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Fair Value Accounting and Procyclicality: Regulatory Challenges

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The crisis of fair-value accounting: Making sense of the recent debate

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A B S T R A C T

The recent financial crisis has led to a vigorous debate about the pros and cons of fair-value accounting (FVA). This debate presents a major challenge for FVA going forward and standard setters' push to extend FVA into other areas. In this article, we highlight four important issues as an attempt to make sense of the debate. First, much of the controversy results from confusion about what is new and different about FVA. Second, while there are legitimate concerns about marking to market (or pure FVA) in times of financial crisis, it is less clear that these problems apply to FVA as stipulated by the accounting standards, be it IFRS or US GAAP. Third, historical cost accounting (HCA) is unlikely to be the remedy. There are a number of concerns about HCA as well and these problems could be larger than those with FVA. Fourth, although it is difficult to fault the FVA standards per se, implementation issues are a potential concern, especially with respect to litigation. Finally, we identify several avenues for future research.

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Introduction

The recent financial crisis has turned the spotlight on fair-value accounting (FVA) and led to a major policy debate involving among others the US Congress, the European Commission as well as banking and accounting regulators around the world. Critics argue that FVA, often also called mark-to-market accounting (MTM),¹ has significantly contributed to the financial crisis and exacerbated its severity for financial institutions in the US and around the world.² On the other extreme, proponents of FVA argue that

it merely played the role of the proverbial messenger that is now being shot (e.g., Turner, 2008; Veron, 2008).³ In our view, there are problems with both positions. FVA is neither responsible for the crisis nor is it merely a measurement system that reports asset values without having economic effects of its own.

In this article, we attempt to make sense of the current fair-value debate and discuss whether many of the arguments in this debate hold up to further scrutiny. We come to the following four conclusions. First, much of the controversy about FVA results from confusion about what is new and different about FVA as well as different views about the purpose of FVA. In our view, the debate about FVA takes us back to several old accounting issues, like the tradeoff between relevance and reliability, which have been debated for decades. Except in rare circumstances, standard setters will always face these issues and tradeoffs; FVA is just another example. This insight is helpful to better understand some of the arguments brought forward in the debate.

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¹ Strictly speaking, FVA is broader than MTM accounting, as the latter is only one way of determining the fair value. We therefore use the term FVA throughout unless we specifically mean marking to a market price.

² For example, the American Bankers Association in its letter to the SEC in September 2008 states: "The problems that exist in today's financial markets can be traced to many different factors. One factor that is recognized as having exacerbated these problems is fair-value accounting." Similar concerns are also shared by the US Congress, which put a strong pressure on FASB to change the accounting rules. See also, e.g., Forbes (2009), Wallison (2008a, 2008b), and Whalen (2008).

³ A related but different argument is that FVA provides important messages that should not be ignored (Ball, 2008).

Second, there are legitimate concerns about marking asset values to market prices in times of financial crisis once we recognize that there are ties to contracts and regulation or that managers and investors may care about market reactions over the short term. However, it is not obvious that these problems are best addressed with changes to the accounting system. These problems could also (and perhaps more appropriately) be addressed by adjusting contracts and regulation. Moreover, the concern about the downward spiral is most pronounced for FVA in its pure form but it does *not* apply in the same way to FVA as stipulated by US GAAP or IFRS. Both standards allow for deviations from market prices under certain circumstances (e.g., prices from fire sales). Thus, it is not clear that the standards themselves are the source of the problem.

However, as our third conclusion highlights, there could be implementation problems in practice. It is important to recognize that accounting rules interact with other elements of the institutional framework, which could give rise to unintended consequences. For instance, we point out that managers' concerns about litigation could make a deviation from market prices less likely even when it would be appropriate. Concerns about SEC enforcement could have similar effects. At the same time, it is important to recognize that giving management more flexibility to deal with potential problems of FVA (e.g., in times of crisis) also opens the door for manipulation. For instance, managers could use deviations from allegedly depressed market values to avoid losses and impairments. Judging from evidence in other areas in accounting (e.g., loans and goodwill) as well as the US savings and loans (S&L) crisis, this concern should not be underestimated. Thus, standard setters and enforcement agencies face a delicate tradeoff (e.g., between contagion effects and timely impairment).

Fourth, we emphasize that a return to historical cost accounting (HCA) is unlikely to be a remedy to the problems with FVA. HCA has a set of problems as well and it is possible that for certain assets they are as severe, or even worse, than the problems with FVA. For instance, HCA likely provides incentives to engage in so-called "gains trading" or to securitize and sell assets. Moreover, lack of transparency under HCA could make matters worse during crises.

We conclude our article with several suggestions for future research. Based on extant empirical evidence, it is difficult to evaluate the role of FVA in the current crisis. In particular, we need more work on the question of whether market prices significantly deviated from fundamental values during this crisis and more evidence that FVA did have an effect above and beyond the procyclicality of asset values and bank lending.

The paper proceeds as follows. First, we provide a quick overview over FVA and some of the key arguments for and against FVA. Second, we compare FVA and HCA and shortly discuss fundamental tradeoffs involved when choosing one or the other. Third, we discuss the concern that FVA contributes to contagion and procyclicality as well as ways to address this concern, including how current accounting practices help to alleviate problems of contagion. Fourth, we consider potential implementation problems. Fifth,

we take a closer look at the banks' positions on FVA. Sixth, we conclude with suggestions for future research.

Fair-value accounting: What is it and what are the key arguments?

FVA is a way to measure assets and liabilities that appear on a company's balance sheet. FAS 157 defines fair value as "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." When quoted prices in active markets for identical assets or liabilities are available, they have to be used as the measurement for fair value (Level 1 inputs). If not, Level 2 or Level 3 inputs should be used. Level 2 applies to cases for which there are observable inputs, which includes quoted prices for similar assets or liabilities in active markets, quoted prices from identical or similar assets in inactive markets, and other relevant market data. Level 3 inputs are unobservable inputs (e.g., model assumptions). They should be used to derive a fair value if observable inputs are not available, which is commonly referred to as a mark-to-model approach.

Fair value is defined similarly under IFRS as the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arm's length transaction. In determining fair value, IFRS make similar distinctions among inputs as FAS 157: Quoted prices in active markets must be used as fair value when available. In the absence of such prices, an entity should use valuation techniques and all relevant market information that is available so that valuation techniques maximize the use of observable inputs (IAS 39). It is recognized that an entity might have to make significant adjustments to an observed price in order to arrive at the price at which an orderly transaction would have taken place (e.g., *IASB Expert Advisory Panel, 2008*).

Under both US GAAP and IFRS, fair values are most frequently used for financial assets and liabilities. But even for financial assets and liabilities, there is a mixed attribute model with a multitude of rules stipulating that some items are reported at fair value and others are reported at historical cost. Moreover, unrealized gains and losses of items that are reported at fair value may or may not affect net income, depending on their classification. For instance, FAS 115, which was already implemented in 1994, requires that both trading securities and available-for-sale securities are reported in the balance sheet at fair value. But in the income statement, unrealized gains and losses, i.e., changes in these values, are recognized for trading securities only. In contrast, financial instruments that are held-to-maturity are reported at amortized costs but fair values could be used in determining impairments for these items. In addition, fair values are used for disclosures in the notes to the financial statements (e.g., FAS 107).

Proponents argue that fair values for assets or liabilities reflect current market conditions and hence provide timely information, thereby increasing transparency and encouraging prompt corrective actions. Few dispute that transparency is important. But the controversy rests on

whether FVA is indeed helpful in providing transparency and whether it leads to undesirable actions on the part of banks and firms. Opponents claim that fair value is not relevant and potentially misleading for assets that are held for a long period and, in particular, to maturity; that prices could be distorted by market inefficiencies, investor irrationality or liquidity problems; that fair values based on models are not reliable; and that FVA contributes to the procyclicality of the financial system.⁴

Historical cost accounting as an alternative

In discussing the potential problems of FVA, it is important to also consider the alternative. Naturally, the relevant alternative depends on the assets in question. Few would argue that historical cost accounting (HCA) is an alternative for liquid assets (e.g., stocks) in banks' trading books. But for many, HCA is an alternative for loans, in particular, if they are held to maturity. Similarly, if we were to suspend FVA for illiquid assets in times of crisis as many have suggested, what values would we use instead? Even if one is sympathetic to the arguments against FVA, it does not automatically follow that HCA would be better, although many opponents of FVA implicitly or explicitly assume so. At times, FVA may not provide relevant information, but in many cases, (amortized) historical costs do not provide relevant information either. Moreover, even when an investor intends to hold financial assets until her retirement, she may still have an interest in the current value of these assets. Why does this logic not also apply to disclosures about a firm's financial assets? That is, even for assets that are held to maturity (e.g., loans), investors might care about current market values, be it to evaluate past decisions in light of current market conditions or because investors have some doubts that the firm (or bank) can hold these assets to maturity. Similarly, when bank regulators set capital requirements based on *expected* future losses at the time of the transaction, we would expect them to adjust required capital when expectations about future losses change – and not just when losses are realized. It is surprising that some commentators seem to believe that HCA is a sound basis for capital requirements or that the liquidity of an asset should play no role when market values and liquidity play an important role in determining (ongoing) margin or collateral requirements.⁵ Aside from highlighting some of the shortcomings of HCA, these examples also illustrate that it is important to be explicit about the presumed goal(s) of accounting when we debate the merits of FVA and other alternatives, such as HCA,

because their relative merits likely depend on the goal(s) of accounting.

Furthermore, take the concern that observed prices may not always reflect true fundamental values and that in those cases marking-to-market is not appropriate. Clearly, it is conceivable that, at times, observed market prices deviate from fundamentals. That is, markets may not be efficient with respect to publicly available information at all times. There are transaction costs and limits to arbitrage, and market prices may be subject to behavioral biases and investor irrationality (e.g., Barberis & Thaler, 2003; Shleifer, 2000). Moreover, a liquidity crunch can affect market prices (e.g., Shleifer & Vishny, 1992).

The important question, however, is how to deal with this problem. Potential market inefficiencies can be addressed in a variety of ways and again HCA is not the only alternative. Historical costs do not reflect the current fundamental value of an asset either. Therefore, it might be better to use market values, even if the markets are illiquid, and to supplement them with additional disclosures, e.g., about the fundamental value of the asset when held to maturity. FVA does not prevent firms from providing additional information, including management's estimates of fundamental values.⁶ One might counter this argument with the concern that investors may overlook information in the notes to the financial statements or that they would overreact to fair values based on current market prices despite the disclosure of (higher) fundamental values in the notes. However, we are not aware of any empirical evidence that investors systematically ignore or overlook information in the notes. Having said that, there is a legitimate debate over whether the market fully and correctly impounds financial information in price (e.g., Kothari, 2001). For instance, the market could overreact (e.g., DeBondt & Thaler, 1985).

But it is also possible that market reactions are even more extreme if current market prices or fair-value estimates are not disclosed to the market. We are not aware of any empirical evidence that investors would be calmer under HCA. Investors are not naïve; they know about the problems, e.g., in the subprime-loan market, and hence will draw inferences even in the absence of fair-value disclosures (and in that case might assume the worst). Thus, lack of transparency could make matters worse. Furthermore, even if investors were to react more calmly under HCA, this may come at the price of delaying and increasing the underlying problems (e.g., excessive subprime lending). This latter point again illustrates that, to make a case against FVA, it is important to consider not only the costs of FVA, but also the costs of the alternative(s), including their incentive effects during normal or boom times. Otherwise, we fall victim to an accounting version of the Nirvana fallacy.

Setting accounting standards always involves tradeoffs, and any accounting regime will have costs and benefits. As

⁴ For summaries of the pros and cons of FVA and further references, see Barth (2004), Benston (2008), Penman (2007), and Ryan (2008). There is also a large literature on the value relevance of accounting numbers, which often analyzes fair values. See surveys by Barth et al. (2001) and Holthausen and Watts (2001).

⁵ It is worth pointing out that collateral and margin calls can trigger a downward spiral, i.e., increased collateral or margin requirements and falling prices can reinforce each other (Brunnermeier & Pedersen, 2009; Shleifer & Vishny, 1992). However, this spiral is not related to the accounting system; it results from the use of market values in bilateral contracts. See Section 'Fair-value accounting, illiquidity, and financial crises' for a discussion of the potential role of FVA.

⁶ It is perhaps telling that we do not yet have more compelling evidence that securities are or were trading at market prices substantially below their fundamental values during the current crisis, and that banks are not volunteering such evidence. We will come back to this issue in Section 'Conclusion and suggestions for future research'.

the tradeoffs are likely to differ across firms (or industries) and assets, it is unlikely that FVA (or HCA) is always or even generally preferred. Furthermore, it is important to remember that the reason why accounting rules are relevant is that we are living in an imperfect world. In a world of complete and perfect markets, reporting the market values of a firm's assets would be optimal but also superfluous (e.g., Beaver, 1981). In an imperfect world with frictions and information problems, however, the optimal solution could look very different and hence it is not clear that using market values when they are available or approximating market values with our accounting measurements is even desirable (see also Plantin, Sapra, & Shin, 2008a). As the "Theory of the Second Best" cautions, removing one imperfection in an imperfect world does not necessarily lead to welfare improvements. For instance, it is possible that a mixed-attributes model that treats certain assets and liabilities differently is optimal, even though this model appears to be inconsistent from a measurement perspective. We need a careful economic analysis of the tradeoffs, including incentive and real effects, and have to recognize that the tradeoffs likely differ across assets, business models, and uses of accounting numbers.⁷

Fair-value accounting, illiquidity, and financial crises

FVA and its application through the business cycle have been subject to considerable debate (e.g., Banque de France, 2008; ECB, 2004; IMF, 2008). The chief concern is that FVA is procyclical, i.e., it exacerbates swings in the financial system, and that it may even *cause* a downward spiral in financial markets. There are essentially two arguments why FVA can contribute to procyclicality: one in booms and one in busts.⁸

The first argument is that FVA and asset write-ups allow banks to increase their leverage in booms, which in turn makes the financial system more vulnerable and financial crises more severe (e.g., Persaud, 2008; Plantin, Sapra, & Shin, 2008b).⁹ In contrast, HCA prohibits asset write-ups in booms and creates "hidden" reserves, which can be drawn upon in times of crisis. However, this argument ignores that FVA provides early warning signals for an impending crisis and hence may force banks to take appropriate measures earlier.¹⁰ Thereby, FVA may actually reduce the severity of a crisis. Moreover, a key question is why a bank would hold these hidden reserves under HCA and essentially choose a

lower leverage (or why it would not be willing to hold higher reserves if they are not hidden under FVA). One possibility is that a bank's leverage is driven by its book equity rather than the market value of equity because of regulatory capital requirement. HCA and a fixed regulatory capital ratio based on book values indirectly result in dynamic prudential regulation where banks have a lower leverage ratio (measured in terms of market values) in booms when fair values exceed historical costs than in recessions. However, it is important to recognize that a bank can also increase its leverage in boom periods under HCA by selling an asset and retaining only a small claim in it (or guaranteeing its performance), as banks did when they securitized loans. Thus, we do not think that the tendency of banks to expand leverage in booms is an issue that merely arises under FVA. Besides, it is not clear that procyclical lending should be addressed by adjusting the accounting rules. For instance, we could combine FVA with dynamic prudential regulation, i.e., forcing banks to build up larger reserves in good times and to draw on them in bad times, in order to counter the procyclical effects of capital requirements on lending (e.g., Kashyap & Stein, 2004). Put differently, it might be more appropriate to adjust banking regulation, rather than the accounting system, given that accounting numbers are used in many other contexts.

The second argument is that FVA can provoke contagion in financial markets. The basic idea is that banks may (have to) sell assets at a price below the fundamental value and that the price from these (forced) sales becomes relevant to other institutions that are required by FVA to mark their assets to market (Allen & Carletti, 2008; Plantin et al., 2008a). This argument requires that there are some direct or indirect ties to the accounting system, which trigger the sale of the assets. Allen and Carletti (2008) show that accounting-based regulatory capital requirements for banks can lead to contagion. Bond covenants are often also based on accounting numbers and can create contractual ties. Plantin et al. (2008a) show that a management focused on short-term accounting earnings can create similar effects, essentially because they care about current market prices which produces indirect ties. Similarly, rating agencies can create indirect ties by using accounting information and issuing ratings that are used in debt contracts or capital requirements.

The models by Allen and Carletti (2008) and Plantin et al. (2008a) show that FVA in its *pure* form, i.e., marking to market prices under any circumstances, can create contagion effects. The next question is how (and where) to respond to these effects. One alternative is to use HCA. Valuing assets at historical costs essentially insulates banks from market prices and therefore also from prices that are established by the trading activities of other banks and from potential negative spill-over effects.¹¹ But as Plantin et al. (2008a) point out, HCA may create incentives for banks to engage in inefficient asset sales to realize

⁷ This point also highlights that measuring assets and liabilities in a consistent way is not a goal per se. See also Gjesdal (1981) and Paul (1992) showing more broadly that the optimal accounting system depends on what we use the accounting numbers for.

⁸ It is important to recognize that procyclicality of FVA is more than simply reporting cycles in asset prices. That is, the expression makes only sense if we have in mind that the accounting system exacerbates the cycles in the financial system or the real economy. See Barth (2004) for a discussion of how FVA can contribute to the volatility of the accounting numbers.

⁹ Adrian and Shin (2008) provide evidence on a positive relation between changes in asset values and changes in leverage ratios for major (former) US investment banks.

¹⁰ The US S&L crisis provides a case in point. Allen and Carletti (2008) and others argue that FVA would have helped to identify the problems leading to the S&L crisis earlier.

¹¹ Note that this is only true if these prices are not also relevant for (other than temporary) impairment testing. If they are, the same effects occur under HCA with impairments. However, the distinction between temporary and other-than-temporary impairments generally makes HCA less sensitive in practice.

earnings early. The importance of this problem in practice should not be underestimated. The concern about banks' ability to engage in so-called "gains trading," i.e., selectively selling financial instruments with unrealized gains and keeping those with losses, was a major impetus for introducing FVA for financial instruments (e.g., Schulz & Hollister, 2003; Wyatt, 1991). Moreover, securitizations of loans, which were accounted for at amortized costs and traditionally held to maturity, could be driven by banks' desire to realize accounting earnings early. Prior to the crisis, the market for securitized loans was reasonably liquid and gave banks an opportunity to recognize substantial gains from loan origination. Thus, those who criticize FVA and call for a return to HCA have to be careful: HCA for loans coupled with banks' short-term incentives may in fact have contributed to the recent surge of securitizations. This example again illustrates our broader point in Section 'Historical cost accounting as an alternative' that even if there are potential problems with FVA such as contagion effects, it is not clear that HCA is the solution to these problems.

An alternative way to tackle the procyclicality of the accounting system is to deviate from market prices in situations when contagion is likely to occur. Both US GAAP and IFRS allow such deviations in certain circumstances. First, the standards explicitly state that market prices from forced sales should not be used, which protects against negative spillovers from distressed banks. Second, the standards allow the use of valuation models to derive fair values when markets become inactive, which should also mitigate contagion effects in a financial crisis. Third, US GAAP and, more recently, also IFRS allow for a re-classification of fair-value assets into a category to which HCA and less stringent impairment tests apply. Thus, US GAAP and IFRS have mechanisms to avoid negative spillovers in distressed markets and a downward spiral.¹²

Yet another way to address contagion and procyclicality is not to have direct (mechanical) regulatory or contractual ties to FVA. For instance, it would be possible to adjust the accounting numbers for the purpose of determining regulatory capital. Such adjustments already exist. For example, for the purpose of calculating regulatory capital, the Federal Deposit Insurance Corporation and the Federal Reserve adjust banks' equity as reported under US GAAP for unrealized losses and gains for available-for-sale (AFS) debt securities to obtain Tier 1 capital (e.g., Schedule HC-R in FRY-9C). Thus, regulatory capital as calculated by US banking regulators is not affected by changes in the fair value of AFS debt securities, unless they are sold or the impairments are other-than-temporary.¹³ Similarly, Li (2008) documents that

debt contracts often exclude fair-value changes in accounting-based debt covenants. These examples demonstrate that it is not clear that contagion and procyclicality are best addressed directly in the accounting system. Perhaps these issues are better left to the prudential regulators and contracting parties, who in turn can make adjustments to the numbers reported in the financial statements as they see fit. In our view, this is an interesting issue for future research.

In summary, Allen and Carletti (2008) and Plantin et al. (2008a) provide important contributions to the FVA debate by illustrating potential contagion effects. However, they do not show that HCA would be preferable. In fact, Plantin et al. (2008a) are quite explicit about the problems of HCA. Furthermore, they do not speak directly to the role of FVA in the current crisis because they do not model FVA as implemented in practice. As noted above, FVA as required by US GAAP or IFRS as well as US regulatory capital requirements for banks have mechanisms in place that should alleviate potential contagion effects. Whether these mechanisms work properly in practice is our next question.

Are there implementation problems with fair-value accounting standards?

Given the discussion in the preceding section, it is not obvious that extant accounting standards can be blamed for causing contagion effects. But it is possible that, in practice or in crises, the standards do not work as intended. Ultimately, this is an empirical question and answering it is beyond the scope of this article. But we can at least raise and discuss two important implementation issues.

First, many have argued that both the emphasis of FAS 157 on observable inputs (i.e., Level 1 and Level 2) and extant SEC guidance make it very difficult for firms to deviate from market prices, even if these prices are below fundamentals or give rise to contagion effects (e.g., Bigman & Desmond, 2009; Wallison, 2008a). Consistent with these claims, the relevant standards in US GAAP and IFRS as well as guidance for these standards are quite restrictive as to when it is appropriate for managers to deviate from observable market prices.¹⁴ However, such restrictions should not be surprising. By allowing deviations from market price in some instances, standard setters face the problem of distinguishing between a situation in which a market price is indeed misleading and a situation in which a manager merely claims that this is so in order to avoid a write-down. Without restrictive guidance, the standards could be easily gamed. There is evidence that managers can be reluctant to take write-downs even when assets are substantially impaired.¹⁵ Consistent with this concern,

¹² However, as we discuss in Section 'Are there implementation problems with fair-value accounting standards?', using these mechanisms may open the door to manipulation. In addition, there have been political pressures to suspend FVA in the crisis. As result, FVA may be used in the upturn and HCA in the downturn, which could be even worse (Brunnermeier, Crocket, Goodhart, Persaud, & Shin, 2009).

¹³ Since other-than-temporary impairments are also recognized under HCA, a shock to AFS debt securities has the same effect on Tier 1 regulatory capital under FVA and HCA for US banks. See also SEC (2008a). As noted earlier, such impairments can trigger contagion effects, but few would argue that eliminating the recognition of other-than-temporary impairments is a reasonable response to the contagion problem.

¹⁴ For instance, the SEC (2008b), the FASB (2008), and the IASB Advisory Panel (2008) all emphasize that, while managers can use models and unobservable inputs, they cannot ignore (the information contained in) market prices, and they also stress that illiquid markets are not necessarily a reason to deviate from observed prices.

¹⁵ See, e.g., Ball, Kothari, and Robin (2000), Beatty, Chamberlain, and Magliolo (1995), Disclosure Insight (2009) and Ramanna and Watts (2007). Indirect evidence is also provided by the observation that "the reported book values of assets at failed banks often overstate economic value (see General Accounting Office, 1990)." (Berger, Herring, & Szegö, 1995, p. 396)

current estimates of banks' loan losses (e.g., Citigroup, 2009; Goldman Sachs, 2009; IMF, 2009) far exceed the write-downs that banks have taken so far and they also exceed the difference between the loans' carrying values and banks' fair-value disclosures for these loans according to FAS 107.¹⁶

These examples illustrate a general problem. Managers have an information advantage over the gatekeepers (e.g., auditors or the SEC) and, as a result, it is difficult to write FVA standards that provide the flexibility when it is needed and constrain managers' behavior when it is not needed. Standard setters face the classic and well-known tradeoff between relevance and reliability: model-based fair values may be more relevant in certain situations but market prices are easier to verify and harder to manipulate. Thus, in a world with information asymmetry, we expect optimal FVA standards and enforcement to constrain some deviations from (distressed or misleading) market prices that would be permitted if the gatekeepers had the same information as the managers. Put differently, restrictive standards or even some contagion effects are the price for timely write-offs when assets are impaired. Again, this is a tradeoff that is important to recognize and difficult to escape in practice.

While this expected feature of second-best standards is one explanation for the criticism of FVA during the crisis, it is clearly also possible that extant rules and guidance are too restrictive (even from a second-best perspective) and that we would have been better off giving managers more flexibility in the crisis.¹⁷ This is in essence the view that the House Financial Services Committee adopted in a hearing on MTM accounting rules on March 12, 2009. As a result of this political pressure, the FASB relaxed the conditions for moving assets into Level 3 in April 2009. However, it is important to note that joint FASB/SEC guidance issued on September 30, 2008 and the FASB Staff Position (FSP FAS 157-3) already state that adjustments to observable inputs and market prices may be necessary and should be considered. Moreover, the financial statements of US banks for fiscal 2008 show that banks have been able to move assets into the Level 3 category as the financial crisis unfolded, so it was clearly not impossible to move to models (see also IMF, 2008). But it is of course possible that banks did not move enough assets into the Level 3 cat-

egory to prevent contagion effects. In the end, we need more research on this issue.¹⁸

A second implementation problem may arise from litigation risk. Deviations from market prices under existing FVA standards require substantial judgement by the preparers and the auditors. However, managers, directors, and auditors face severe litigation risks as well as substantial legal penalties, including prison terms, which recently have been increased by the Sarbanes-Oxley Act of 2002. In this environment, managers, directors, and auditors are likely to weigh the personal costs and risks associated with deviations from market prices differently than investors. For example, it is conceivable that a manager is reluctant to use an appropriate model-based fair value that is higher than an observable price from a very illiquid market, especially when there is substantial down-side risk for the economy or the firm, as there typically is in financial crises.

From a litigation risk perspective, guidance as to when deviations are appropriate is likely to play an important role, especially in litigious environments and when enforcement is strong. Thus, it is possible that, once we recognize the litigation aspect, improvements in the standards' implementation were (and perhaps are still) needed. However, as litigation serves as an important enforcement mechanism, there are tradeoffs as we highlighted earlier in this section for SEC enforcement. This second implementation problem also highlights that it is important to evaluate accounting standards within the context of the institutional environment in which they operate.¹⁹

Banks' positions on fair-value accounting during and before the crisis

In the second half of 2008 when the crisis intensified, banks raised significant concerns about FVA for any but the most liquid assets. They argued that FVA was exacerbating the crisis by creating a downward spiral and that observed market prices were significantly below the assets' fundamental values (e.g., American Bankers Association, 2008; Mortgage Bankers Association, 2008; US Bancorp, 2008). Many large banks in the US and Europe asked for maximum leeway in declaring transactions disorderly and switching to models to determine fair values based on the underlying fundamentals or expected future cash flows (Institute of International Finance, 2008).²⁰ Moreover, banks, in particular in Europe, asked for the option to reclassify financial instruments from the trading

¹⁶ The latter implies that restrictive impairment standards for loans are unlikely to explain the discrepancy. For instance, a Citigroup (2009) research report estimates cumulative loan losses for Bank of America of \$135 billion from the beginning of the crisis in 2008–2011, but according to the 10-K for fiscal 2008 the bank has taken write-downs on its loans of only \$17 billion, created an allowance for loan loss reserves of \$23 billion and discloses only a \$45 billion difference between the book value and the fair value of its loan portfolio.

¹⁷ For instance, some view SEC (2008b) guidance on FVA issued in March 2008 as having exacerbated the problem (e.g., Wallison, 2008a). A report by Goldman Sachs (2008) issued at the time also illustrates the uncertainty surrounding the SEC guidance in March, but the report concludes that the SEC did not change the implementation or tighten the standards. However, the uncertainty about the intention of the guidance (coupled with litigation concerns) may have been enough to deter some preparers from deviating from market prices.

¹⁸ There is evidence that the value relevance of Level 3 fair values during the crisis is below the value relevance of more market-based Level 2 fair values and that moving assets into the Level 3 category is associated with negative returns (e.g., Goh, Ng, & Yong, 2009; Kolev, 2009). However, these results have to be interpreted carefully. For instance, the latter result may reflect primarily the information conveyed from categorizing and moving assets, rather than the underlying accounting methods (or fair-value measurements).

¹⁹ Epstein and Henderson (2009) point to another litigation issue related to lenders' decisions to demand more collateral.

²⁰ However, there were exceptions. For instance, Credit Suisse (2008) and JP Morgan (2008) argued against a suspension of FVA and defended it even during the crisis. Goldman Sachs quit the Institute of International Finance (IIF), the leading bank lobby, over its proposal to change FVA rules (Reuters, July 9, 2008).

category to the held-to-maturity category (e.g., [Guerrera & Hughes, 2008](#); [Tweedie, 2008](#)).

While this opposition could be viewed as (anecdotal) evidence that the concerns about FVA in financial crises are warranted, the arguments could also be self-serving, essentially passing the blame for the crisis to the accounting standards. It might therefore be informative to go back in time to see whether banks embraced FVA prior to the crisis.

Doing so reveals that banks have consistently raised concerns about FVA. For example, in 1999, when the FASB solicited comments on its “Preliminary Views, Reporting Financial Instruments and Certain Related Assets and Liabilities at Fair Value,” the reaction by banks was universally negative (e.g., [Schulz & Hollister, 2003](#)). Banks argued that fair value is not relevant for investors, does not suit the business model of most banks, and is not appropriate for illiquid assets or assets that are held to maturity. Only the US investment banks were somewhat supportive of using fair values for some financial instruments, largely because they were already using fair values for many of their assets for internal reporting and risk management purposes, and even they requested the ability to exercise judgment in valuing financial instruments (e.g., [Goldman Sachs, 2000](#); [Merrill Lynch, 2000](#)). When FASB issued its 2004 Exposure Draft on Fair-Value Measurements (on what later became FAS 157), banks welcomed the improved consistency, clarification and guidance, but pointed out that there were still inconsistencies and suggested that further guidance was needed. Banks also noted that reasonable judgment and flexibility is needed when determining fair values, in particular when Level 3 inputs are used (e.g., [Bank of America, 2004](#); [Morgan Stanley, 2004](#)).

Thus, banks' positions have been reasonably consistent over time and hence one could argue that their criticism of FVA during the crisis is credible given that they have raised concerns even in times when FVA may have allowed them to show higher valuations than HCA. However, as discussed above, FVA is not needed to capitalize on higher valuations during boom times when markets are liquid: banks can simply sell and repurchase an asset to recognize unrealized valuation gains that have occurred since the asset's acquisition. In fact, unlike FVA, HCA allows banks to choose *when* to realize the gains. Moreover, impairment testing under HCA is less strict and arguably offers more discretion than FVA. This greater flexibility in both directions under HCA certainly has a value for bank managers as it shields them from capital-market scrutiny (for better or worse), allows them to accumulate hidden reserves, and lets them realize gains and losses strategically. Therefore, banks' opposition to FVA mingles potentially well-founded concerns with a general desire for flexibility and, hence, it is not obvious that banks' long-standing opposition to FVA lends credibility to their current arguments.

In contrast to the banks' views, investor interest groups and accountants are considerably less concerned about FVA, even in the current crisis, and warn against a suspension of FVA. For example, in a joint letter to the SEC in November 2008, the Consumer Federation of America, Center for Audit Quality, Council of Institutional Investors, Investment Management Association, and CFA Institute

state that “investors require an accounting standard that reports a relevant and useful value of financial instruments regardless of the direction of markets. Fair-value accounting with robust disclosures provides more reliable, timely, and comparable information than amounts that would be reported under other alternative accounting approaches.” But of course, these groups also have a stake in the discussion, which likely biases their views as well.

It is also curious that European banks seem more opposed to FVA than US banks. If indeed litigation and enforcement risks give rise to significant implementation problems for FVA, it is surprising that the opposition to FVA is much stronger in Europe. Litigation risks and legal enforcement are much weaker in Europe. However, there is empirical evidence that European firms are generally less likely to take impairments and appear to smooth their earnings more ([Ball et al., 2000](#); [Leuz, Nanda, & Wysocki, 2003](#)). This evidence tells an alternative story and is more consistent with the flexibility-based explanation of most banks' long-standing support of HCA.

Conclusion and suggestions for future research

The preceding sections illustrate that the debate about FVA is full of arguments that do not hold up to further scrutiny and need more economic analysis. Moreover, it is important to recognize that standard setters face tradeoffs, and in this regard FVA is no exception. One example is the tradeoff between relevance and reliability, which is at the heart of the debate of when to deviate from market prices in determining fair values. Another example is that FVA recognizes losses early thereby forcing banks to take appropriate measures early and making it more difficult to hide potential problems that only grow larger and would make crises more severe. But this benefit gives rise to another set of tradeoffs. First, FVA introduces volatility in the financial statement in “normal times” (when prompt action is not needed). Second, full FVA can give rise to contagion effects in times of crisis, which need to be addressed – be it in the accounting system or with prudential regulation. In our view, it may be better to design prudential regulation that accepts FVA as a starting point but sets explicit counter-cyclical capital requirements than to implicitly address the issue of financial stability in the accounting system by using historical costs. It is an illusion to believe that ignoring market prices or current information provides a foundation for a more solid banking system. But we admit that the tradeoff between transparency and financial stability as well as the interactions between accounting and prudential regulation needs further analysis (see also [Landsman, 2006](#)). In addition, we have several other suggestions for future research.

First and foremost, we need to make more progress on the question of whether FVA did in fact contribute to the financial crisis through contagion effects. At present, there is little research that would answer or even directly speak to this question. The SEC study mandated by Economic Stabilization Act of 2008 argues that FVA did not cause bank failures because the fraction of assets reported at fair value was small in most cases, and in those cases where the

fraction of fair-value assets was larger, the share price reflected even higher losses than were reported by the bank. While this argument and the accompanying evidence point to real losses as the source of bank failures, they do not provide convincing evidence that there was no contagion. The failure of some banks could have increased market illiquidity, which in turn may have spilled over to other banks via FVA. Moreover, it is tricky to use banks' share prices as evidence that FVA did not have any negative effects for banks with a large fraction of fair-value assets since the share price may already reflect the negative real effects of FVA (e.g., asset fire sales in illiquid market).

A first step towards making progress on the role of FVA in the crisis is to be more explicit about the mechanism of contagion. A simple reference to models that show contagion effects in pure mark-to-market settings is not sufficient to explain the role of FVA in practice. However, the main challenge in finding evidence on contagion effects related to or caused by FVA likely lies in isolating accounting effects and separating them from contagion effects due to correlated (real) risks. This is not a trivial exercise. One important step would be to show that prices were indeed distorted and deviated substantially from fundamental values, which is not an easy task either. Evidence on this issue is only just emerging (e.g., Coval, Jurek, & Stafford, 2009). Similarly, we do not have evidence that banks' write-downs on securities were indeed excessive relative to their fundamentals. Interestingly, banks have also not put forward such evidence even though they should have strong incentives to do. As we noted earlier, banks are not constrained by the accounting standards from providing additional disclosures about the fundamental values of their assets. But it is possible that litigation risks or concerns about investor rationality inhibit such disclosures.

This brings us to a second avenue for future research. Our analysis suggests that implementation problems and, in particular, litigation risks could have played a role for the performance of FVA standards and banks' reporting practices in the crisis. It would be interesting for future research to explore this possibility and to study the interactions between FVA and other important elements of the institutional framework (e.g., litigation system, SEC enforcement). Understanding these interactions and the role of FVA in the current crisis is also crucial for the decision of whether or not to expand the use of FVA to other assets and other areas of accounting.

Third, although most of the debate seems to be focused on the role of FVA in the crisis, it seems equally important to ask and study to what extent HCA (e.g., for loans) may have played a role. We already noted that HCA may have fed into the securitization boom. Moreover, there is evidence suggesting that banks' loan losses exceeded fair-value losses on securities (e.g., Citigroup, 2009; Merrill Lynch, 2008). It is conceivable that the opacity of banks' loan books and the lack of strict impairment rules have considerably contributed to the current crisis and investor uncertainty. Along similar lines, it would be worthwhile to analyze the role of off-balance sheet vehicles and retained positions in asset securitizations in the crisis. The disclosures for these positions are often difficult to understand and may have been insufficient (e.g., KPMG, 2008). Again,

it could be that the opacity of these positions played a larger role for the sharp market reactions than the write-downs per se. Put differently, the accounting aspect of the crisis could very well be a transparency problem, rather than an overreaction to fair-value information (see also Shadow Committee, 2008).

A related issue is the question of how investors respond to additional disclosures that firms provide in times of crisis. There are a few studies that examine firms' responses to transparency crises and their economic consequences (e.g., Leuz & Schrand, 2008). The current crisis provides an interesting setting to further explore these issues. An analysis of European banks' annual reports by KPMG (2008) suggests that, in 2007, banks increased their disclosures related to financial instruments, in part due to the beginning of the crisis. It would be interesting to study what determines disclosure (or non-disclosure), how investors reacted to these disclosures and whether there are signs that investors overreact to such disclosures.

Finally, it is important to recognize that accounting rules and changes in them are shaped by political processes (like any other regulation). The role of the political forces further complicates the analysis. For instance, it is possible that changing the accounting rules in a crisis as a result of political pressures leads to worse outcomes than sticking to a particular regime (e.g., Brunnermeier et al., 2009). In this regard, the intense lobbying and political interference with the standard setting process during the current crisis provide a fertile ground for further study.

In sum, the fair-value debate is far from over and much remains to be done.

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Did Fair-Value Accounting Contribute to the Financial Crisis?

Christian Laux and Christian Leuz

In its pure form, fair-value accounting involves reporting assets and liabilities on the balance sheet at fair value and recognizing changes in fair value as gains and losses in the income statement. When market prices are used to determine fair value, fair-value accounting is also called mark-to-market accounting. Some critics argue that fair-value accounting exacerbated the severity of the 2008 financial crisis. The main allegations are that fair-value accounting contributes to excessive leverage in boom periods and leads to excessive write-downs in busts. The write-downs due to falling market prices deplete bank capital and set off a downward spiral, as banks are forced to sell assets at “fire sale” prices, which in turn can lead to contagion as prices from asset fire sales of one bank become relevant for other banks. These arguments are often taken at face value, but evidence on problems created by fair-value accounting is rarely provided.

We discuss these arguments and examine descriptive and empirical evidence that sheds light on the role of fair-value accounting for U.S. banks in the crisis. While large losses can clearly cause problems for banks and other financial institutions, the relevant question for our article is whether reporting these losses under fair-value accounting created additional problems. Similarly, it is clear that determining fair values for illiquid assets in a crisis is very difficult, but did reporting fair values of illiquid assets make matters worse? Would the market have reacted differently if banks had not reported their losses or used a different set of accounting

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rules, for instance, historical-cost accounting? If not, it is difficult to argue that fair-value accounting per se contributed to the crisis. Furthermore, downward spirals can arise for many reasons. It is easy to confuse problems that stem from the (voluntary) use of market prices in private arrangements—such as collateral or margin requirements or value-at-risk calculations—with problems that result from the (required) use of market values in accounting. Thus, it is important to be specific about the links through which write-downs under fair-value accounting can create problems, be it through bank capital regulation, contracts, a fixation on accounting numbers by managers or investors, or effects of inefficient markets.¹

We begin our analysis by explaining in more detail how pure mark-to-market accounting can cause problems in a crisis. We then outline extant accounting rules for banks' key assets. The majority of bank holding companies' assets are not carried at fair value on the balance sheet. When fair-value accounting applies, the actual rules differ markedly from pure mark-to-market accounting. Extant rules allow banks to deviate from market prices under certain circumstances. Moreover, not all fair value changes enter the computation of banks' regulatory capital (regulatory capital is a bank's equity capital as defined by bank regulation). These provisions should act as safeguards, making downward spirals and contagion less likely to occur as compared to a regime of pure mark-to-market accounting.

After this background information on how fair-value accounting actually works, we examine possible mechanisms through which fair-value accounting could have contributed to the financial crisis. Did fair-value accounting contribute to the problems of investment funds that invested in mortgage-backed securities and thus contribute to the demise of financial institutions that issued those funds? Did fair-value accounting weaken bank holding companies or investment banks in other ways? Is there evidence that banks made use of the safeguards and discretion built into fair-value accounting rules and that they deviated from potentially distorted market prices or dealer quotes? Is there evidence that fair-value accounting led to excessive write-downs of assets?

Based on our analysis and an extensive review of the empirical evidence to date, it is unlikely that fair-value accounting contributed to the severity of the financial crisis in a major way, either by increasing banks' leverage in the boom or by substantially amplifying banks' problems in the downturn. That is, while downward spirals and asset fire sales did occur during the crisis, there is little evidence that these events occurred as a direct result of fair-value accounting or that the problems would have been less severe under historical-cost accounting. Banks were highly levered during the boom and relied heavily on collateralized repurchase agreements. But the amount of debt that can be obtained by collateralized borrowing depends on the

¹ For summaries of the pros and cons of fair-value accounting and further references, we refer readers to Landsman (2007), Penman (2007), Benston (2008), Ryan (2008), SEC (2008a), and Laux and Leuz (2009). For discussions of fair-value accounting and its procyclical effects, ECB (2004), Banque de France (2008), IMF (2008), and Panetta and Angelini et al. (2009) are useful starting points. For accounts arguing that fair-value accounting played a substantial role in deepening the financial crisis, see American Bankers Association (2008), Wallison (2008a, 2008b), Whalen (2008), and Forbes (2009). For accounts defending fair-value accounting during the crisis, see Ball (2008), Turner (2008), and Veron (2008).

market value of the assets used as collateral (not the book value set by accounting rules). Moreover, investors would have been concerned about banks with substantial (subprime) mortgage exposure once the problems in the mortgage market were apparent even if banks had not written down mortgage-related assets and simply reported their historical cost. Thus, investment funds, investment banks or bank holding companies that relied heavily on short-term borrowing and had substantial subprime exposures would have faced major difficulties regardless. In fact, less transparency about losses and exposures could have made matters worse.

For U.S. bank holding companies, the effect of fair-value changes on bank income and regulatory capital (in booms or busts) is much more limited than often claimed. Moreover, during the crisis, banks made ample use of the safeguards and discretion built into fair-value accounting. For instance, many banks with substantial real-estate exposure and large trading portfolios used cash-flow-based models to value their mortgage-related securities by the third or fourth quarter of 2007. The notion that marking to market pricing was widespread among U.S. banks is simply a myth as far as mortgage-related securities are concerned. Moreover, using various benchmarks, we find little evidence that banks' reported fair values suffered from excessive write-downs or undervaluation in 2008, which in turn could have contributed to downward spirals and contagion. If anything, the evidence points in the opposite direction—that is, towards overvaluation, particularly when banks have more discretion in determining fair value.

While the claim that fair-value accounting exacerbated the financial crisis appears to be largely unfounded, our analysis should be interpreted cautiously and not be viewed as advocating an extended use of fair values. It is possible that the role of fair-value accounting was limited precisely because its relevance for banks' balance sheets and capital requirements was limited. Moreover, there are tradeoffs: on one hand, marking assets to market prices can in principle exacerbate downward spirals and contagion during a financial crisis; but on the other hand, a faster recognition of losses provides pressures for prompt corrective action by banks and regulators and likely limits imprudent lending in the first place. We need more research and empirical evidence to guide reforms of the accounting rules and bank regulation.

How Pure Mark-to-Market Accounting Can Cause Problems in a Crisis

The most commonly suggested and most plausible mechanism through which fair-value accounting could contribute to a financial crisis involves the link between accounting and bank capital regulation. Market prices can deviate from their fundamental values for various reasons, be it a liquidity crunch or limits to arbitrage (Shleifer and Vishny, 1992, 1997). If a bank has to write down its assets to these distorted prices and, as a result, the bank's regulatory capital is depleted, the write-downs can force the bank to sell assets at fire sale prices and set off a downward spiral. Moreover, if fire-sale prices from a distressed bank become relevant marks for other banks, mark-to-market accounting can cause write-downs and regulatory

capital problems for otherwise sound banks (Cifuentes, Ferrucci, and Shin, 2005; Allen and Carletti, 2008; Heaton, Lucas, and McDonald, 2009).

Contagion problems can also arise when management is focused on (short-term) accounting numbers, in particular earnings (for example, because bonuses are based on earnings). In this case, management could be inclined to sell relatively illiquid assets at a price below the fundamental value to preempt the anticipated sales of other market participants (Plantin, Sapra, and Shin, 2008). In doing so, management avoids having to mark the asset to an even lower market price but creates contagion effects for other banks.

These arguments suggest potential problems with pure mark-to-market accounting. However, in practice, the accounting rules do not stipulate pure mark-to-market accounting. Thus, the interesting question is to what extent has fair-value accounting as applied in practice contributed to the problems in the financial crisis.

How Does Fair-Value Accounting Work in Practice?

Companies that are publicly traded on a U.S. stock exchange are required by the Securities and Exchange Commission (SEC) to prepare and file quarterly financial statements, which include a balance sheet and an income statement. Financial statements are prepared using “generally accepted accounting principles” (GAAP) and enforced by auditors, the SEC, and private securities litigation. The SEC has essentially delegated the task of establishing financial reporting standards to the privately run Financial Accounting Standards Board (FASB).²

Broadly speaking, the objective of “generally accepted accounting principles” is to facilitate financial transactions in markets and contracting in the economy. Financial statements provide standardized information to various parties who use it for investment and credit decisions, to monitor their claims, for private contracting, and regulatory purposes. It is therefore important that accounting numbers are relevant and reliable. However, what is relevant likely differs across users, and relevance and reliability can be in conflict—so that those who set accounting rules often face tradeoffs. Bank regulators typically start with banks’ financial statements according to GAAP when measuring bank capital and setting capital requirements. But they are not required to use capital according to GAAP, and in some cases they explicitly set up other rules.

The Concept of Fair Value in Accounting

The generally accepted accounting definition of “fair value” is based on rule FAS 157, which was issued by the Financial Accounting Standards Board in 2006. FAS 157 outlines a hierarchy of inputs to derive the fair value of an asset or lia-

² The FASB is set up as an independent foundation with 16 trustees. These trustees appoint five board members who are the FASB decision-making group; these members are required to sever all other employment ties while serving on the board. The board can draw on an advisory council, staff members, and comment letters from other groups. For details, see the FASB website at (<http://www.fasb.org/home>).

bility. Level 1 inputs are quoted prices (from transactions or dealers) in active markets for identical assets. If such prices are available from orderly transactions, they have to be used to determine fair value, which means the asset is “marked to market.” The rule explicitly states that an orderly transaction is not a forced liquidation or distress sale. If Level 1 inputs are not available, models are used to determine fair value, which is sometimes called “marking-to-model.” FAS 157 requires that these models use observable inputs (Level 2), which includes quoted prices for similar assets and other relevant market data (like interest rate yield curves or spreads between related interest rates). Level 3 inputs are unobservable inputs, typically model assumptions, and can be used if observable inputs are not available.

The concept of “fair value” predates the issuance of FAS 157 and many other U.S. accounting standards refer to “fair value” when measuring assets and liabilities. For this reason, even if the specific rules of FAS 157 were suspended, it would not end the practice of fair-value accounting.

Comparison with Historical Cost Accounting

The main alternative to fair-value accounting is “historical-cost accounting.” Here, assets are recorded at historical cost, which generally equals the fair value when the assets were originally purchased. Subsequently, historical costs are adjusted for amortization and impairments, but not for increases in asset values. Impairments have been a part of historical-cost accounting for decades and occur when the fair value of an asset falls below its amortized cost. When asset values *decline* and impairment is unrestricted, fair-value accounting and historical-cost accounting are conceptually the same. However, in practice, the impairment test differs across assets. Moreover, whether or not the book value of an impaired asset is written down and the loss is recognized in the income statement depends on the asset in question and, in many cases, on whether the impairment is deemed as “other than temporary.”

As long as Level 1 inputs—prices from active markets for the same asset—are available, fair-value accounting provides little room for manipulation and generally provides reliable information. To the extent that Level 2 inputs have to be used, fair-value accounting offers some discretion to management. With Level 3 inputs, management has considerable discretion. Historical-cost accounting offers little room for manipulation as long as original purchase prices or amortized costs are used, but this information is often criticized for not being relevant or timely. There is considerable discretion with respect to whether an asset is treated as impaired. Moreover, because historical-cost accounting does not recognize gains unless the asset is sold, it may provide incentives for banks to selectively sell (and repurchase) assets that trade in liquid markets and have appreciated in value.

Relevant Accounting Rules for Key Bank Assets

Accounting rules for financial instruments follow a “mixed-attribute” model, meaning that the accounting treatment differs depending on the type of asset and its intended use (as determined by the reporting entity’s management). To guide

Table 1

Key Assets on the Balance Sheets of U.S. Banks*(as a fraction of total assets for the years 2004 to 2006)*

	<i>Large bank holding companies</i>	<i>Smaller bank holding companies</i>		<i>Large investment banks</i>
Trading assets	12.22%	0.71%	Trading assets	33.34%
Net trading assets	6.71%	0.37%	Net trading assets	15.66%
Other securities	14.69%	20.67%	Collateralized agreements	39.54%
Available-for-sale	14.56%	17.79%	Receivables	12.15%
Held-to-maturity	0.13%	2.88%	Securities received as collateral	2.83%
Loans and leases	47.28%	61.67%	Securities segregated for regulatory and other purposes	3.99%
Repo agreements	10.04%	2.41%		
Financial instruments	87.83%	90.02%	Financial instruments	97.73%
Total Assets	100%	100%	Total Assets	100%

Note: The table reports (weighted) averages over the year-end amounts from 2004 to 2006 for various bank assets and for the total of financial instruments. Within each group and year, observations are weighted by total assets. Commercial bank numbers are from Federal Reserve Bank of Chicago bank holding company datasets. **Large bank holding companies** include banks with total assets greater than \$100 billion. This sample includes on average 27 banks. **Smaller bank holding companies** include banks with assets between \$1 billion and \$100 billion. This sample includes on average 412 banks. **Large investment banks** include Goldman Sachs, Morgan Stanley, Merrill Lynch, Lehman Brothers, and Bear Stearns. Their data are taken from 10-K SEC filings. For the bank holding companies, “Repo agreements” refer to federal funds sold and securities borrowed or purchased under agreements to resell. For the investment banks, “Collateralized agreements” refer to securities borrowed and securities purchased with agreements to resell. “Receivables” are from brokers, dealers, counterparties, customers and, in a few cases, consumer loans (for example, for Morgan Stanley). Among the investment banks, only Merrill Lynch had securities that were classified as available-for-sale or held-to-maturity (on average 8.30 and 0.09 percent of total assets, respectively).

our discussion of relevant accounting rules for banks’ assets, Table 1 provides (asset-weighted) averages for the key assets of U.S. banks (reported values as a fraction of total assets) for the years 2004 to 2006. We distinguish between large bank holding companies, smaller bank holding companies, and large investment banks (as they existed prior to the financial crisis). The subsequent discussion describes the categories of assets in the table along with the accounting rules that were in effect during the financial crisis.

“Loans and leases” are by far the most important asset class for bank holding companies and generally account for half or more of these banks’ total assets. They can be classified as either “held-for-investment” or “held-for-sale.” Held-for-sale loans and leases are carried at the lower of historical cost or fair value. In practice, the fraction of loans and leases in this category is typically very small.

For held-for-investment loans and leases, historical-cost accounting applies: they are carried at the principal amount outstanding adjusted for amortization (amortized cost) and are subject to impairment testing. A loan is impaired (according to FAS 114) if it is probable that a creditor will be unable to collect all amounts due. If impaired, the loan is written down to the present value of expected future

cash flows. In addition, following FAS 107, banks have to disclose a fair-value estimate for the loans in the notes to their financial statements.

Securities such as U.S. Treasury bills and bonds, obligations of other U.S. government agencies, asset-backed and “structured” securities, bonds, equities, and derivatives can be classified by management as “trading assets” or “other securities.”

According to FAS 115, “trading assets” are bought and held principally for the purpose of selling them in the near term. These marketable securities are reported at their fair value and fair-value changes are recognized in the income statement. Trading assets constitute a substantial fraction of the balance sheet for large investment banks (33 percent) and for large bank holding companies (12 percent), but are unimportant for smaller bank holding companies. Securities that are classified as trading assets by bank holding companies are usually held as part of their brokerage business, market-making, and proprietary trading.

For bank holding companies, “other securities” that are not held for trading and that are classified (under FAS 115) either as “held-to-maturity” or “available-for-sale” are a substantial part of the balance sheet. Available-for-sale securities are carried at fair value. Unrealized gains and losses arising from changes in fair value that are viewed as temporary are not recognized in the income statement but in a separate component of shareholders’ equity called “accumulated other comprehensive income.” However, if such changes are deemed “other than temporary,” then the asset has to be written-down to its fair value and the loss is recognized in the income statement.³

Investments in debt securities are classified as held-to-maturity if the bank has the intent and ability to hold the securities until they mature. Held-to-maturity securities are carried in the balance sheet at historical cost adjusted for amortization. They are subject to (other-than-temporary) impairment testing and banks have to disclose their aggregate fair value in the notes to the financial statements.

In addition, banks can report nontrading securities and certain financial instruments at fair value under the so-called “fair value option” introduced by FAS 159. Its objective is to reduce accounting mismatches and earnings volatility caused by measuring related assets and liabilities differently. Securities for which a bank elected the fair value option are treated like trading securities. However, the fraction of nontrading securities that banks reported under the fair value option is negligible in 2007 and 2008.

A large fraction of investment banks’ assets are “collateralized agreements” with brokers, dealers, clearing organizations, and counterparties. They consist of securities purchased under agreements to resell, and securities borrowed. Bank holding companies also have sizeable “repo agreements.” Given that these agreements are typically very short-term, these positions are recorded at amounts near

³In response to pressure from Congress and banks, the Financial Accounting Standards Board recently amended the rules for other-than-temporary impairments on debt securities. For fiscal years ending after June 15, 2009, other-than-temporary impairment shall be separated into the amount representing the credit loss and the amount related to all other factors. If the entity does not intend to sell and is unlikely to be required to do so, only the credit loss is recognized in the income statement.

fair value, even if technically they are often reported at historical cost (for example, Nissim and Penman, 2007; SEC, 2008a).

Thus, for large bank holding companies, about 36 percent of assets are reported at or close to fair value (primarily from the categories of trading assets, available-for-sale securities, and repo agreements); another 50 percent of total assets (primarily loans and held-to-maturity securities) are subject to fair value *disclosures* in the notes to the financial statements. For investment banks, the fraction of balance sheet assets recorded at fair value tends to be higher as they have large trading books and a substantial amount of collateralized agreements.

Among assets recorded at fair value, assets for which Level 2 inputs are used comprise the largest category (mostly models with observable inputs). Both Level 1 inputs (marking-to-market) and Level 3 inputs play a much smaller role. During the crisis, the fraction of assets with Level 1 inputs decreased, while those valued using models and unobservable inputs (Level 3) increased. Presumably, as the crisis unfolded, fewer assets were traded in active markets, requiring banks to use models to value their assets. We discuss this shift in more detail later.

Did Fair-Value Accounting Worsen the Crisis for Investment Banks?

Starting in 2007, declining house prices, defaults by subprime borrowers, foreclosures, cases of mortgage fraud, and rating downgrades created major problems for mortgage-related securities, in particular affecting complex, mortgage-based, “structured” instruments. As housing prices plummeted and mortgage default rates skyrocketed, the market for such securities dried up for reasons unrelated to accounting. There was vast uncertainty over how these securities should be valued, combined with considerable fear of information asymmetries about the quality of the underlying assets and banks’ exposures to these securities. Detailed discussions of these problems can be found in Ashcraft and Schuermann (2008), Cox (2008), Rajan, Seru, and Vig (2008), Hellwig (2009), and Gorton (forthcoming).

Many mortgage-related assets were held by investment funds—for example, hedge-funds and “special investment vehicles.” As the default risk increased after the onset of the crisis, these investment funds witnessed a huge outflow of capital in the middle of 2007. Several institutions that originated these investment funds, like Bear Stearns and BNP Paribas, stopped withdrawals and disallowed redemptions of their investment funds. They justified this move by arguing that it was impossible to value the assets in the funds as there were “just no prices” for some of the securities (Boyd, 2007). Their decision to stop withdrawals was probably also motivated by the fact that these funds had been financed largely with short-term debt and other redeemable funds, and with falling asset values, withdrawals by investors posed severe financial difficulties.

The originators of the investment funds responded to the funds’ problems by providing guarantees and secured loans to bail them out. However, by bailing out the investment funds, the institutions effectively assumed their risks and

assets. This strategy can be reasonable if the institution believes that the assets are underpriced, perhaps due to a market overreaction, and if the institution has the financial independence to hold on to the assets until the market recovers. In contrast, if the institution that originated the fund is also substantially financed with short-term capital and redeemable funds, it is likely to run into the same problems as investment funds. As even sophisticated players in these markets for structured products, like investment banks and rating agencies, continuously revised their valuations and ratings downward (for example, Benmelech and Dlugosz, 2009), anxiety among investors increased. For example, after rating downgrades, two hedge funds run by Bear Stearns had problems meeting margin calls and on June 22, 2007, Bear Stearns committed \$3.2 billion in secured loans (Brunnermeier, 2009). Only one month later, Bear Stearns revealed that both funds had lost nearly all their value and the funds filed for bankruptcy. In addition to concerns about the fundamentals, investors were worried that banks and the fund managers might misrepresent information to save their funds (Gasparino, 2007). For example, Barclays Bank filed a lawsuit, claiming that they were systematically misled by Bear Stearns about the value of the assets in the funds (Clark, 2007).

Prominent examples of institutions with substantial subprime exposure, either directly or indirectly via investment funds, are Bear Stearns, Merrill Lynch, and Lehman Brothers. Might fair-value accounting have played a role in the demise of these investment banks? All three institutions experienced bank runs by other large and sophisticated financial institutions and struggled with increased collateral requirements (Morris and Shin, 2008; Brunnermeier, 2009; Gorton and Metrick, 2009). The investment banks tried to sell assets and raise new capital, but in the end were unable to survive.

It seems implausible that a different accounting regime would have helped or saved these investment banks. For investment funds, the need to regularly determine current or “fair” values for their assets is not an accounting issue; it is necessary because they are financed with redeemable capital and short-term debt. Given the business model of investment banks and their reliance on short-term debt financing, the issue is not much different. Outside investors would have been concerned about the value of the funds’ and investment banks’ assets even if the assets had been recorded at historical cost. Thus, it is unlikely that write-downs or fair-value accounting per se played a significant role for the demise of investment funds or investment banks.

Simply revealing severe losses cannot be the issue. The complaint about fair-value accounting would have to be that it forced the investment banks to report losses that were unrealistically large and driven by the short-term uncertainty and lack of liquidity in the market. However, anecdotal evidence suggests that the asset values reported on the three investment banks’ balance sheets were too *high* relative to what the banks could sell the assets for, which in turn did not help to build confidence and may have made matters worse. For example, Merrill Lynch sold \$30.6 billion of collateralized debt obligations backed by mortgages for 22 cents on the dollar, resulting in a pretax loss of \$4.4 billion (Keoun and

Harper, 2008). The loss indicates that, at the time of the sale, the book value of the assets was 65 percent higher than the exit price in the market. Similarly, the hedge fund manager David Einhorn, who sold Lehman's shares short, criticized Lehman for overstating the value of their assets as they wrote-down only 3 percent of its \$39 billion commercial mortgage-backed securities portfolio when an index of commercial mortgage-backed bonds fell 10 percent in the first quarter of 2008 (Onaran, 2008).

One might also argue that fair-value accounting played a role in the decision of financial institutions to bail out their investment funds. Allegedly, financial institutions feared that selling the investment funds' assets into an illiquid market would have depressed prices and forced write-downs on assets held by their other investment funds or by themselves. This fear of a contagion effect may have played a role in the decision, but we doubt that this was a first-order effect for investment banks. For them, concerns about their reputation if one of their funds was to fail, as well as fear of further withdrawals of funds, were probably also of great importance. More generally, the financial difficulties of investment banks during the crisis seem to be the result of poor investments, short-term debt financing, high leverage, and investors' concern about the value of the underlying assets, rather than aggressive write-downs forced by fair-value accounting.

Finally, it is also unlikely that fair-value accounting fuelled the high leverage prior to the crisis. Adrian and Shin (2009) find a strong positive association between leverage and total assets for investment banks and suggest that this effect is largely driven by short-term collateralized borrowing such as repurchase agreements. Collateralized agreements play an important role for investment banks but less so for bank holding companies, which may explain why Adrian and Shin do not find that leverage increases with total assets for commercial banks. Also, the level of debt that can be obtained by collateralized borrowing depends on the market value of the assets used as collateral (not their book value) and on the "haircuts" demanded in the marketplace. Increasing haircuts in a downturn are sufficient to produce procyclical leverage (Morris and Shin, 2008).

Did Fair-Value Accounting Worsen the Crisis for Bank Holding Companies?

According to the American Bankers Association (2009), fair-value accounting is "appropriate for assets that are held for trading purposes or if an entity's business model is based and managed on fair value." However, for traditional commercial banks and for loans, leases, and securities that are held to maturity, the argument goes, fair-value accounting can be inappropriate and misleading, especially in a time of crisis and when markets are illiquid.

However, as we pointed out earlier, banks that focus on traditional lending business can largely avoid the effects of fair-value accounting on their balance sheet or income statement by classifying their loans as held-for-investment. Similarly, for held-to-maturity securities, fair-value accounting is not required. Indeed, for the

31 bank holding companies that failed and were seized by U.S. bank regulators between January 2007 and July 2009, loans accounted for roughly three-quarters of their balance sheets, and trading assets essentially played no role.⁴

Furthermore, we are not convinced by the argument that fair value should not be relevant for assets that are held with a long-term perspective. First, even for assets that will be held to maturity, investors might want to assess a bank's exposure to certain risks or might have some doubts that the bank can hold these assets to maturity. This argument does not require the recognition of fair values in the balance sheet, but it suggests that disclosure of fair values in the notes of financial reports is useful. Second, current market values—and not the historical costs—are important when a bank has to roll over short-term funds or raise new capital.⁵ It is unlikely that banks themselves would accept the argument from a borrower negotiating a new mortgage that the current price of a house is not relevant because it is temporarily depressed! Third, bank regulators likely also care about the fair value of a bank's loan portfolio because it provides an estimate of expected future loan losses.

Although deriving fair values is very complex in illiquid markets and in times of crisis, it is conceptually difficult to argue that the disclosure of fair-value information per se contributed to uncertainty and exacerbated the financial crisis. Given the known problems in the housing and subprime lending markets, it is unlikely that investors would have not been concerned about bank holding companies had they not disclosed fair-value information. Instead, it is more plausible that less information would have increased investor uncertainty and concerns about adverse selection. In principle, disclosure of fair-value information should mitigate these problems. Moreover, disclosure of fair-value information makes it more difficult for banks to downplay potential problems and hence should act as an early warning system and as a trigger for corrective actions. That is, even if banks' shareholders would have been calmer in the absence of fair-value disclosure, which seems unlikely, there is the concern that, in this case, banks might have had incentives to continue their excessive subprime lending.

Thus, to make a convincing case that fair-value accounting contributed to the severity of the crisis, it is necessary to go beyond information effects and look for actions that were taken *because* fair-value accounting affected a bank holding company's balance sheet, income statement, or regulatory capital. In this regard, it is important to recall that, for bank holding companies, the income statement and regulatory capital are already shielded from many fair-value changes.

The biggest position on bank balance sheets, the held-for-investment loan portfolio, is not subject to fair-value accounting on either the balance sheet or income statement and it is subject to weaker impairment standards. In the second

⁴ Based on 2006 bank regulatory filings using a list of failed banks posted by the Federal Deposit Insurance Corporation. For a similar finding and conclusion, see SEC (2008a).

⁵ The current market value and the liquidity of an asset also play an important role when determining or adjusting margin or collateral requirements. Collateral and margin calls can trigger a downward spiral: that is, increased collateral or margin requirements and falling prices can reinforce each other (Shleifer and Vishny, 1992; Brunnermeier and Pedersen, 2009). However, this spiral is not related to the accounting system; it results from the use of market values in bilateral contracts.

biggest category, available-for-sale securities, fair-value accounting plays a limited role: fair-value changes are recognized only in “other comprehensive income,” but not in the income statement, unless the asset is sold or other than temporarily impaired. Moreover, fair value changes of available-for-sale debt securities do not affect a bank’s regulatory capital unless the asset is sold or is other than temporarily impaired. If the bank has the intent and ability to retain the asset for a period of time sufficient to allow for a recovery of the market prices, then it can treat the losses as temporary and thereby avoid the effect of fair-value losses of available-for-sale debt securities on its income and regulatory capital.

Indeed, during the crisis, many banks initially argued that the uncertainty related to mortgage-backed and other securities was temporary and that they had the intent and ability to retain the securities for a sufficient period of time to allow for a recovery in the market (Krumwiede, Scadding, and Stevens, 2008). For example, Citigroup did not recognize “other than temporary” losses on available-for-sale and held-to-maturity securities until the fourth quarter of 2008 and even then the amount of the recognized losses was small (\$2.8 billion) compared to the unrealized losses on these securities of \$19 billion (Citigroup, Form 10-K, 2008, pp. 151 and 158).⁶

Thus, even for the largest position recorded at fair value—that is, available-for-sale securities—the income statement and regulatory capital were shielded from fair-value changes in precisely those cases for which banks argued during the crisis that fair-value accounting was not appropriate and should be suspended: when a decline in market prices, a decrease in liquidity, or an increase in the risk premium is deemed temporary (or an overreaction) and when the bank has the intent and ability to hold on to the asset.

The only remaining position with a direct impact on net income and regulatory capital is the trading book. Here, even the American Bankers Association argues that fair-value accounting is appropriate. Moreover, there are only few very large bank holding companies that have substantial trading portfolios, which they usually hold as part of their investment banking activities. But we nevertheless take a closer look at this link, because these trading portfolios caused huge losses for some of these banks. Of particular importance are JP Morgan and Citigroup with net trading assets exceeding 19 percent and 16 percent of total assets, respectively. Citigroup suffered a trading loss of more than \$26 billion in 2008, which equals 19 percent of their total regulatory (Tier 1 and Tier 2) capital at the beginning of 2008. While the four largest bank holding companies, including Citigroup, remained “well capitalized” according to their Tier 1 and total regulatory capital ratios throughout the crisis, we nevertheless ask in the remainder of the paper whether large write-downs on trading assets and marking to distorted market prices for such assets may have contributed to downward spirals and lead to contagion effects.

⁶ This role of other-than-temporary impairments in shielding banks’ income statements and regulatory capital from losses also explains the increasing pressure on the FASB in early 2009 to ease both impairment and fair-value rules before banks needed to issue their first quarter financial reports. By that time, it became increasingly difficult for banks to keep up the argument that losses on securities were only temporary.

Before we turn to this issue, we also note that it is unlikely that fair-value accounting played an important role in increasing bank holding companies' leverage during the boom.⁷ As explained above, the effect of fair-value accounting on regulatory capital was very limited for most banks. But even for banks with large trading portfolios, historical cost accounting alone would not pose a constraint in the boom. If a bank wanted to increase its leverage due to rising market values but could not do so because of the restriction to writing up assets under historical cost accounting, it could simply realize the market value gains by selling and then repurchasing the securities. Moreover, if the capital constraint is not yet binding, it could lever up by repurchase agreements pledging the assets as collateral, in which case the market value, and not the book value, matters.

Is There Evidence That Market Prices Were Distorted?

An important question for the debate is to what extent market prices were indeed distorted during the crisis. Although deviations from fundamentals are clearly possible (see also the discussion by Krishnamurthy in this issue), the occurrence and magnitude of distortions are often difficult to determine. For example, the Bank of England's Financial Stability Report in April 2008 estimated that ABX indices, which provide price benchmarks for securities backed by home equity loans, overstate losses by over 20 percent relative to loss estimates based on projected delinquency rates and other credit risk fundamentals. However, ABX indices continued to fall and by October 2009 were still trading considerably below what they had been trading at the time of the April 2008 Bank of England report, even though the crisis is now widely viewed as contained and equity market prices have risen by more than 30 percent from their lows. Thus, it is not obvious that ABX prices in April 2008 considerably overestimated expected credit losses on securities backed by home equity loans, although we acknowledge concerns about ABX pricing during the crisis (Gorton, forthcoming). For instance, Fender and Scheicher (2008) find that increased risk aversion and market illiquidity played a role in the decline of ABX prices. But these factors are also relevant for fundamental values. Similarly, large bid-ask spreads are often cited as evidence for market distortions and then used to criticize fair-value accounting because fair value is defined as an exit (or bid) price. However, it is important to ask why the spread is large. If, for example, the bid-ask spread of an asset-backed security reflects that bank managers are unwilling to sell because they

⁷ Amel-Zadeh and Meeks (2009) redo the leverage analysis of Adrian and Shin (2009) for a longer time period and do not find evidence that the association between leverage growth and asset growth became stronger with the widespread introduction of fair-value accounting in the mid 1990s. In contrast, Khan (2009) finds contagion effects in banks' equity returns occur more frequently in periods with higher use of fair-value accounting. However, as the use of fair value has been steadily increasing over time, the results could also reflect increasing trends in other factors that can cause contagion, such as more transactions with margin requirements or more ratings-based structured products. More research along these lines is necessary to settle this issue.

are gambling for resurrection (Diamond and Rajan, 2009), the bid price can still be close to the fundamental value and hence be appropriate.

Systematic empirical analyses of potential market distortions during the crisis are just emerging. Coval, Jurek, and Stafford (2009) examine the pricing of investment-grade credit risk during the crisis (using cash bond spreads and credit derivative spreads). They conclude that the repricing of credit risk appears consistent with the decline in the equity market, an increase in its volatility, and a better pricing of the risks embedded in structured products. They find little evidence suggesting that the dramatic widening of the credit spreads during the crisis was driven by fire sales; if anything, the changes in credit spreads appear to have corrected mispricing that occurred prior to the crisis.⁸ Similarly, Longstaff and Myers (2009) find that bank equity prices and equity tranches from collateralized debt obligations were priced consistently between 2004 and 2009. While both studies cast doubt on the notion that prices in the credit markets were systematically distorted, both studies perform their analyses relative to the pricing in the equity markets. Thus, it is possible that both equity and credit markets were mispriced. More research is necessary to settle this issue.

Safeguards and Circuit-Breakers in Fair-Value Accounting Standards

Given that distortions of market prices are possible, it is important to recognize that even for trading assets, U.S. accounting rules do not require strict marking to market prices under all circumstances. Fair-value accounting as stipulated by U.S. accounting rules (including FAS 157) has several safeguards against marking to potentially distorted market prices (including dealer quotes) and hence against accounting-induced downward spirals and contagion.

First, FAS 157 explicitly states that prices from a forced liquidation or distress sale should not be used in determining fair value. Thus, if fire sales occur, banks should not mark their assets to these prices, which amounts to a “circuit breaker” in a downward spiral. In practice, it can of course be difficult to identify prices that stem from fire sales—but the rule gives banks a legitimate reason to discard extreme prices.

Second, banks choose how to classify their securities at the outset (under FAS 115). This classification determines which assets are in banks’ trading books and gives them some built-in discretion over the extent to which fair value changes affect net income and regulatory capital. Furthermore, in rare circumstances, banks can reclassify and transfer financial instruments from one category to another. For example, in the fourth quarter of 2008, Citigroup reclassified debt securities with a carrying value of approximately \$60 billion to held-to-maturity; in this way, Citigroup was able to limit the negative effect of further declines in

⁸ Friewald, Jankowitschy, and Subrahmanyam (2009) find that liquidity measures explain market-wide corporate yield spread changes even after accounting for credit risk, suggesting that liquidity does play a role in the pricing. But as noted above, liquidity can be a factor in pricing fundamentals.

fair value on net income or shareholders' equity. However, the interpretation of circumstances that justify a reclassification is quite strict. Indeed, it is often argued that the SEC did not permit reclassifications until the third quarter of 2008 and hence well into the crisis.⁹ Another issue is that when banks have transferred assets to the held-to-maturity category, they are not allowed to sell these securities or reclassify them again. We are not aware of any other major U.S. bank holding company using reclassifications.

Third, when markets become inactive and transaction prices are no longer available, banks are not forced to use dealer quotes that are distorted by illiquidity. In such cases, FAS 157 explicitly allows banks to use valuation models to derive fair values. As the financial crisis deepened, banks used this option. Of all the assets reported at fair value in the first quarter of 2007, bank holding companies used Level 1 inputs (quoted prices) for 34 percent of them; by the first quarter of 2009, this fraction decreased to 19 percent, as shown in Table 2. For bank holding companies, most of the decline in Level 1 assets appears to be compensated by an increase in Level 2 assets, although Level 3 assets also increase from about 9 to 13 percent. For investment banks, Level 3 assets increase from 7 to 14 percent, mirroring a decline in Level 1 assets from 27 to 22 percent, while Level 2 assets remain almost constant.

As the changes over quarters are also affected by sales and purchases, we also examine net transfers into the Level 3 category, which have to be reported separately. We find that net transfers into the Level 3 category were substantial, but more importantly, they took place early in the crisis. From the first quarter of 2007 to the first quarter of 2008, the cumulative net transfers into Level 3 relative to the original balance of Level 3 assets amounts to over 40 percent for investment banks and to over 80 percent for the bank holding companies. The numbers are even more striking for those banks that were hit the most during the crisis. For Bear Stearns, Lehman, and Merrill Lynch, the cumulative Level 3 transfers by the first quarter of 2008 amount to over 70 percent of the pre-crisis balance, and Citigroup transferred \$53 billion into Level 3 from the third quarter 2007 to the first quarter of 2008 alone.

While this evidence clearly shows that banks were able to use unobservable inputs and models in determining fair values, even early in the crisis, it is difficult to assess whether they used them enough to avoid contagion effects. The rules are quite restrictive as to when it is possible to deviate from observable market prices. For instance, SEC (2008b) and FASB (2008) emphasize that, while managers can use models and unobservable inputs, they cannot ignore (information contained in) market prices or dealer quotes, and they also stress that illiquid markets are not necessarily a reason to deviate from prices or quotes. The fundamental difficulty here is that managers have an information advantage over auditors and regulators, which in turn makes it difficult to write and enforce accounting standards that both provide flexibility when it is needed but also constrain managers' behavior where flexibility can be used opportunistically. As a result of this trade-off, accounting

⁹ For example, see "Accounting rules only fair" at (<http://www.worldfinance.com/news/corporate-practices/financialregulation>) *World Finance*. December, 12, 2008.

Table 2

Assets Measured at Fair Value (FV) under FAS 157 over Time for a Constant Sample of Major U.S. Banks

	Major investment banks (<i>n</i> = 3)					Major bank holding companies (<i>n</i> = 4)				
	FV/ total assets	L1/FV	L2/FV	L3/FV	Net transfers	FV/ total assets	L1/FV	L2/FV	L3/FV	Net transfers
2007 Q1	44.9%	27.4%	65.6%	7.0%	NA	32.4%	33.5%	57.2%	9.2%	NA
2007 Q2	43.2%	26.5%	65.5%	8.0%	0.13%	33.6%	36.4%	55.0%	8.6%	0.15%
2007 Q3	46.7%	26.1%	64.2%	9.7%	1.27%	32.2%	30.1%	58.9%	11.0%	0.76%
2007 Q4	48.0%	25.5%	64.6%	10.2%	-0.04%	32.0%	29.3%	59.6%	11.1%	1.46%
2008 Q1	49.6%	23.3%	65.9%	10.9%	0.84%	32.4%	27.2%	60.7%	12.1%	1.99%
2008 Q2	48.5%	23.4%	65.9%	10.7%	-0.54%	33.3%	26.7%	59.0%	14.3%	1.38%
2008 Q3	49.6%	23.6%	65.6%	10.8%	0.27%	31.0%	26.2%	57.7%	14.6%	1.48%
2008 Q4	51.8%	15.5%	70.2%	14.3%	0.90%	29.9%	18.7%	68.2%	13.2%	-0.67%
2009 Q1	55.2%	22.1%	64.0%	13.9%	-2.43%	31.6%	19.3%	67.4%	13.4%	1.30%
Cumulative L3 transfers	2008 Q1: 43.12%		2008 Q4: 53.58%			2008 Q1: 82.90%		2008 Q4: 131.23%		

Note: The table is based on banks' 10-K and 10-Q filings and provides information on assets measured at fair value on a recurring basis (in accordance with FAS 157). The sample comprises major investment banks (IB) and bank holding companies (BHC) that adopted FAS 157 at the start of fiscal year 2007 and is limited to those that continued to exist through the fourth quarter of 2008. The IB sample consists of Goldman Sachs, Morgan Stanley, and Merrill Lynch (but only Goldman Sachs and Morgan Stanley in Q1 2009). The BHC sample consists of JP Morgan, Bank of America, Citigroup, and Wells Fargo. We report simple averages over the banks in the respective sample. We do not subtract liabilities reported at fair value, but all assets are reported after netting of derivatives and hedges. The netting adjustment is generally not available by category and hence is allocated proportionally to Level 1, Level 2, and Level 3 assets. (See text for definition of Level 1, 2, and 3 assets.) Quarterly **Net transfers** are reported as a percentage of previous quarter Level 1 and Level 2 assets. **Cumulative L3 transfers** is the sum of transfers into Level 3 from Q1 2007 to the denoted quarter, divided by the Level 3 assets measured in Q1 2007. In 2009, Goldman Sachs and Morgan Stanley shifted their fiscal-year-end date from November 30 to December 31. As a result, "Cumulative L3 transfers" from Q1 2007 to Q4 2008 include one additional month for these two banks compared to the BHC. On Apr. 1, 2007, Bank of America moved U.S. government and agency mortgage-backed debt security (almost all of them available-for-sale securities) from Level 1 to Level 2. For comparability across time, we adjust the percentages in Q1 2007, subtracting Bank of America's Level 1 available-for-sale securities from L1 and adding them to L2. This adjustment is a reasonable approximation for the fraction of reclassified assets as Bank of America holds only a small fraction (< 1 percent in Q2) of available-for-sale securities in L1 after the new policy. Without this adjustment, the average fraction of Level 1 (Level 2) assets for the BHC reported in the table above would be 43.4 percent (47.3 percent).

standards that at times may be overly restrictive are the price that must be paid for rules that require timely write-offs when assets are impaired (Laux and Leuz, 2009).

Thus, it is possible that the rules as well as SEC and FASB guidance were too restrictive and that the economy would have benefited in 2008 from giving managers more flexibility during the crisis.¹⁰ Perhaps consistent with this view, the FASB

¹⁰Wallison (2008a) and others have viewed the SEC (2008b) guidance on fair-value accounting issued in March 2008 as having exacerbated the problem. A report by Goldman Sachs (2008) issued at the time illustrates the uncertainty surrounding the SEC guidance in March, but the report concludes

clarified and relaxed the condition for moving assets into Level 3 in April 2009. But this move was largely the result of political pressure. Joint FASB/SEC guidance issued in September 2008 and the FASB Staff Position (FAS 157-3) issued back in October 2008 had already stated that adjustments to observable inputs and market prices may be necessary and should be considered.

More importantly, the notes to banks' financial statements reveal that mortgage-related assets, which were at the heart of the financial crisis, are rarely Level 1 assets. At the beginning of the crisis, banks typically reported them as Level 2 or Level 3 assets, and many moved them to Level 3 early in the crisis. For instance, Citigroup moved to an "intrinsic cash-flow methodology" to value their mortgage-related securities by the fourth quarter of 2007. JP Morgan reports in the fourth quarter of 2008 that "the majority of collateralized mortgage and debt obligations, high-yield debt securities and asset-backed securities are currently classified in Level 3." Thus, the "problem assets" of this crisis were largely marked to models, and the notion of directly marking to market prices is a myth as far as mortgage-related securities are concerned.

Empirical Studies on Banks' Financial Reporting and Evidence on Excessive Write-Downs

Our analysis up to this point indicates that banks had considerable discretion in determining the fair value of their securities. This discretion should have enabled them to avoid marking to distorted Level 1 inputs—be it market prices or dealer quotes—for example, by instead marking to cash-flow models. But widespread use of models alone would not be enough if banks were still forced to mark down Level 2 and Level 3 assets excessively—say, by using high market discount rates for fear of litigation or because of strict auditing. We therefore ask whether the evidence suggests that reported fair values were too low and banks' write-downs excessive. Empirical evidence that speaks to this question is just beginning to emerge in the academic literature.

Goh, Ng, and Yong (2009), Kolev (2009), and Song, Thomas, and Yi (2009) analyze the market pricing of banks' fair-value assets as implied by their share prices relative to other assets and across fair-value input categories. While the point estimates differ across studies (due to different samples and specifications), there is little evidence that market valuations of the fair-value assets in 2008 exceeded their reported values, which might indicate excessive write-downs.¹¹ More importantly, all three studies find that investors priced a *reported* \$1 of Level 3 assets significantly

that the SEC did not tighten the standards or their implementation. However, the uncertainty about the intention of the guidance (coupled with litigation concerns) may have been enough to deter some preparers from deviating from market prices.

¹¹ As an example, assume that a bank can hold an asset until maturity with a positive probability but fair-value accounting requires the bank to mark the asset to a price that is distorted by asset fire sales or a high liquidity discount. In this case, the market should value the asset above the bank's reported value, reflecting the positive probability that the bank will not have to sell at the distorted price and may realize a higher value in the future.

below a *reported* \$1 of Level 1 assets. The discount relative to Level 1 assets ranges between 20 and 30 percent. Furthermore, the three studies show that the relative discount of Level 3 assets is smaller when the reported values are likely to be more credible, that is, for firms using Big Four auditors, external valuations, having several financial experts on the audit committee, and for firms with independent board members and strong internal controls. The relative discount of Level 3 assets also increases for banks with less regulatory capital (Goh, Ng, and Yong, 2009).

There are several possible explanations for these findings. One explanation is that banks' valuations based on unobservable Level 3 inputs are upwardly biased and overstate the value of these assets. But the discount can also be driven by factors that enter market pricing but not banks' fair-value estimates. For instance, it is possible that investors apply larger discount factors to the reported Level 3 fair values because they stem from valuation models with unobservable inputs and hence are subject to more model risk (or noise) and larger information asymmetry. The lower market pricing of Level 3 assets could also reflect an expectation that, because these assets are very illiquid (compared to Level 1 assets), they would have to be sold at deep discounts if banks had to engage in asset fire sales. While investors would be expected to price such an expectation, under the existing accounting rules, banks' are not required to use fire-sale prices in calculating fair values. Thus, it is possible that the reported values are not overstated relative to the rules, but do not reflect the fire-sale or illiquidity discounts priced in the market.

The three aforementioned studies cannot distinguish between these explanations.¹² However, even if expected fire sales explain the discount of Level 3 assets, the results imply that banks were able to report fair values well above the (expected) fire-sale prices of these assets and that the discount exists nevertheless, which casts doubt that the reported fair values played a role in creating the fire-sale expectation in the first place.

To distinguish between explanations, it would be interesting to look at how the market pricing of reported fair values changed in the fourth quarter of 2008 as banks received government guarantees and other forms of support that made fire sales less likely. If the discount of Level 3 assets in the first three quarters of 2008 declined in subsequent quarters, this would point towards the fire-sale explanation. If in turn the discount relative to Level 1 assets remained or even increased, the fire-sale explanation is unlikely. Existing studies do not yet provide this analysis for the market pricing of fair-value assets.

However, it is possible to examine banks' market-to-book ratios instead. A bank's (net) book value equals the value of its assets net of its liabilities as reported in the balance sheet; hence, the market-to-book ratio is an indication of the market pricing of reported net assets. This approach clearly has limitations, but it may provide a first indication. Table 3 reports market-to-book ratios from the first quarter of 2007 to

¹² In addition, it is possible that the results reflect unobserved differences in bank strategies or business models that are correlated with banks' fair-value allocations across levels. Alleviating this concern for time-invariant differences, Goh, Ng, and Yong (2009) find similar results in changes and Gartenberg and Serafeim (2009) provide corroborating evidence based on abnormal returns in the fourth quarter of 2008.

the first quarter of 2009 for a sample of seven major U.S. investment banks and bank holding companies. Prior to the crisis, market-to-book ratios are on average around two for both types of banks. Throughout the crisis, market-to-book ratios fall and by the fourth quarter of 2008, the ratios are below one. In the first quarter of 2009, the market-to-book ratios are below 0.9 for the two remaining investment banks and below 0.5 for the bank holding companies. Thus, although banks' franchise values are generally positive and not recorded on the balance sheet, investors appear to value banks' assets substantially below their reported book value. As before, it is possible that share prices reflect an expectation of distressed sales of banks' assets (for example, to satisfy capital requirements). However, as Table 3 shows, banks' market-to-book ratios continue to fall in the fourth quarter of 2008 and the first quarter of 2009.¹³ The government interventions in October 2008 should have reduced the likelihood of distressed sales of banks' assets into illiquid markets and hence increased the relative pricing if it primarily reflected such fire-sale discounts. While this evidence is only suggestive and hinges on our belief as to whether banks' share prices during the crisis were reasonably efficient, it points more in the direction of overvaluation of banks' assets than towards the fire-sale explanation.

In a similar spirit, Huizinga and Laeven (2009) analyze the market pricing of banks' real-estate assets, that is, mortgages and mortgage-backed securities. They find that, in 2008, investors discount the reported values of banks' real-estate loans by over 15 percent and of mortgage-backed securities by about 13 percent. These discounts remain large and statistically significant in the fourth quarter of 2008. Moreover, they show that banks with a larger share of mortgage-backed securities have smaller loan loss provisions, particularly when their valuations are low. Cumulatively, these findings show that banks exercise substantial discretion in valuing their assets and cast doubt on claims that banks were forced to write-down their mortgage-related assets excessively.

More evidence on banks' reluctance to recognize losses comes from a goodwill impairment study by Disclosure Insight (2009), an independent investment research firm. When a bank acquires another bank, the acquiring bank has to record the premium it paid over the fair value of the acquired bank's assets and liabilities as "goodwill" on its balance sheets. This goodwill is regularly tested for impairment and needs to be written down if the fair value of goodwill is below its book value. The study shows that, of the 50 U.S. banks that made substantial acquisitions prior to the financial crisis, 35 banks have not written down their goodwill positions at all, despite the fact that banks' market values have declined precipitously in the crisis. For instance, Bank of America carries over \$80 billion in goodwill on its 2008 balance sheet, which amounts to 50 percent of its shareholders' equity and largely stems from the acquisitions of FleetBoston Financial, MBNA, and LaSalle Bank between 2004 and 2007. Until the second quarter of 2009, Bank of America had not

¹³ It is conceivable that this decline in market-to-book ratios based on common shareholders' equity reflects a wealth transfer from common shareholders to the government, when the government required banks to take on preferred shares as part of the government bailout. But this explanation is unlikely given the findings in Veronesi and Zingales (2009).

Table 3
Market-to-Book Ratios for Common Shareholders' Equity over Time

	<i>Major U.S. investment banks</i>		<i>Largest U.S. bank holding companies</i>	
	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>
2007 Q1	2.24	2.26	2.08	2.00
2007 Q2	2.26	2.31	1.96	1.90
2007 Q3	2.08	1.95	1.90	1.82
2007 Q4	1.92	1.86	1.55	1.35
2008 Q1	1.53	1.50	1.42	1.25
2008 Q2	1.39	1.29	1.06	0.88
2008 Q3	1.08	1.24	1.08*	1.12*
2008 Q4	0.94	0.73	0.90	0.66
2009 Q1	0.86	0.86	0.45	0.43

Note: The table reports market-to-book ratios for banks' common shareholders' equity from the first quarter of 2007 to the first quarter of 2009. The sample contains three major investment banks (Goldman Sachs, Morgan Stanley, and Merrill Lynch; except for the first quarter of 2009 when Merrill Lynch was already part of Bank of America) and the four largest bank holding companies (Bank of America, Citigroup, JP Morgan, and Wells Fargo). The ratios are computed as the total market value of outstanding common shares at the fiscal quarter end divided by the contemporaneous total book value of common shareholders' equity.

* In the third quarter of 2008, the market value of Wells Fargo stock included the pending takeover of Wachovia. We adjusted the book value of Wells Fargo accordingly by adding the book value of Wachovia Bank.

recorded any goodwill impairment. The Disclosure Insight (2009) study provides 15 other examples of banks with "questionable" goodwill treatment. Ramanna and Watts (2009) provide similar evidence on firms' reluctance to impair goodwill based on a broader sample.

Our final piece of evidence on banks' reluctance to report losses is based on fair-value disclosures for loans. For loans, we can compare loan losses implied by bank reporting with external estimates of loan losses. This comparison does not rely on market prices, and hence the result cannot be explained by distorted market prices. According to FAS 107, banks have to disclose the fair value of their financial instruments, even if these instruments are carried on the balance sheet at amortized costs. Thus, for loans, we can compute the difference between the value at amortized costs (net of the allowance for loan losses) and the fair value. This difference plus the allowance for loan losses can be viewed as the *reported* estimate of expected loan losses.¹⁴ This estimate should in principle be an upper bound on

¹⁴ The allowance for loan losses by itself is an insufficient estimate of the expected future loan losses because, as described earlier, it is *not* based on a comparison of the fair value with the carrying value

expected loan losses if fair-value accounting forces banks to use exit values that are substantially below fundamental values, as is often claimed. We can then compare this reported estimate of expected loan losses with estimates by external parties.

We use external loan loss estimates for the four largest U.S. bank holding companies from four different reports that were released shortly after banks released their 2008 financial statements (Board of Governors, 2009; Citigroup, 2009; Citadel, 2009; Goldman Sachs, 2009). The first estimate is from the Supervisory Capital Assessment Program (SCAP)—the regulatory program to evaluate whether financial institutions had enough capital, known as the “stress test.” The second estimate is from a Citigroup analyst report predicting loan losses over the next few years. The remaining two loss estimates by Citadel and Goldman Sachs analysts are computed by multiplying the projected loss rates for each loan category by the loans held in that category.

Table 4 shows that banks’ reported estimates of the expected loan losses—as implied by the difference between the loans’ amortized cost (column A) and their fair value (column B), plus the loan loss allowance (column C)—are much smaller than the respective loss estimates by external parties for all four banks. The lowest external estimate for each bank exceeds the reported estimate by over 45 percent (Wells Fargo) up to 76 percent (Bank of America), and some external estimates exceed the implied loss estimate reported by the banks by a factor of three. One potential criticism of this comparison is that several of the external estimates are based on or at least influenced by the assumptions used for the regulatory “stress tests,” which were meant to be conservative. However, the “adverse scenario” of the stress tests looked increasingly likely by April 2009. Moreover, the Goldman Sachs estimates (last column) stem from January 2009 and predate the announcement of the stress tests. In unreported tests, we come to similar conclusions when we gauge banks’ reported loss estimates against concurrent analyst forecasts for loan charge-offs over the next three years or against loan loss estimates in the IMF Stability Report from April 2009.

In sum, there is little evidence that banks’ reported fair values suffer from excessive write-downs or undervaluation in 2008. If anything, the evidence points in the opposite direction, suggesting that banks used the discretion in the accounting rules to keep asset values high relative to concurrent market prices and expectations. More research is needed to determine whether these findings indeed imply that banks are overstating their assets.

Conclusion

Many have called for a suspension or substantial reform of fair-value accounting because it is perceived to have contributed to the severity of the 2008 financial crisis. This criticism and the ensuing political interference by the European Commission

of the loans. In addition, there is empirical evidence that banks manage their allowance for loan losses and that banks’ loan loss provisions in times of distress tend to be too small. See, for example, Beatty, Chamberlain, and Magliolo (1995), Liu and Ryan (1995), Ahmed, Takeda, and Thomas (1999), and Laeven and Majnoni (2003).

Table 4

Loan Loss Estimates Implied by Reported Fair Values versus External Estimates
(in billions of dollars)

	Loans held		Reported loss expectation		Estimated loan losses			
	Amortized cost (A)	Fair value (B)	Allowance for loan and lease losses (C)	Total implied loss (A - B) + C	SCAP prediction	Citigroup report	Citadel report	Goldman Sachs report
Bank of America	866.2	841.6	23.1	47.7	104.1	83.8	148.4	93.4
Citigroup	660.9	642.7	29.6	47.8	79.4	NA	102.6	71.0
JP Morgan	721.7	700.0	23.2	44.8	79.3	111.9	113.6	73.6
Wells Fargo	849.6	835.5	21.1	35.1	74.3	51.5	124.9	77.3

Note: The table reports in column A, the amortized cost (net of the allowance for loan and lease losses); in column B, the fair value of the loan portfolio reported in the notes as required by FAS 107; and in column C, the allowance for loan and lease losses. All figures are from the 2008 10-K filings and the sample comprises the four largest bank holding companies. The total implied loss is the amortized cost minus the fair value, plus the allowance for loan and lease losses, or $(A - B) + C$. This figure slightly overestimates the reported loss expectation on loans as the allowance also includes leases. FAS 107 fair-value disclosures and the external estimates in the other columns pertain only to loans. SCAP predictions are bank-specific loss estimates in 2009 and 2010 on the 2008 year-end portfolio in the “more adverse” scenario for first lien mortgages, second/junior lien mortgages, commercial and industrial loans, commercial real estate loans, credit card loans, and other consumer and non-consumer loans (excluding securities, trading, and counterparty risks). The Citigroup analyst report predicts loan losses over four years on the portfolio held at end of 2007. We adjust the four-year estimates by subtracting the estimated losses for 2008. (Subtracting only the amounts that banks actually charged-off in 2008 would result in even higher loss estimates compared to what we report in the table.) We use the reports by Citadel and Goldman Sachs to predict bank-specific losses by multiplying the projected loss rates for each loan category by the loans held in that category, as reported in the FR Y-9C filing in the fourth quarter of 2008. Citadel provides a range for their loss rates and we use the *lower* bound. Citadel and Goldman Sachs figures cover between 80 and 95 percent of banks’ entire loan portfolio, including real estate, consumer, and commercial & industrial loans. Note that external estimates typically predict losses only over the next two to three years whereas the total implied loss based on reported fair values should reflect losses over the life of the current loan portfolio and hence in principle be larger.

and U.S. Congress have put considerable pressure on the accounting standard setters to relax the rules.

Based on our analysis and the evidence in the literature, we have little reason to believe that fair-value accounting contributed to U.S. banks’ problems in the financial crisis in a major way. Fair values play only a limited role for banks’ income statements and regulatory capital ratios except for a few banks with large trading positions. For these banks, investors would have worried about exposures to sub-prime mortgages and made their own judgments even in the absence of fair-value disclosures. Moreover, extant rules have various safeguards and offer substantial discretion to banks, which allows them to avoid marking to distorted market prices. We show that banks used this flexibility during the crisis. At present, there is also

little evidence that prices were severely distorted due to fire sales of assets or that banks were forced to take excessive write-downs during the crisis.

In sum, we believe that the claim that fair-value accounting exacerbated the crisis is largely unfounded. This implies that the case for loosening the existing fair-value accounting rules is weak (see also SEC, 2008a). Nevertheless, our conclusions have to be interpreted cautiously and should not be construed as advocating an extension of fair-value accounting. We need more research to understand the effects of fair-value accounting in booms and busts to guide efforts to reform the rules. One issue is that fair-value accounting loses many of its desirable properties when prices from active markets are no longer available and hence models have to be used, which in turn makes it very difficult to determine and verify fair values. Thus, it is certainly possible that fair-value accounting rules and the details of their implementation could be further improved. However, standard setters face many thorny tradeoffs, several of which we discuss in greater detail in Laux and Leuz (2009).

First, relaxing the rules or giving management more flexibility to avoid potential problems of fair-value accounting in times of crisis also opens the door for manipulation and can decrease the reliability of the accounting information at a critical time. One reading of the empirical evidence on bank accounting during the crisis is that investors believed that banks used accounting discretion to overstate the value of their assets substantially. The resulting lack of transparency about banks' solvency could be a bigger problem in crises than potential contagion effects from a stricter implementation of fair-value accounting.

Second, even if (stricter) fair-value accounting were to contribute to downward spirals and contagion, these negative effects in times of crisis have to be weighed against the positive effects of timely loss recognition. When banks are forced to write down the value of assets as losses occur, they have incentives to take prompt corrective action and to limit imprudent lending in the first place, which ultimately reduces the severity of a crisis. A central lesson of the U.S. savings and loan crisis is that when regulators hold back from requiring financial institutions to confront their losses, the losses can rapidly become much larger. For the same reason, it is problematic if accounting rules are relaxed or suspended whenever a financial crisis arises because banks can reasonably anticipate such changes, which diminishes their incentives to minimize risks in the first place. If the goal is to dampen procyclicality, it may be more appropriate to loosen regulatory capital constraints in a crisis than to modify the accounting standards, as the latter could hurt transparency and market discipline.

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