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Fair Value Reporting Standards and Market Volatility

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One of the most important public policy debates in recent years has been the reform of accounting standards toward “fair value” accounting. Financial institutions, especially banks and insurance companies, have been at the forefront of this debate and have been the most vocal opponents of this reform. Judging from the intensity of the arguments and the controversy that this reform has generated, there is clearly much more at stake than what may appear to be esoteric measurement issues. We review the main strands of this debate, and describe a framework of analysis that can weigh up the arguments on both sides. Far from being an esoteric debate, issues of measurement have a far reaching influence on the behaviour of financial institutions, and determine to a large extent the efficiency of the price mechanism in guiding real decisions.

The immediate cause of the recent fierce debates has been the initiative of the International Accounting Standards Board (IASB) and the U. S. Fi-

Financial Accounting Standards Board (FASB) toward greater convergence of international accounting standards to one based more on the information that are provided by prevailing market prices - sometimes known as a “fair value” or “mark-to-market” reporting system (Hansen (2004)). This is in contrast to a measurement system based on historical cost which requires firms to record their assets and liabilities at their original prices with no adjustments for subsequent changes in the market values of those items.

The reform toward greater marking to market has had many influential champions. In testimony to U.S. House of representatives, Paul Volcker, chairman of the Board of Trustees of the International Accounting Standards Committee, has stated that one of the fundamental conceptual issues facing accounting regulators worldwide is the “extent to which standards should move away from traditional cost based accounting to marking assets and liabilities to market.....” (Volcker (2001)). Robert Herz, chairman of the Financial Accounting Standards Board has argued that “for accounting to better reflect true economic substance, fair value, rather than historical cost, would generally seem to be the better measure.” (Herz (2003)). Others have called the move to a fair value measurement system “the biggest shift in accounting and financial reporting since standard setting was set up” (Williams (2002)). Some in the popular press have gone further. One commentator writes

“Maybe, if companies in the United States and Asia had measured all financial instruments at fair value, regulators, depositors, and investors could have achieved greater regulatory and market discipline and avoided some of the losses that investors and taxpayers have had to pay during previous downturns in the economy” (Day (2000)).

However, arrayed against this formidable line-up has been an equally formidable group of banks and insurance companies drawn from the major industrialized countries, sometimes with the support of their prudential regulators. This group has waged an unprecedented joint lobbying campaign to limit the application of the FASB and IASB reform to their industries. For example, a joint international working group of banking associations (the banking associations of the United States, Australia, Canada, Japan, and the European Union) has issued a paper stating that “users of banks’ financial statements do not support a change to a full fair value accounting system because a full fair value system does not provide a sound basis for providing banking book net cash flows and lacks relevance” (JWGBA (1999)). Similarly, a recent survey released by the Geneva Association indicates that there is a broad consensus in the insurance profession for the view that “a full fair value reporting system would have an adverse impact on the risk transfer role that the insurance industry plays within the wider economic system” (Geneva Association (2004)).

Banks and insurance companies accept that marking to market is desirable for *some* items on the balance sheet -in particular for transactions entered into with the objective of making a profit from short term price variations. Their opposition is to a *full* fair value reporting system in which mark-to-market accounting should be applied uniformly to *all* assets and liabilities. In particular, they are strongly opposed to marking to market items such as long term loans and outstanding insurance claims that represent the major proportion of their balance sheets.

The arguments used by both sides raise a number of fundamental questions concerning allocative efficiency and the information conveyed by financial statements. Proponents of marking to market argue that the market

value of an asset is more relevant than historical cost because it reflects the amount at which that asset could be bought or sold in a current transaction between willing parties. Similarly, the market value of a liability is more relevant than historical cost because it reflects the amount at which that liability could be incurred or settled in a current transaction between willing parties. A measurement system that reflects the market values of assets and liabilities would therefore lead to better insights into the risk profile of firms currently in place so that investors could exercise better market discipline and corrective action on firm's decisions.

Such an argument would be overwhelming in the context of completely frictionless markets where market prices fully reflect the fundamental values of all assets and liabilities. The benchmark results from economics - the efficiency properties of competitive equilibria - could then be invoked, and no further argument would be necessary. However, when there are imperfections in the market, the superiority of a mark-to-market regime is no longer so immediate. The relevant analogy here is with the theory of the second best from welfare economics. When there is more than one imperfection in a competitive economy, removing just one of these imperfections need not be welfare-improving. It is possible that the removal of one of the imperfections magnifies the negative effects of the other imperfections to the detriment of overall welfare. Thus, simply moving to a mark-to-market regime without addressing the other imperfections in the financial system need not guarantee a welfare improvement. In some cases, the market price may not be the "true and fair" value of the asset.

Practitioners who have opposed marking to market have used three types of arguments. First, they argue that the very definition of market value by the FASB and the IASB assumes the existence of deep and liquid secondary

markets for their assets and liabilities. They note, however, that many the assets and liabilities of financial intermediaries do not trade in liquid secondary markets. Furthermore, much of the relevant information possessed by banks who originate a loan or insurers who underwrite a policy is “soft” and would never be priced in a market. Marking to market would thus decrease rather than increase the reliability of a bank’s financial statements (European Central Bank (2004)).

Second, mark-to-market accounting does not properly reflect the way in which banks and insurance companies manage their core businesses of granting long term loans and underwriting insurance policies. The essence of banking lies in taking long-term decisions about credit quality and concentration and fostering customer relationships over the life of the contracts. It is less concerned with short-term variations. Mark-to-market accounting could therefore have adverse real effects on banks and insurance companies’ core businesses by shortening their planning horizons (Geneva Association (2004), JWGBA, (1999)).

Finally, opponents of marking to market argue that reliance on market values for assets and liabilities runs the risk that the reporting standards will induce excessive volatility in the markets. The volatility is excessive in the sense that it is driven by short-term artificial fluctuations in financial market valuations in addition to the fundamental volatility driven by fluctuations in the riskiness of the financial institution’s long term cash flows. Marking to market, it is argued, will result in artificial volatility in income because for loans held to maturity, any deviations from cost will be gradually compensated for during the life of the loan, “pulling the value to par” at maturity (JWGBA (1999)).

It is important here to distinguish volatility of prices that merely reflect

the volatility of the underlying fundamentals from volatility that cannot be justified by these fundamentals. If the fundamentals themselves are volatile, then market prices will merely reflect the underlying reality. However, the “artificial” nature of the volatility refers to something more pernicious. Market prices play a double-edged role. Not only are they a reflection of the underlying fundamentals, but they also *affect* the market outcome through their influence on the actions of market participants. When the decision horizon of market participants are shortened due to agency problems or other market imperfections, then short term price fluctuations affect the interests of these market participants, and hence will influence their actions. There is then the possibility of a feedback loop where anticipation of short term price movements will induce market participants to act in such a way as to amplify these price movements. When such feedback effects are strong, then firms’ decisions are based on the second-guessing of others’ decisions rather than on the basis of perceived fundamentals. In this sense, there is the danger of the emergence of an additional, endogenous source of volatility that is purely a consequence of the accounting norm, rather than something that reflects the underlying fundamentals. Understanding the nature and severity of such effects is the key to appreciating the causes of the controversy surrounding the fair value reporting standards.

In spite of the intensity of the debate among practitioners, there has been surprisingly little academic research on the conceptual analysis of the trade-offs between mark-to-market versus historical cost measurement policies.¹ Our essay summarizes a recent paper of ours (Plantin, Sapra and Shin (2004))

¹O’Hara (1993) is an exception. Using an asymmetric information model, she investigates the effect of market value accounting on loan maturity and finds that mark-to-market results in a preference for short-term loans over long-term loans. However, the environment that she models and the forces in her environment are very different from ours.

that attempts to set out such a framework.

The fundamental trade-off can be described as follows. The historical cost regime relies on past prices, and so accounting values are insensitive to price signals. This leads to one type of inefficiency arising from excessive conservatism. By relying on past information, current decisions are distorted by being insufficiently sensitive to movements in the underlying fundamentals.

Marking to market overcomes this excessive conservatism by relying on current market prices, but it does so at the cost of *distorting* this information. When the decision horizons of managers and market participants are shortened due to various agency problems, the anticipation of future prices affects firms' decisions now which, in turn, injects artificial volatility to prices. Knowing all this, the managers and market participants become even more sensitive to short term price movements and are pushed to act in ways that amplify these short term price movements. Even when the underlying fundamentals are relatively stable, the mutually reinforcing effect of agents' actions can produce substantial fluctuations in prices that bear little resemblance to the fundamentals.

An extreme form of such artificial volatility is the phenomenon of "liquidity black holes". Occasionally, financial markets experience episodes of turbulence of such an extreme kind that they appear to stop functioning. Such episodes are marked by a heavily one-sided order flow, rapid price changes, and financial distress on the part of many of the traders. The 1987 stock market crash is perhaps the most glaring example of such an episode, but there are other, more recent examples such as the collapse of the dollar against the yen on October 7th, 1998, and instances of distressed trading in some fixed income markets during the LTCM crisis in the summer of 1998. Practitioners dub such episodes "liquidity holes" or, more dramatically, "liq-

uidity black holes” (Taleb (1997, pp. 68-9), Persaud (2001)).

Liquidity black holes are not simply instances of large price changes. Public announcements of important macroeconomic statistics, such as the U.S. employment report or GDP growth estimates, are sometimes marked by large, discrete price changes at the time of announcement. However, such price changes are arguably the signs of a smoothly functioning market that is able to incorporate new information quickly. The market typically finds composure quite rapidly after such discrete price changes, as shown by Fleming and Remolona (1999) for the US Treasury securities market.

In contrast, liquidity black holes have the feature that they seem to gather momentum from the endogenous responses of the market participants themselves. Rather like a tropical storm, they appear to gather more energy as they develop. Part of the explanation for the endogenous feedback mechanism lies in the idea that the incentives facing traders undergo changes when prices change. Market distress can feed on itself. When asset prices fall, some traders may get close to their loss limits and are induced to sell. But this selling pressure sets off further downward pressure on asset prices, which induces a further round of selling, and so on. Portfolio insurance based on dynamic hedging rules is perhaps the best-known example of such feedback, but similar forces will operate whenever traders face constraints on their behaviour that shorten their decision horizons. Daily loss limits and other controls on traders’ discretion arise as a response to agency problems within a financial institution, and are there for good reason. However, they have the effect of shortening the decision horizons of the traders.

The feedback effect (in which selling pressure sets off further downward pressure on asset prices) is made possible by the marking of positions to market prices. The prices not only convey information about the world,

they are also an *imperative to action* by the traders themselves. Thus, there is not only a direction of causality from actions to prices, but there is also a direction of causality from prices to actions. This completes the circle that starts from prices to actions, back to prices. Liquidity black holes are but the extreme case of this feedback effect. The general mechanism is more general, and operates pervasively.

For hedge funds and other financial institutions that deal mainly with marketable financial assets, marking to market is the norm. The worry about the new international reporting standards is that the hair-trigger behaviour of such institutions may spread to more traditional banking and insurance sectors by importing the potential for amplified responses to market turbulence.

The theoretical analysis in Plantin, Sapra and Shin (2004) suggests that potential harm done by reporting standards that enforce marking to market depend on the following features.

1. The longer the duration of an asset, the more vulnerable it is to artificial volatility. In particular, for sufficiently long-lived assets, a historical cost regime is superior to a mark-to-market regime. Conversely, for shorter-lived assets, a mark-to-market regime dominates a historical cost regime.
2. The more illiquid is the market for the asset, the more vulnerable it is to artificial volatility. For those assets whose markets have a limited absorption capacity for sales, a historical cost regime is superior to a mark-to-market regime. Conversely, for those assets with sufficiently deep and liquid markets, mark-to-market is preferable.
3. Senior claims that have limited upside but a large downside risk are the

most susceptible to artificial volatility in the mark-to-market regime. Junior claims with a large potential upside but limited downside are more plagued by the conservatism of the historical cost regime.

These findings shed some light on why the opposition to marking to market has been led by the banking and insurance industries. For these financial institutions a large proportion of their balance sheets consists precisely of items that are long duration, illiquid and senior. For banks, these items appear on the asset side of their balance sheets. Loans, typically, are senior, long-term and very illiquid. For insurance companies, the focus is on the liabilities side of their balance sheet. Insurance liabilities are long-term, illiquid and have limited upside from the point of view of the insurance company.

The modelling approach adopted in Plantin, Sapra and Shin (2004) is to keep the details to a bare minimum, but with just enough richness to capture these effects. The study models the behaviour of financial institutions that have acquired an asset in a primary market and face the decision whether to hold it until maturity or off-load it in a secondary market, such as the securitization market or the reinsurance market. There are three ingredients that make such a decision problematic. First, the horizon of firms does not match the duration of their assets. Second, the true value of the asset cannot be contracted upon. Instead, the value of the firm can be measured only with the prices of its assets, either the past price (historical cost regime) or the current price (mark-to-market regime). Third, the secondary market for the asset is illiquid - there is limited absorption capacity for sales. The limited capacity of the market to absorb sales of assets has figured prominently in the literature on banking and financial crises (see for example Allen and Gale (2001) and Gorton and Huang (2003)). Finally, the buyers in the secondary market are not able to extract the same full value as the originators - the

specific skills of banks is an important ingredient, as in Diamond and Rajan (2000).

Under the historical cost regime, short-horizon firms find it optimal to sell assets that have recently appreciated in value, since booking them at historical cost understates their worth. Despite a discount in the secondary market, the inertia in accounting values gives these short horizon firms the incentives to sell. Thus, the historical cost regime leads to excess conservatism—firms have no incentives to exert their skills when it is the most valuable.

A natural remedy to this problem would be to shift to a mark-to-market regime. This is only an imperfect remedy, however. The illiquidity of the secondary market causes another type of inefficiency. A bad outcome for the asset will depress fundamental values somewhat, but the more pernicious effect comes from the negative externalities generated by other firms selling. When others sell, short term prices are depressed more than is justified by the fundamentals, and exerts a negative effect on all others, but especially on those who have chosen to hold on to the asset. Anticipating this negative outcome, short-horizon firms will be tempted to preempt the fall in price by selling the asset itself. However, such preemptive action will merely serve to amplify the price fall. In this way, the mark-to-market regime generates endogenous volatility of prices that impede the resource allocation role of prices. Using techniques that borrow from the recently developed theory of “global games”, it is possible to characterize such artificial volatility as a function of the underlying fundamentals.

In general, marking to market tends to amplify the movements in asset prices relative to their fundamental values in bad states of the world. The mark-to-market regime leads to inefficient sales in bad times, but the historical cost regime turns out to be particularly inefficient in good times. This

is why the seniority of the asset's payoff (which determines the concavity of the payoff function) and the skewness of the distribution of the future cash flows have an important impact on the choice of the optimal regime.

As the duration of assets increase, both regimes become more inefficient. However, the historical cost regime exhibits less inefficiency relative to the mark-to-market regime. This is because the negative externality exerted by other sellers becomes more severe when the duration of the asset increases, and the firms' actions are influenced more by the second-guessing of other firms' decisions.

This analysis highlights some key factors in the strategic interactions between firms in the secondary market. Under the historical cost regime, actions of the firms are *strategic substitutes*. Sales by the other firms drive the market price down, which makes holding the asset booked at the acquisition cost more desirable. Conversely, in the mark-to-market regime, firms' actions are *strategic complements*. The expectation of sales by the other firms makes holding the asset *less* desirable because of an expected low market value at the reporting date. Strategic substitutability has a stabilizing effect, so that the market price is "artificially smooth" as compared to the true value of the asset under the historical cost measurement regime. Strategic complementarity adds endogenous volatility, so that the market prices are "artificially volatile" as compared to the fundamental values in a marked-to-market economy.

These strategic effects give a pivotal role to the liquidity of the secondary market. In more illiquid markets, strategic concerns become more important. As the market becomes more illiquid, strategic complementarity increases in the mark-to-market regime, leading to greater incidence of sales and more volatile prices. In the historical cost regime, increasing illiquidity has a disciplining effect on firms because of increased strategic substitutability, and

may therefore be Pareto improving for some values of the parameters.

The choice of an optimal measurement regime for financial intermediaries is currently one of the most contentious and important topics for practitioners. We have sketched an economic analysis of this issue that illuminates the reasons for the controversy. In an environment where the only contractible valuations of assets are their prices in an illiquid market, measurement policies affect firms' actions, and these actions, in turn, affect prices. Thus, prices affect measurements, but these measurements also have a feedback effect on prices. We have compared a measurement regime based on past price—historical cost—with a regime based upon current price—mark-to-market. The historical cost regime is inefficient because it ignores price signals. This leads to excess conservatism. However, in trying to extract the informational content of current prices, the mark-to-market regime damages this content by adding a purely speculative component to price fluctuations. As a result, the choice between these measurement regimes boils down to a dilemma between ignoring price signals, or relying on their degraded versions. The historical cost regime may sometimes dominate the mark-to-market regime when assets have a long duration, trade in a very illiquid market, or feature an important downside risk. These results help explain why the application of the regulatory mark-to-market reforms to financial institutions have been so contentious. A large proportion of the balance sheets of financial institutions consists precisely of items that are of long duration, illiquid and senior.

Our results also suggest that there are winners and losers in the shift to a full mark-to-market regime. When the financial system is populated by those institutions who can potentially lose from the move (perhaps the bank-dominated continental European financial systems), then the overall desirability of the move to full mark-to-market accounting should be considered

seriously. This is not to deny that such a transition is a desirable long-run aim. In the long run, large mispricings in relatively illiquid secondary markets would likely trigger financial innovations in order to attract new classes of investors. This enlarged participation would in turn enhance liquidity, a situation in which our analysis shows that marking to market becomes more efficient. A natural route for future research is to endogenize market participation and thus liquidity in our setup, so as to analyze how a careful transition towards market-based measurements could trade off the costs we have emphasized with the long-run benefits from a higher reliance on price signals.

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