

Should financial institutions mark-to-market?

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There has been a spirited debate about the merits of mark-to-market accounting for financial institutions for some time now. Many argue that market prices provide the best estimate of value available and should always be used. However, others suggest that in times of crisis market prices are not a good reflection of value and their use can lead to serious distortions. This article explains the circumstances where market prices do reflect future earning power and those where market imperfections imply that they do not. We suggest that in financial crisis situations where liquidity is scarce and prices are low as a result, market prices should be supplemented with both model-based and historic cost valuations. The rest of the time and in particular when asset prices are low because expectations of future cash flows have fallen, mark-to-market accounting should instead be used.

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There has been an extensive debate in recent years on the advantages and disadvantages of moving towards a full mark-to-market accounting system for financial institutions such as banks and insurance companies. This debate was initiated with the move of the International Accounting Standards Board (IASB) and the US Financial Accounting Standards Board (FASB) to make changes in this direction as part of an attempt to standardise accounting standards across countries. The debate has two opposing views. On the one hand, mark-to-market accounting has the advantage of reflecting the true (and relevant) value of the balance sheets of financial institutions and therefore of allowing regulators, investors and other users of accounting information to better assess the risk profile of financial institutions. On the other hand, mark-to-market accounting is thought to lead to excessive and artificial volatility. As a consequence, under this accounting system the value of the balance sheets of financial institutions may be driven by short-term fluctuations in the market that do not reflect the value of the fundamentals and the long-term values of assets and liabilities.

If financial markets operated perfectly in the way that the models used by financial institutions usually assume, then mark-to-market accounting would indeed be best. In this situation, market prices accurately reflect the future earning power of assets. If the market value of an institution's assets falls below the market value of its liabilities then it will not be able to meet all of its obligations. Mark-to-market accounting will indicate this shortfall to regulators, investors, depositors and other interested parties and they can take action accordingly.

Many people have argued that financial markets are effectively perfect and complete. However, in times of crisis it appears that they do not work in the way that they would if this was the case. This notion is a very old one. Bagehot (1873), for example, suggested that in response to crises central banks should value bank collateral weighting panic and pre-panic prices as market prices are not accurate measure of values in those circumstances. A more recent illustration of the malfunctioning of market prices was provided a decade ago by the demise of Long-Term Capital Management (LTCM). This was a hedge fund that

made convergence trades. These involved finding securities whose returns were highly correlated but whose prices were slightly different. The fund would then short (*i.e.* borrow) the one with the high price and use the proceeds to go long in the one with the low price. The convergence trades that LTCM took included the sovereign bonds of European countries that were moving towards European Monetary Union, and on-the-run and off-the-run US government bonds. Since the price differences were small the strategy involved a large amount of borrowing. For example, at the beginning of 1998, the firm had equity of about USD 5 billion and had borrowed over USD 125 billion. In the first two years of the fund's existence it was extremely successful and earned returns for its investors of around 40 percent. However, 1997 was not as successful with a return of 27 percent which was about the same as the return on equities that year.

On August 17, 1998 Russia devalued the rouble and declared a moratorium on about 281 billion roubles (USD 13.5 billion) of government debt. Despite the small scale of the default, this triggered a global crisis with extreme volatility in many financial markets. Many of the convergence trades that LTCM had made started to lose money as the flight to quality caused prices to move in unexpected directions and to diverge from discounted expected future cash flows. By September 22, 1998 the value of LTCM's capital had fallen to USD 600 million. The Federal Reserve Bank of New York coordinated a rescue whereby the banks that had lent significant amounts to LTCM would put USD 3.5 billion for 90 percent of the equity of the fund and take over the management of the portfolio. The Federal Reserve Bank of New York justified its action of facilitating a private sector bailout of LTCM by arguing that if the fund had been liquidated many prices in illiquid markets would have fallen and this would have caused further liquidations and so on in a downward spiral.

The current crisis that started at the end of July 2007 provides yet another illustration of the fact that markets are imperfect and prices do not reflect fundamentals. Some banks have had to write down the AAA-rated super senior tranches of collateralised debt obligations (CDOs) by as much as 30 percent¹ due to a fall in their market prices. If this change in price was due to deterioration in fundamentals then

¹ See Tett (2008).

it would be necessary to believe that the ultimate percentage loss would be 38 percent. This would be justified, if, for example, three quarters of households with subprime securitised mortgages would default and price falls would continue. This seems, however, implausible given that none of the AAA-rated tranches have yet defaulted and, as the Bank of England also estimated, there should not be any future default in AAA-rated subprime mortgage-backed securities (MBS), even with a continued decline in US house prices.² This suggests that factors other than future discounted cash flows are driving prices. Still, because of the use of fair value accounting, financial companies around the world have been hit by more than USD 300 billion in writedowns and been forced to raise more than USD 260 billion from outside investors since last year, according to analysts at the Bank of America.³

What are the market imperfections that led to such large fluctuations in prices in situations such as the Russian Crisis of 1998 and the current crisis? In our paper entitled "Mark-to-market accounting and liquidity pricing",⁴ we analyse the effects of using mark-to-market accounting when financial markets are imperfect. The main insight is that in times of financial crisis the interaction of institutions and markets can lead to situations where prices in markets do not reflect future payoffs but rather reflect the amount of cash or liquidity available to buyers in the market. If mark-to-market accounting is used, then the volatility of asset prices directly affects the value of banks' assets. This can lead to contagion and force banks into insolvency even though they would be fully able to cover their commitments if they were allowed to continue to operate until the assets mature. In contrast, if historic cost accounting is in use, this problem does not compromise the solvency of banks as it does not affect the accounting value of their assets. Thus, historical cost accounting may prevent crises which would occur under mark-to-market accounting.

The result that mark-to-market accounting can be distortionary and generate "artificial" contagion is due to imperfections in the supply of liquidity. In a world of perfect and complete markets risk management can easily ensure that the bank or intermediary

has the correct amount of liquidity in every situation. With perfect and complete markets it is possible to use a full set of derivatives and other securities (or equivalently dynamic trading strategies) to ensure liquidity is received from counterparties in every situation when it is needed; or in technical terms, in every state of the world.

In contrast when markets are imperfect because they are incomplete, liquidity provision is achieved by selling assets in the market when the liquidity is required. Asset prices are determined by the total available liquidity or in other words by the "cash in the market". It is necessary that some financial institutions hold liquidity and stand ready to buy assets when they are sold. They are no longer compensated for the cost of providing liquidity in each and every state as with complete markets. Instead the cost must be made up on average across all states and this is where the problem lies.

The providers of liquidity have the alternative of investing in high return, but less liquid, long assets. There is an opportunity cost to holding liquidity since this has a lower return than the long assets. In order for financial institutions to be willing to supply liquidity they must be able to make a profit in some situations. If nobody held liquidity then when banks and intermediaries sold assets to acquire liquidity their price would collapse to zero. This would provide an incentive for some institutions to hold liquidity since they can acquire assets very cheaply in these situations. In equilibrium prices will be bid up to the level where the profit in these situations where banks and intermediaries sell is sufficient to compensate the providers of liquidity for all the other situations where they do not use the liquidity and simply bear the opportunity cost of holding it. In other words asset prices are low in the situations where there is an aggregate shortage of liquidity and some banks and intermediaries need liquidity.⁵

An important aspect of this analysis is that the low asset prices that occur in situations where there is a shortage of liquidity do not require there to be informational problems. However, it is certainly the case that informational problems exacerbate the falls

² See Giles and Tett (2008).

³ See Guerrero and Hughes (2008).

⁴ See Allen and Carletti (2008).

⁵ See Allen and Gale (2007) for a full account of this.

in price. If buying institutions, in addition to bearing the opportunity cost of holding liquidity, need to expend significant resources to evaluate the assets they are purchasing, equilibrium prices will be even lower. Now prices must be low enough to cover in addition the cost of due diligence. This is particularly important for securitisations of subprime mortgages and is consistent with the large fall in their prices in the current crisis. Finally, if there are problems of adverse selection, this will further exacerbate the necessary discount the assets trade at.

Based on these arguments mark-to-market accounting has significant drawbacks. As many have argued it leads to large changes in financial institutions' balance sheets that are not justified by the fundamentals. These changes do not reflect an inability to meet future commitments and so do not reflect insolvency. When historic cost accounting is used these problems are avoided to a large extent. However, historic cost accounting also has drawbacks. In particular, if price changes do reflect fundamentals then historic cost accounting is not desirable and mark-to-market is superior.

A good example where historic cost accounting failed where mark-to-market would probably not have done is the Savings and Loan Crisis in the United States in the 1980's. Here the fall in the prices of the assets was due to a collapse in the fundamentals. The fall in oil prices meant that the expected future cash flows from many properties in Texas and other oil-producing states fell drastically. These price falls were not due to temporary liquidity factors of the type discussed above but instead were permanent. In this case historic cost accounting allowed banks to hide the extent of their problems for a significant period of time. Mark-to-market accounting would have led to a much quicker recognition and resolution of the problem.

This contrast between situations where asset prices are low because of liquidity factors and where they are low because of lower expected cash flows is at the center of the debate over the advantages and disadvantages of mark-to-market accounting *versus* historic cost accounting. The problem is that neither system is perfect. Each works in some circumstances but not in others. Both sides have validity in the arguments that they make.

How can the problem be solved? A recent report of the Institute of International Finance also argues that marking-to-market can create a downward spiral in asset prices and artificially transform a liquidity problem into a solvency one. According to the report, one way to solve the problem is to allow banks to value instruments using their own models or book value when markets are disrupted; and to give banks the possibility to move assets from trading books onto banking books, where assets are "held to maturity" and mark-to-market rarely applies.⁶ The report has the merit that it stresses once again the difficulty and the problems linked to the use of mark-to-market in disrupted markets. The problem with this suggestion, however, is that it leads to a potential moral hazard problem if banks are allowed to "park" volatile risky assets from the trading books in the banking books till market conditions are restored to normal.

What in our view is of crucial importance is to provide the users of accounting information such as regulators and investors with the information that allows them to understand at a deeper level what is happening and how this should affect their actions. Mark-to-market values are useful and should certainly be disclosed. However, there needs to be additional information to allow users to identify the extent to which falls in asset prices are due to market conditions such as liquidity factors and the extent to which they are due to changes in discounted expected future cash flows. If the users of accounting information can distinguish between these factors they will be in a much better position to decide how to proceed. This is also in line with the suggestion of the Bank of England that auditors need "authoritative guidance" on the application of fair-value accounting rules when market prices are dislocated from fundamentals values.⁷

What information that is easily available can be used for this purpose? The IASB promulgates the International Financial Reporting Standards (IFRSs) that apply to all listed European Union/European Economic Area companies. The FASB determines Generally Accepted Accounting Principles (GAAP) and these together with Securities and Exchange Commission (SEC) regulations determine the way that companies in the United States report their results. The approach of both for determining the

⁶ See Mackintosh (2008).

⁷ See Giles and Tett (2008).

fair values of financial instruments as outlined in IFRS 7 and FAS 7 are similar. However, the latter is more specific.⁸ It specifies three levels. Level-one valuations, which are to be used if available, are based on observable prices in liquid markets. Level-two valuations are based on prices on nearby dates or prices of very similar instruments. These are to be used if level-one valuations are not available. Finally, level-three valuations allow the use of theoretical valuation models. For example, for MBS, these might involve assumptions concerning default rates and loss ratios. These model-based valuations require disclosure of the model assumptions. They are used when level-one and level-two valuations are not available.

These three valuation methods should give very similar results most of the time. In such cases there is no point in disclosing anything other than level-one valuations based on observable prices in liquid markets as is currently done. In times of crisis, though, the different methods can give very different values. The example above during the current crisis of the 30 percent fall in the market prices of AAA-rated super senior tranches of CDOs is one where model-based valuations using plausible assumptions would give significantly higher values.

Rather than the current approach of only using level-three valuations when level-one and -two valuations are unavailable, an alternative would be to also report level-three valuations if they differ significantly from level-one (or level-two) valuations. One possible threshold for triggering the reporting of both valuations would be a difference of 5 percent, for example. In such circumstances, it may also be helpful to report historic cost values, since these are more objective than level-three valuations given they do not require extensive assumptions. The reporting of multiple values would alert regulators, investors and other users to the fact that they need to investigate more carefully what is happening in the markets where prices are determined. This will allow them to use better judgment as to whether the banks and other financial institutions are insolvent or not and to investigate more thoroughly whether the institutions are able to meet their future obligations. In case they are, regulators should probably practice a form of "forbearance" in that they should allow banks not to fully write down the value of their assets according to market conditions, in order to avoid artificial volatility and its consequent solvency impairment. This would help to eliminate the procyclicality problem implied by fair value accounting as there would be no need for banks to raise further capital.

In conclusion, we have argued that both sides in the debate of mark-to-market versus historic cost accounting have merit. Mark-to-market works well and reflects the true underlying situation most of the time. However, in crisis times when there is a shortage of liquidity, mark-to-market values do not reflect future earning power and cannot be used to assess the solvency of financial institutions. The crisis starting in late July of 2007 has provided some examples of this. In these circumstances market prices are driven by liquidity provision incentives and not fundamental values. In such cases historic cost accounting can provide a better indication of true value. However, historic cost accounting has the drawback that it misses drops in value that are caused by deterioration in the discounted expected cash flows as the proponents of mark-to-market accounting suggest.

Our solution to this problem is to adapt mark-to-market accounting using easily available information. When model-based valuations based on plausible assumptions differ by more than (say) 5 percent from market based valuations, both types of valuation together with traditional historic cost valuations should be provided. This will signal to the users of information that they need to be careful to identify what is going on in the markets. This is not a perfect system but it is practical and it will be an improvement over the current one.

⁸ See International Monetary Fund (2008), chapter 2, annex 2.1.

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