what the accountants say it is worth. For Level-1 assets (i.e., those with readily ascertainable market values) mark to market is useful because it ~~relieves multiple outsiders of the need to redo the same valuation work.~~ There are, however, specialists in valuing individual firms and industries who can, and do, perform these calculations for a roster of clients, or even the public, at relatively low cost. These analysts, who are extremely well compensated, research and publish reports on valuation independent of the accounting conventions to detect mispriced assets, up or down, in which it is desirable to trade.

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Obviously, the more difficult it is to value any asset, the more challenging it will be for outsiders vis-à-vis insiders to adjust reported values to square with actual ones. For example, outsiders will be at a systematic disadvantage in valuing a firm's stock in a privately held firm because of their informational disadvantage relative to the insiders. Even in that case, however, the notes appended to a valuation report will, either by rule or in the interest of full disclosure, typically indicate the key assumptions behind valuation.⁵⁰ Industry or firm analysts may therefore correct reported numbers (whatever their convention) as they see fit, even for hard-to-value assets.⁵¹ The insider may have superior information, but the outsider has better incentives. The outsider, for example, has no incentive to raise profits in order to increase compensation bonuses. It is highly unlikely mark to market can achieve its stated objective of preventing fraud and abuse in cases of powerful informational asymmetries that give insiders relatively free rein. In short, where the rule is needed, it won't work, and where it will work, it isn't needed.

⁵¹ One of the authors, Henderson, performed precisely this type of work in a former professional capacity. The other, Epstein, has never filled in a spreadsheet.

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One illustration of the basic point of the peripheral role of accounting is the debate over whether share values should be reduced to take into account employee stock options that are currently out of the money. One approach dilutes current share earnings to take into account the prospect that new shares may issue. The other is to ignore those shares until they do issue. This should not be a big deal so long as anyone who reads a company's public report knows the accounting conventions and the status of the firm's various option programs. That information was routinely provided before the rules were changed to require expensing of stock options. Ironically, the new rules may provide less information than the old ones.

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The evidence supports this conclusion. Several papers have looked at the question of whether the market received new information as a result of a change in accounting convention on the expensing of stock options, and concluded that it did not.⁵³ It would be shocking if it did, for it would suggest sophisticated market players, who, after all, are the price setters in securities markets, were duped about the value of firm shares despite being given all the information about how to value them.

The same irrelevance principle should be true for accounting for any other sort of value under the same assumptions of informational parity, no collective action problems, and no litigation costs. But accounting rules seem to matter a great deal. Most obviously, these assumptions are not true in the real world, which is why accounting rules can matter. Even without these assumptions, however, it is hard to see why accounting rules matter much. After all, the business world operated using historical-cost rules for decades without being riddled with fraud and abuse. We think there are two ways in which accounting rules seem to matter a great deal. We turn to this issue

⁵³ See, for example, Larry Prather et al., Market reactions to announcements to expense options, 33 J. ECON. & FIN. 223 (2009) (examining firms that voluntarily changed to expensing between 2002-2004, and finding no systematic market response to the announcement); Sanjay Deshmukh, et al., Executive Stock Options: To Expense or Not?, 35 FIN. MANAGEMENT 87, 103 (2006) (finding no market reaction to expensing announcements from firms voluntarily making the change).

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B. Accounting Rules Matter

What is true in theory, however, may not hold when whether mark-to-market rules are set into real-world contexts. At this juncture we believe that accounting rules matter in both good times and in bad, and for different reasons depending on the end user of the rules. Let us consider each of these in turn.

1. They Matter for Regulation

The gist of the problem for regulators is that they operate under statutory and rule-based commands that use hard, accounting-based triggers. This was true in the period before the S&L crises and it is true today. For instance, the current statute governing FDIC control over member banks places banks in one of several tiers of firms based on the health of their balance sheets.⁵⁴ Section 1831o(c)(1)(A)(i) provides that capital adequacy review shall be based on a prescribed "leverage limit," which is set by subsection (c)(3)(B)(i) at "not less than 2 percent of total assets."⁵⁵ This 2-percent trigger is tied to "assets," but this term has meaning only in a particular accounting context. If the statute is interpreted in an historical-cost accounting world, technically assets are valued at cost less depreciation and other adjustments, not based on market value. This would give firms and regulators wiggle room in determining whether the statutory trigger has been satisfied. If, in a historical-cost world, regulators wanted to put in place the remedial measures of section 1831o based on market values falling below the 2-percent threshold, a bank would have strong grounds to resist the claim based on the statutory language. For example, a bank reporting assets with a book value of \$100 and liabilities of \$98 has a plausible claim of satisfying statutory leverage limits, even if the market value of the assets are less than \$98.

This is not an academic argument. It turns out that firms and regulators (pressured by politicians, captured by the regulated, or hopeful at saving "their" industry) followed the letter of the law, but not, perhaps, its spirit in holding back from forcing many insolvent thrifts into receivership in the 1980s.⁵⁶ One commentator describes the

⁵⁴ 12 USC § 1831o

⁵⁵ Id.

⁵⁶ As noted above, the story for regulatory forbearance was powerful.

According to one account, it went something like this:

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regulatory capture and political story as remarkable in the face of the overwhelming criticism from academics and pundits, who predicted the problem years before it ballooned into a billion-dollar fiasco. The disconnect was driven by the fact that “the academicians didn’t have to report to Congress and live with the industry.”⁵⁷

According to a leading historical account of the S&L crisis, “FDIC officials [admit] that they knew that some banks were really in trouble but the GAAP balance sheets indicated solvency.”⁵⁸ They claim the statutory triggers, when interpreted in light of then-prevailing accounting conventions, resulted in “needlessly hamstring[ing]” them,⁵⁹ and making regulatory action “substantially more difficult.”⁶⁰ This is a benign view of the problem. A more complete story of, as it turns out, excessive regulatory forbearance gets at several root causes:

Look, we’re good people. We have never caused any trouble. It is intolerable that a large fraction of our members should be perceived by the public to be in violation of the Bank Board’s net worth regulatory standards. We were not responsible for this high interest rate environment that has eroded our net worths, and, besides, we had no choice but to make thirty-year fixed-interest-rate loans. Give us time. Interest rates will surely decline, and the industry can surely heal itself.

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WHITE, THE S&L DEBACLE, *supra* note 3 at 85. This story, however, ignored the well-recognized incentives of thrifts under a liberal regulatory regime, the incentives such a regime would create for fraud (because of the moral hazard problem), and the fact that new entrants and forms of competition eroded the position of thrifts, even in lower-interest-rate environments. See *id.*

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⁵⁷ LOWY, HIGH ROLLERS, *supra* note 3 at 91.

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⁵⁸ Lawrence J. White, The Savings and Loan Debacle: A Perspective from the Early Twenty-First Century, reprinted in JAMES R. BARTH, ET AL., EDS., THE SAVINGS AND LOAN CRISIS: LESSONS FROM A REGULATORY FAILURE 26 n. 18 (2004).

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⁵⁹ *Id.* at 26-27 (“Maintaining the true solvency of depositories . . . is the ultimate goal of safety-and-soundness regulation. But measurement of solvency . . . is entirely an accounting concept. Unfortunately, the accounting system used for these purposes . . . focused on the historical . . . values of assets and liabilities rather than their current market values. . . . By using GAAP, with its historical cost bias, regulators needlessly hamstring themselves.”)

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⁶⁰ WHITE, THE S&L DEBACLE, *supra* note 3 at 43 (“The ability to take regulatory action when formal GAAP accounting indicates solvency for a thrift, even though other (market-based) measures indicate insolvency, becomes substantially more difficult.”).

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It is clear that the deposit insurers and regulators have been too slow to close insolvent institutions. Partly, the absence of market value information has masked true insolvencies from regulators. [T]he Congress and the regulators were instrumental in muddying to a further degree what was already an inadequate accounting system for thrifts. Also, political pleas for forbearance for favored depository institutions have been, and surely will continue to be, made. The consequence of these delays in closure have been additional costs in disposing of these insolvent institutions.⁶¹

All of these accounts share a common theme, which is that regulatory rules with literal meanings provide more regulatory discretion for forbearance in a world of historical-cost accounting. The FDIC report on the S&L crisis describes the role of accounting rules in the crisis as follows:

Unfortunately, . . . the liberal treatment of supervisory goodwill restricted the [regulator]’s ability to crack down on thinly capitalized or insolvent institutions, because enforcement actions were based on regulatory and not tangible capital.⁶²

The regulators themselves believed they were restricted by the accounting rules, and this, whether based on a good-faith reading of the statute or a convenient ad hoc justification, had real consequences on regulatory action. The end result was significant. According to one account, under regulatory accounting rules,⁶³ there were 71 insolvent thrifts with assets of \$15 billion in 1984; applying something closer to market values would have shown there were actually 242 insolvent thrifts with nearly \$250 billion in assets.⁶⁴

Yet it is not clear whether there was any alternative in light of

⁶¹ Id at 228-229.

⁶² Federal Deposit Loan Corporation, HISTORY OF THE EIGHTIES: LESSONS FOR THE FUTURE 174-175 (1991), available at <http://www.fdic.gov/bank/historical/history/>.

⁶³ These were known as Regulatory Accounting Principles (RAP), and were more permissive than GAAP in that they “allowed thrifts in some instances to report higher asset values . . . than standard . . . accounting rules allowed.” See LAWRENCE J. WHITE, THE S&L DEBACLE: PUBLIC POLICY LESSONS FROM BANK AND THRIFT REGULATION 83 (1991).

⁶⁴ WHITE, THE S&L DEBACLE, *supra* note 3 at 86, Table 5-9.

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political pressures, regulatory capture, regulatory hubris, and optimism about the future. Would regulatory action have been different in the S&L crisis if the accounting rules had been different? This counterfactual history is beyond our scope, but it is worth sketching a preliminary answer. We know that historical-cost rules allow regulators, however captured, to engage in foolishly optimistic actions. But these same pressures can also be brought to bear with mark-to-market rules. After all, even prompt corrective action rules leave regulators with discretion on how quickly to move with an investigation, with what remedial measures to put in place, how strictly to monitor compliance, and so forth. The decision not to intervene is also largely insulated from legal pressure, for it is highly unlikely that any private competitor would challenge the regulators for excessive forbearance, even assuming such a private right of action exists. In addition, the free-rider problems from bearing private costs to create industry-wide public goods are likely to prove insuperable. The only likely difference between the two accounting regimes is that banks have less ability to resist government *action* under mark to market, since one defense to such action—"under the statute we are solvent"—is not available. But neither rule imposes powerful restraints on regulatory oversight, as it is actually practiced.

2. They Matter for Private Valuation

Accounting rules also matter for private valuations, where they provide the floor or ceiling for adjusting private calculations. In this context, however, we believe that private discretion may in some cases help matters even if regulatory discretion does not. Our basic intuition is that markets do not behave well once we relax the twin assumptions of randomness and liquidity. The point has been demonstrated, subject to the usual restrictions of formal models, by Franklin Allen and Elena Carletti.⁶⁵ Written in 2006 (before the financial crisis) they conclude: "a shock in the insurance sector can cause the current value of banks' assets to be less than the current value of their liabilities so the banks are insolvent."⁶⁶ That risk matters less when assets are valued on the basis of historical cost, precisely because old information is not updated, for regulatory purposes, in response to the most recent

⁶⁵ Allen, Franklin and Elena Carletti, 2008. "Mark-to-Market Accounting and Liquidity Pricing," *Journal of Accounting and Economics*, 45: 358.

⁶⁶ The paper was first listed on SSRN in 2006. www.SSRN-id919900.pdf. In the SEC report it is quoted for how historic cost accounting "masked" the extent of the financial problems, SEC at 35. The advantages of historic cost accounting in preventing cascades was not discussed. Indeed the term cascade is not used in the SEC report.

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events. Therefore, shocks are somewhat blunted by an accounting rule designed to tie formal, regulatory value to an old and somewhat arbitrary number. It is, of course, possible for regulators to look past accounting conventions to actual value, but in practice the prompt-corrective-action rules are not triggered in these cases.

We believe that the basic logic works in parallel fashion on the up and the down side. Start with the creation of bubbles, which often begin with some uniform shift in the external market. In the current crisis, this might have been attributable to some combination of the relaxed loan standards with Fannie Mae and Freddie Mac,⁶⁷ and the spate of easy money.⁶⁸ Together these allowed assets (i.e., homes and their underlying mortgages) to be bid up above their true value. In effect, the buyers of the real estate impounded into the real estate price the implicit value of the subsidy. As the prices started to move upward, these tendencies were aggravated by the positive valuations from mark-to-market accounting. Matters were not made any easier given that many of the asset pools were thinly traded and hard to value. Once these assets peaked, the rapid decline in value was driven less by underlying asset values and more by the illiquidity of financial firms purchasing those assets.

The transition between the upward and downward pressures is hard to pinpoint or explain. Indeed, in many bubbles we think that sophisticated buyers enter the market with the expectation that the bubble will indeed burst, but only *after* they have sold their positions to new entrants into the market, often unsophisticated purchasers drawn into the market only after the price runs have been announced.⁶⁹ Eventually, the supply of new naïve investors is exhausted. At this juncture, the market starts to falter. When that happens, the mark-to-market rules now switch into reverse gear. The rapid decline in asset prices triggers massive asset sales made in order to meet various

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⁶⁷ See, for example, Peter J. Wallison and Edward J. Pinto, "A Government-Mandated Housing Bubble," *Forbes*, Feb. 16, 2009, available at http://www.forbes.com/2009/02/13/housing-bubble-subprime-opinions-contributors_0216_peter_wallison_edward_pinto.html (describing central role government-sponsored entities played in creating housing bubble).

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⁶⁸ See, for example, JOHN B. TAYLOR, *GETTING OFF TRACK: HOW GOVERNMENT ACTIONS AND INTERVENTIONS CAUSED, PROLONGED, AND WORSENE THE FINANCIAL CRISIS* (2009) (showing how federal funds rate deviated substantially from optimal level, and how this caused overinvestment in houses).

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⁶⁹ For an account of how this might work, see ANDREI SHLEIFER, *INEFFICIENT MARKETS* (2000).

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contract stipulations or regulatory requirements. For analytical purposes, it is best to ignore any difference between the statutory and contractual duties, because both types generate the very runs on the market that sensible banking and investment rules seek to avoid.

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Now reconstruct the thinking of potential buyers, all of whom know that that systematic, not individual, forces are driving the market downward. Hence put yourself in the position of potential bidder when the first, or weakest, of these financial institutions falls short on its liquid reserve requirements. One possible strategy is for the buyers to make estimates of the discounted cash flows. These could be quite reasonable, but asset complexity will likely induce caution, just as anyone who scanned the definition of the SEC's Level 3 valuations would predict. How does one mark an asset to market when the market itself has entered into dangerous territory that no one quite understands? In addition, liability fears may drive a rush to seize assets, force sales, or demand collateral. Shareholders standing behind firms making valuation decisions may put pressure on firm decision makers to act in ways that, although not value maximizing *ex ante*, are likely to minimize negative consequences in bad states of the world.

Liability fears may also keep other buyers out from the market, who fear that they could be sued for any economic losses when they buy assets in a down market. Even the automatic stay in bankruptcy may be ineffective here, since derivative contracts are excluded and many of the contracts responsible for the recent freezing of the credit markets are of this kind. These forces explain how mark-to-market rules generate additional pressures for low valuations.

Worse still, potential bidders are likely to conclude that these estimated values do *not* represent a stable resting point on which to calculate their optimal bids. Recall that shrewd traders don't worry about fundamental values in light of the influx of naïve buyers. They only ask when the supply of naïve buyers will run out. Similarly, in dangerous times, the fundamentalist approach to valuation represents a form of buyer myopia that professional players—the only ones left in the market—are not likely to suffer. They will understand that the reduced sales prices for the first set of assets to hit the market are highly likely to require the *next* bank in line to sell its assets in order to meet its heightened liquidity requirements under the combined weight of the mark-to-market and mark-to-model rules. Even worse, the cycle can easily repeat itself, so that cautious buyers will still hold off if they suspect that additional banks will be forced to sell, as asset prices continue to fall in thin markets. Exactly where the system strikes bottom in the absence of state intervention on the buy side is hard to say.

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We stress that the constant reevaluation of assets introduces a measure of instability that is not found with the historic cost valuation system. To be sure, under this system holders who are in possession of permanently devalued assets—what the accountants called “other-than-temporary impairment”—could be forced to write them down. But this exception leaves much more wiggle room to jawbone accountants and regulators, which reduced the odds of forcing that correction in a setting where asset holders could point to the short-term disparity between market and historical values. Historical valuation thus moves at a far slower rate in both directions. The transparency of fair value accounting thus comes at a high price. It is one of those unanswerable “empirical” questions of whether the inescapable biases of historical-cost accounting are more or less damaging than the less conspicuous but large biases from fair value accounting. We are confident neither system is error free.

If this analysis is correct, why do public and private bodies adopt this mark-to-market system given its destabilizing tendencies? One possible explanation is that the basic risk cannot be avoided. Thus assume that banks use historical-cost accounting systems, which all other sophisticated parties believe overstate the relevant asset valuations. Well at this point, the creditors and regulators (if not captured) will make the appropriate downward valuations by themselves. But it does not follow that the *intensity* of the down pressure will be the same in both settings. We think that the key difference resembles one found in criminal trials. Let the state *accuse* someone of wrongdoing, and some doubt remains. Let the criminal defendant *admit* the truth of the charges raised against him, and all doubt is resolved.

Carried over to the financial arena, any admission of capital shortages under mark-to-market rules will necessarily trigger other actors in the system to take all defensive measures required of them under various regulatory or contractual schemes. There are two distinct ways in which this is manifest.

First, write downs will force the hand of government regulators. As noted above, banks and other financial institutions regulated by the federal government are required to maintain adequate capitalization, as determined by, among other things, leverage limits. This means asset values (relative to liabilities) is crucial for counterparties, just as is for those they are dealing with on contractual terms. In other words, the write down of an asset by the bank holding it cascades to those counterparties standing on the other side of the transaction.

Consider two banks with a contract about a particular asset. Bank A, who holds the asset, marks the asset to market and reports a decrease in the value from \$10 to \$8. Bank B, who stands on the other side of the deal, must similarly report a \$2 decrease in the value of the asset in question, or demand \$2 in collateral from Bank A to make itself whole. If Bank B has \$100 in assets and \$96 in liabilities, it has the minimum 4-percent leverage limit, and therefore no tolerance for a decrease in the assets it holds. Under this circumstance, Bank B has no choice but to demand the \$2 in collateral, otherwise, it will see its asset value drop to \$98, and therefore it will move from “adequately capitalized” to “undercapitalized,” and therefore trigger regulatory intervention and costs. This is true even if Bank B believes in good faith and with certainty that the asset will rise in value to more than \$10 in the future.

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The same pressure to demand collateral would not exist (or exist to a much less extent) in a world of historical-cost accounting. Upon a downgrade in the value of the asset, Bank B could continue to report it as “worth” \$10, and therefore avoid the regulatory scrutiny that the downgrade would create. This is not necessarily a good thing, since Bank B might not be acting in good faith or with considered judgment about the future value of the asset. Sorting efficient forbearance from opportunistic forbearance will be difficult in the private sphere, just as it is in the public one. The point here is simply that the accounting rules exert this pressure, even in cases in which it does not make economic sense for anyone involved.

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The second interested party standing behind (and pressuring) counterparties is their shareholders. Even if the counterparties, acting reasonably and in good faith, think it unwise to exercise their contractual rights, the public revelation of values may give them no choice if their business superiors sense legal exposures. Eager plaintiffs and their lawyers wait in the wings, ready to invoke publicly available valuations to attack their decisions if the market continues to go down. Mark to market leaves no choice but to act even when it is economically wise to let the counterparty weather the storm. Visibility begets litigation not warranted on efficiency grounds. To be sure, a private party may invoke an insecurity clause under historical-cost accounting when asset values decline. But that choice would be its alone.

Now we are in a position to see the divergence between private and public costs. There could well be an efficient ex ante bargain— forbear from exerting legal rights to resist the downward spiral—that with hindsight may look like a breach of fiduciary or contractual duties ex post. If litigation costs and legal errors were zero, this

miscalculation would never occur. But both costs are high in cases like these, especially since courts will have a hard time distinguishing between sincere and opportunistic claims on the part of the forbearing bank. Anecdotally, this story of collapsing values based on collateral calls seems to have occurred on many occasions during the recent credit crunch in the wake of the collapse of the housing bubble.⁷⁰

Consider a stylized example. Bank A has a leveraged asset originally valued at \$100, but it is trading (in a suddenly illiquid market) for \$50. Bank B is a counterparty that has the contractual right to demand collateral of \$30 in the event that the value of the asset drops to this level. There is, however, great uncertainty about the future value of the asset. Bank B might reasonably believe that the asset will be worth more than \$100 in the future, in which case it will be better off than if it seized the asset and sold it in the current market. But there may be a chance that the asset will be worth less, in which case the additional collateral will reduce Bank B's losses. In this case, the sensible course for Bank B, regardless of the probabilities for its good-case and bad-case scenarios, would be to demand additional collateral.

This benevolent outcome only holds, however, when the collateral call and the future valuation are not correlated. If the decision to demand collateral somehow impacts the estimations of the future valuations, it might make sense for Bank B to forbear on its contractual right to demand new collateral. That conclusion may well hold in illiquid markets when the devaluation spiral discussed above, caused in part by mark-to-market accounting rules, kicks in. For instance, if Bank B believes that by demanding the collateral from Bank A, it will force Bank A to sell additional assets of similar class on a fire-sale basis (say because of a decrease in the firm's debt rating), the market receives another downward result, and the cycle begins anew. Nothing in the netherworld of level 3 asset valuations can stand up to this kind of external pressure.

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The problem is that mark-to-market accounting exacerbates a classic prisoner's dilemma game and, on the margin, forces the game to a socially suboptimal Nash equilibrium. Consider the following two-by-two matrix of payoffs for two counterparties considering a course of action with respect to an asset held by a bank with whom they have a

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⁷⁰ See, e.g., Robert O'Harrow Jr. & Brady Dennis, "Downgrades and Downfall," WASH. POST A01, Dec. 31, 2008 (describing the death spiral of insurance giant AIG as facilitated by a series of collateral calls made by investment bank Goldman Sachs in which each collateral call caused a downgrade in AIG's debt rating, which in turn precipitated additional collateral calls).

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contract. Each counterparty can choose to demand collateral based on a marked-to-market price for the asset in question, or forbear from such a demand. (Payoffs are shown first for Counterparty I, and second for Counterparty II.) As shown on Figure 1, if both parties demand collateral, the value of the asset is 10, and each counterparty takes an equal share. If either counterparty demands collateral while the other does not, the party demanding the collateral will increase the value of its payoffs to 10, while the other party will get 0. The value of the asset remains at 10, because the demand of collateral by one counterparty causes the valuation cascade described above. But if both counterparties forbear from collateral demands, the bank is not required to sell the asset into roiled markets, and the payoffs from a long-term hold strategy increase asset value to 14. This joint forbearance allows both counterparties to increase their payoffs from 5 (in the case where both demand collateral) to 7.

Figure 1: The Mark to Market Prisoner's Dilemma

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		Counterparty II	
		Demand	Forbear
Counterparty I	Demand	5, 5	10, 0
	Forbear	0, 10	7, 7

The collectively (and socially) optimal strategy in this stylized example is for both parties to forbear from collateral calls. But acting separately, forbearance is not the dominant strategy for either party. By familiar reasoning that we will not rehearse here, the equilibrium position without coordination is at (5,5), while with coordination it rises to (7,7). Unless the costs of coordinating behavior are exceedingly low, some government intervention is needed. It is, therefore, not the form of the game that is decisive. It is the level of collective losses that arises in the forbearance process. Ordinary bankruptcy law secures mutual forbearance not for just two parties, but for any number of parties by using the automatic stay to force the creditors of the debtor

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to forbear individually in order to advance their collective interest.⁷¹ An increase in the number of active and sophisticated parties reduces the already slim possibility that the security creditors could enter into an agreement among themselves to secure that mutual forbearance, even as the overall stakes increase. Reputational sanctions will not be sufficient to cover the case.⁷² Nagging worries about antitrust liability for concerted action could muddy the waters further.

We have no doubt that these pressures are real no matter whether the firms operate under historical-cost or mark-to-market rules. Yet it hardly follows that we should be indifferent between these rules given that mark to market puts additional pressure on the game that reduce the likelihood of coordinated solutions. Recall that behind each counterparty lies interested parties who can pressure the counterparties to choose the locally optimal, dominant strategy of demanding collateral. Government regulators require firms to maintain adequate capitalization, as noted earlier, which can force financial institutions to write down asset values at the worst possible time under mark to market accounting. Historical-cost accounting is less subject to that pressure. The pressure on firms under mark to market is compounded by shareholder and tort liability. Anecdotally, this story of collapsing values based on collateral calls seems to have occurred on many occasions during the recent credit crunch in the wake of the collapse of the housing bubble.⁷³ It is simply easier to resist pressures to sell in a mark-to-market regime.

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The meltdown of the (in)famous hedge fund Long-Term Capital Management is instructive. In the Fall of 1998, a crisis in Russian government bonds trigger a “flight to quality,” which put LTCM’s significant bets on Russia in jeopardy.⁷⁴ These movements of capital in

⁷¹ See, e.g., THOMAS H. JACKSON, THE LOGIC AND LIMITS OF BANKRUPTCY LAW 10-15 (1986).

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⁷² Id at 19.

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⁷³ See, e.g., Robert O’Harrow Jr. & Brady Dennis, “Downgrades and Downfall,” WASH. POST A01, Dec. 31, 2008 (describing the death spiral of insurance giant AIG as facilitated by a series of collateral calls made by investment bank Goldman Sachs in which each collateral call caused a downgrade in AIG’s debt rating, which in turn precipitated additional collateral calls).

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⁷⁴ See, generally, ROGER LOWENSTEIN, WHEN GENIUS FAILED: THE RISE AND FALL OF LONG-TERM CAPITAL MANAGEMENT (2001); DONALD MACKENZIE, AN ENGINE, NOT A CAMERA: HOW FINANCIAL MODELS SHAPE MARKETS 218-242 (2006).

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turn put the massive fund on shaky ground.⁷⁵ Rumors began to circulate about LTCM collapsing,⁷⁶ which had disastrous consequences for the fund, in part because of mark-to-market accounting. Counterparties of LTCM were required to mark their positions with it to market. As market prices moved against LTCM, the fund was required to post large amounts of good-quality paper, e.g., T-bills, with its counterparties to reduce their risk. And, given the uncertainty about values and the thin trading markets, in which LTCM was the largest player, the “market” prices to which the parties marked assets were just guesses biased by the volatility of the situation. Fearing a LTCM bankruptcy, each individual counterparty had an incentive to establish the lowest possible market price for LTCM’s positions with it in order to gobble up as much collateral as it could.⁷⁷ There was an arbitration procedure for LTCM to dispute the marked prices. But arbitration takes time, and is conducted by dealers in these securities, who also feared that an LTCM collapse could impact market prices. These players were not outside the system but part of it, and equally helpless to change the rules of engagement under which LTCM collapsed. According to one history of the downfall:

The loss caused to a counterparty if LTCM became bankrupt could be mitigated by getting as much collateral as possible from LTCM before that happened, and this could be achieved by ‘marking against’ LTCM The outflows of capital resulting from unfavorable marks were particularly damaging in LTCM’s index-option positions, where they cost the fund around \$1 billion, nearly half of the September losses that pushed it to the

⁷⁵ In the Fall of 1997, LTCM’s 15 partners managed over \$125 billion in assets, based on about \$7 billion of invested capital, implying a leverage ratio of about 18:1. By the Fall of 1998, when LTCM collapsed, its trades on interest rate swaps numbered in the tens of thousands, and had a notional amount of more than \$1.25 trillion. See DONALD MACKENZIE, *AN ENGINE, NOT A CAMERA: HOW FINANCIAL MODELS SHAPE MARKETS* 218 (2006).

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⁷⁶ There was some misinformation about LTCM’s positions; after the crisis, LTCM received offers to buy about six times the amount of Danish mortgage-backed securities it actually owned. See DONALD MACKENZIE, *AN ENGINE, NOT A CAMERA: HOW FINANCIAL MODELS SHAPE MARKETS* 234 (2006).

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⁷⁷ One counterparty describe his fund’s motivations as follows: “When it became apparent that [LTCM] were having difficulties, we thought that if they are going to default, we’re going to be short a hell of a lot So we’d rather be short at 40 rather than 30, right? So it was clearly in our interest to mark at as [low a price] as possible. That’s why everybody pushed [the prices] against them, which contributed to their demise in the end.” NICHOLAS DUNBAR, *INVESTING MONEY: THE STORY OF LONG-TERM CAPITAL MANAGEMENT AND THE LEGENDS BEHIND IT* 213 (2000).

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brink of bankruptcy.⁷⁸

The analogy here to the collective action problem in bankruptcy is plain. Acting as individuals, every counterparty of LTCM had an incentive to demand as much collateral as possible; acting together as a group, the counterparties *might* have created more total value by forbearing from demanding collateral in order to let LTCM ride out the Russian storm. As it turns out, the best estimate suggests collective forbearance would have been the optimal strategy for the counterparties acting collectively—if LTCM had survived, its positions that were eroded by collateral calls would have been quite profitable. LTCM bet that treasury securities and more complex instruments commanding a premium over treasuries would eventually converge. They diverged dramatically during a brief time, which resulted in collateral calls from counterparties who were required to mark their assets to market. “In the end, the idea of LTCM’s directional bets was correct, in that the values of government bonds did eventually converge. Due to the high leverage, however, this only happened after the firm’s assets were wiped out.”⁷⁹

How then to prevent that the cycle from recurring? In practice, only one party is immune from this downward pressure. It is the United States, which can’t go insolvent given its general power of taxation. On this score, the original Bear-Stearns “bailout” program was instructive. Bear Stearns was cash-flow positive at the time that it was declared insolvent under the mark-to-market rules that forced its liquidation. Quite simply, it was taking in more cash than it was paying out. But what should be made of this fact? One scenario is that mark-to-market worked well precisely because it identified the weakness in the firm’s capital structure before all values were wiped out. We suspect, however, that the opposite is true in this instance. The mark-to-market rules function as Allen and Carletti predicted, namely to bring about the very run on the bank that the entire banking system was meant to deal with.

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One further qualification involves the possibility that these problems could have been avoided if the relevant parties, either public or private, had renegotiated the rules of the game to avoid the downward cascade. But renegotiation is costly in complex securitization markets on both the public and the private side. On the

⁷⁸ Id at 235.

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http://www.moneyscience.com/Information_Base/Long_Term_Capital_Management_%28LTCM%29.html.

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private side, the antitrust laws could easily dampen the cooperative efforts needed to sort out valuation requires cooperation by parties that operate in connection with each other. While networking situations sometimes give certain limited protections from the antitrust laws, every antitrust lawyer has the same cautious instincts. Don't let your clients talk to their peers lest someone accuse them of horizontal price fixing—until of course it is too late to do any good. On the public side, laws are laws, and often they do not allow government officials to waive the mandatory rules.

Similarly private securitization agreements, which govern the pooling of assets, present difficulties of their own. One problem is that these agreements often allow clients to withdraw at any time without showing cause. The ability to get out was often a key condition to get in. In stable markets, this system works fine, but these agreements are underpowered insofar as they are unable to stem the mass withdrawals that did take place when asset values started to crumble, forcing firms to liquidate assets under distress sale conditions. Perhaps the next round of agreements will contain provisions that force clients to stagger or postpone withdrawals in high stress situations. But just how these agreements would read, and whether they would be enforced, remains uncertain, casting a further pall on future investment practices.

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In addition, at the entity level further transaction costs obstacles intrude. Firms often like to pool assets in order to diversify risk. But the greater the diversification, the harder the renegotiation. No one person trades on his or her own account. Indeed, no firm investor can control the renegotiation, which contains rules that limit the power of syndicate leaders to vary terms without the permission of others. Getting that permission is never easy because there are always conflicts of interests among syndicate members so long as they do not all hold pro rata positions relative to each other. And whether or not they do hold parallel interests, it is not easy to deal with all the potential conflicts of interest that crop up in renegotiation, many of which have to be resolved within hours or minutes.

To see how this unfolds, note that the parties at the stage of an initial agreement could put stringent conditions on renegotiation, which are appropriate in situations where the risks of default are uncorrelated, but ill-suited for the setting where the high correlation among risks creates a real liquidity crisis. One simple example is this. The various tranches have different priorities, which indicate the order in which they are paid off. The moment a fixed value is attached to the portfolio, the low priority parties are wiped out. Without the settlement, they still have the chance that the asset value goes up.

More generally, settlement eliminates the existing variance, and thus favors high-priority parties over low-priority parties. Yet no one quite knows what to do. All the standard agreements underestimated the possibilities of systematic risk, which in turn made them less able to deal with it. Yet even when the problem is isolated, finding and enforcing the right rule is no easy matter. Coordination thus remains a problem, which the mark to market regime aggravates.

C. Default Rules Matter Too

Given the disarray the last time round, we predict that the next set of agreements will be both more subtle and complete. In principle, complete contingent-state contracts reduce the stress on default terms. But the complex forces that operate when the market faces a downward spiral occur by definition only in disequilibrium. Our concern is that the choice of the default accounting rule may have a big impact on the ability of parties to write efficient contracts. Specifically, our fear is that mark to market may create a background rule that inhibits the free contracting needed for parties to move to an efficient equilibrium.

In a world without mark to market, parties can privately contract for disclosures that would replicate a mark-to-market model. If the disclosure of the information from the firm holding the asset is valuable, the party valuing the firm can ask for it to be provided or simply do the work on their own. In a world with mark to market, however, it is more difficult for the parties to waive by contract any disclosures required by regulation. First, agency costs and moral hazard problems are increased by removing the transaction from judicial oversight. In addition, the effort may abort if courts refuse to honor these waivers, by treating them as a breach of nonwaivable fiduciary duties that the firm owes to the investors of the firm in times of falling asset values.⁸⁰ In addition, once a value is disclosed, the parties cannot easily contract to make it private again, when shareholders and regulators have instant access to the disclosed information. It is impossible to pretend to forget something that is known by those looking over your shoulder. For these reasons, we believe that the historical-cost default makes it easier for parties to contract into a new business arrangement. These rules provide more choice and flexibility than a default rule requiring disclosure, especially with large, well advised and represented parties who can make the needed risk assessments and efficiently bear any residual

⁸⁰ [For a more general discussion of default rules and fiduciary duties, see Douglas G. Baird and M. Todd Henderson, Other People's Money, 60 STAN. L. REV. 1309 \(2008\).](#)

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losses.

In particular, note this irony. Valuation at mark-to-market report may have the appearance of accuracy, which could inspire confidence when there should be none. Because historical-cost accounting is obviously wrong, it dispels illusions and thus creates an incentive for outsiders to conduct their own analysis of the value of assets. Where these are large and may have a big impact on the firm's prospects, multiple external valuations will be generated. These will in turn be baked into market estimates of the firm's value, thus providing the very aggregate, market-based valuation of the combined value of all assets that mark-to-market accounting hoped to achieve. But important granularity can still be achieved. Analysts and other outsiders also routinely break down a firm's overall valuation with separate valuations of individual assets or asset classes, which can be crafted narrowly or broadly to supply the market with the necessary clarity about the firm's individual components.

Such an outside-in process, as required by historical-cost accounting, is least costly when asset values are easy to figure, but provides its most important safety-check benefits when they are not. In those latter cases, a hoary doctrine of caveat emptor probably best reduces the risk of manipulation in any mark-to-market or mark-to-model system. Where fraud becomes likely because articulated values may be illusory, the legal system should discourage investor reliance and encourage their diligence.

D. What About the Government?

If we are correct that a historical-cost default rule may be more sensible for private actors, does that rule should work for government regulators? On one view, described above, the rule might not matter much. Regulators (and politicians) bent on forbearance, for good or ill, will find slack in the regulatory system, especially since decisions not to intervene, to go slowly, to interpret data, and to exercise expertise are hardly, if at all, reviewable. Mark to market may make regulatory inaction more costly on the margin, but the effect is likely to be small without the ability of those impacted by the decision, e.g., taxpayers or other firms, to exercise their voice cheaply and powerfully. Regulators may want to "follow the law" and "do the right thing," but again, these things may be in tension. What, after all, was the law regarding obviously insolvent thrifts? The historical-cost accounting principals were just cover for preferred actions, nothing more.

If this is right, we should come down on the side of historical-cost accounting as a default rule, since it will give private actors more

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freedom to write efficient disclosure contracts, it will not exacerbate the collective action problem about collateral demands, and it will not trigger as many bubbles or devaluation cascades.

Another possibility is to imagine two separate rules—one for regulators and one for the market. It would seem possible, if not costly, for banking regulation to require firms to report regulatory values or for regulators to conduct examinations in which they, like private analysts, do their own market-value calculations to determine the adequacy of bank capitalization. Statutes and rules could be adjusted in ways that would mirror the kinds of private agreements that parties would write against a default rule of historical-cost accounting. For instance, regulators could, anticipating the potential for efficient forbearance, require detailed plans for a faltering financial institution on why it should not get the regulatory axe. Something like this currently exists in the prompt corrective action rules described above, but these could be enhanced with more sophisticated accounting triggers built up from historical-cost baselines.

VII. CONCLUSION

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It is sobering to realize that so many of the issues that we have canvassed depend on classic empirical questions to which there are, if any, only approximate answers: did counterparties forbear in the way we suggested in the old regime? Has this changed with the adoption of mark-to-market accounting rules? Insofar as they can be answered, these issues are topics for another day. Anecdotal evidence supports our analysis, but more fundamentally, it rests on sound theoretical assessments of the complex interaction of public accounting rules and private valuation decisions, when everyone wishes they would not. In examining the financial wreckage, we can't lay all of the fault for the current crisis at the feet of mark to market. Bubbles preceded these rules and would follow their repeal or modification. But by the same token, mark to market made its own distinctive contribution to the likelihood and severity of the present crisis, which should not go unexamined and uncriticized.

This capital is not productive from the perspective of banks' shareholders, so banks can be expected to find ways to nevertheless deploy it. The banks did so primarily through exotic derivatives, like collateralized debt obligations (CDOs), which allowed them to originate loans (and take the fees associated with them), while shifting the risk off to others, and thus freeing up their capital to make more loans (and fees). These CDOs allowed even larger amounts of risk to be taken and, through Baroque structures, allowed risks to be diffused and attenuated to the point where no one was sure who bore what risk, whether the amount of risk being borne was excessive, and, if there were a problem, what to do about it. The regulation designed to reduce excessive bank risk taking ended up increasing it, as well as the overall systemic risk in the market. It is a familiar story: a problem begets a regulation, which begets attempts to avoid the regulation, which begets a new problem, which begets a new regulation, and so on. The argument at each regulatory stage, after failure, is that the problem can be solved by smarter or more efficient regulation. But, at the end, one is left wondering whether the game is worth the candle, since the endless cycle of creating, enforcing, evading, and reregulating may dwarf the costs of the original problem. Moreover, since imperfect individuals implement regulations, even perfectly designed regulations lead to capture and arbitrage, and therefore failure. The problem is worse, however, where value is more obscure and private information about value exceeds market or government information about the same.