Abstract

I review new empirical evidence to address the relation between the role of accounting for financial instruments and financial stability. I draw the following conclusions. First, there is still no evidence for widespread asset fire sales or contagion that were caused by fair value accounting in the financial crisis. Second, the empirical evidence so far suggests that accounting and regulation might have contributed to the crisis by allowing several banks to delay actions. Third, share prices reacted positively to the relaxation of fair value accounting rules in the crisis, but the reason may be that current rules allowed banks to run into financial and regulatory problems, not that fair value accounting and regulation was too strict. Fourth, fair values can be important for assets that a bank intends to hold until maturity if the bank strongly relies on short term financing, including interbank lending, repurchase agreements, and wholesale deposits that are not protected by government guarantees. Fifth, the recognition of fair values is no substitute for the disclosure of information. In particular, when fair values are based on models, disclosures should allow investors to judge the validity of the reported fair values.
1. Introduction

There is an ongoing debate about the role of accounting and capital regulation in the financial crisis of 2007-2009 and its implications for financial reporting and prudential regulation. In particular, fair value accounting has been blamed for causing contagion and fuelling the financial crisis.\footnote{For a discussion of the arguments and early evidence, including further references, see Landsman (2007), Penman (2007), Benston (2008), Ryan (2008), SEC (2008), and Laux and Leuz (2009, 2010).} In the present paper I analyze new evidence to address the relation between the role of accounting for financial instruments and financial stability. From this evidence, I draw the following conclusions:

First, there is still no evidence for widespread asset fire sales or contagion that were caused by fair value accounting in the financial crisis. Instead, distortions in the mortgage market, incurred loan losses, complex structured products, increases in haircuts and margin-calls, the reliance on short-term financing, including interbank financing, unsecured demand deposits, collateralized borrowing, and asymmetric information were main culprits in the crisis.

Second, the empirical evidence so far suggests that accounting and regulation might have contributed to the crisis by allowing several banks to delay actions rather than forcing them to act early. The focus of attention here is the treatment of available for sale debt securities in many countries, where full fair value accounting did not apply: unrealized losses did not affect earnings and regulatory capital until they were other then temporarily impaired. Banks were able to delay other than temporary impairments until the middle of 2008, but even by that time many securities with very high unrealized losses were still considered to be temporarily impaired. Instead of selling non-agency mortgage backed securities, banks increased their holding of these assets from the middle of 2007 to the middle of 2008.

Third, share prices reacted positively to the relaxation of fair value accounting rules in the crisis. There is currently no strong evidence on whether the benefits stems from a wealth transfer (from taxpayers and debt holders to shareholders) or an efficiency gain. But even if the latter is true, it is not possible to conclude that less fair value accounting is optimal. On the contrary, the opposite conclusion may be correct if it forces banks to take early actions, thereby avoiding running into a debt-overhang problem.
Fourth, fair values can be very important for loans and securities that a bank intends to hold until maturity for the collection of cash flows. This is the case if the bank strongly relies on short term financing, including interbank lending, repurchase agreements, and wholesale deposits that are not protected by government guarantees. Uncertainty and illiquidity in the market as reflected in fair values will then also affect a bank’s financing and whether the bank will be able to hold the securities until maturity.

Fifth, fair values based on models are subject to manipulation. But so are impairments used with historical cost accounting, in particular when management has to report the expected loss. Fair values based on models should be accompanied by disclosures that ideally allow investors to judge the validity of the reported fair values and assess a bank’s exposure. The recognition of fair values is no substitute for the disclosure of information.

2. Financial assets and financial reporting

Fair value accounting and historical cost accounting

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. If assets are traded in liquid markets for which market prices are available from orderly transactions (Level 1 inputs), these market prices have to be used as the measurement for fair value. When Level 1 inputs are not available, models are used to determine fair value. Models have to use observable inputs (Level 2), which include quoted prices for similar assets and other relevant market data. If observable inputs are not available, unobservable inputs including model assumptions have to be used (Level 3).

In contrast, with historical cost accounting assets are recorded at historical cost. When assets are initially purchased, the historical cost usually equals the fair value. Subsequently, historical costs are not adjusted for increases in asset values, but only for decreases due to amortizations and impairments. Impairment tests differ across assets and the level to which the book value of an asset is written down and the magnitude of the loss that is recognized in the income statement depend on the asset in question. If may vary from recognizing only incurred losses (incurred loss model) to losses equal to the difference between the historical cost and the market value of the asset if the market value falls below the historical host (lower of cost and market value).
Accounting rules for banks’ key assets

In this subsection I provide a very short and crude overview over the general rules applied to financial instruments of U.S. and European bank holding companies and commercial banks. (See, for example, Laux and Leuz, 2010, for a more detailed discussion of the relevant rules and an overview over the types of financial assets that U.S. banks held on their balance sheet.) It is important to observe that the accounting rules for financial instruments follow a “mixed-attribute” model where elements of fair value accounting and historical cost accounting are applied. For the purpose of the present paper, it is not necessary to distinguish between differences in IFRS and U.S. GAAP. I will focus on the rules in place at the beginning of the crisis and address important changes to the accounting rules during the crisis where they become relevant.

The first important observation is that fair-value accounting in its pure form only applies to assets that financial institutions hold in their trading portfolio. Thus, it is only relevant for very large bank holding companies and commercial banks with large proprietary trading or investment banking activities (as well as investment banks). Assets held for trading are generally assets that are traded in liquid markets for which market prices are available from orderly transactions.

Second, loans that banks hold (for investment or collection of cash flow rights) are valued at historical cost: they are carried at the principal amount outstanding adjusted for amortization (amortized cost) and are subject to impairment testing. For example, according to FAS 114, a loan is impaired if it is probable that a creditor will be unable to collect all amounts due. In this case, the loan is written down to the present value of expected future cash flows. For most banks, loans are the most important asset class.

Third, other securities that are not held for trading can be classified either as “held-to-maturity” or “available-for-sale”. Available-for-sale (AFS) securities are a substantial part of the balance sheet of many bank holding companies and commercial banks. 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.
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 (HTM) securities are carried in the balance sheet at historical cost adjusted for amortization and written down to their fair value if they are other-then-temporarily impaired.

In addition, banks can report non-trading securities and certain financial instruments at fair value under the so-called “fair value option”. 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 non-trading securities that banks reported under the fair value option is generally very small.

3. Financial reporting and financial stability

Procyclicality

There is a huge debate about the procyclicality of fair value accounting. Almost always, connotations are negative and explicitly or implicitly, less procyclicality is considered to be better. However, it is economically reasonable for banks to reduce lending in a downturn. The issue is whether accounting contributes to excessive swings; i.e., excessively high lending in the boom and excessive contraction in a recession. Theoretical models show that full fair value accounting can cause procyclicality (see, in particular, Allen and Carletti, 2008, and Plantin et al., 2008).

Interestingly, the Financial Stability Forum (2009) criticizes the impairment rules applied to loans for being procyclical, arguing that “earlier recognition of loan losses could have potentially reduced procyclicality in the current crisis.” (p. 20) They recommend that standard setters should consider alternative approaches to the incurred loss model for recognizing and measuring loan losses, in particular, an expected loss model or fair value.

It is important to understand how and to what extent current accounting rules contributed to the problems in the financial crisis. A main link through which accounting can contribute to procyclicality is its effect on regulatory capital.
Financial reporting and regulatory capital

Although financial reporting is the basis for regulatory capital requirements, it is a myth that there is a direct and unavoidable link between the two. Thus, even if the association between financial reporting and regulatory capital requirements caused problems, the conclusion that the remedy should be addressed through adjusting accounting standards is not reasonable. Indeed, in principle, regulators could require one set of accounting rules for financial reporting and another for regulation. For example, in Germany, banks were required to use IFRS for financial reporting but allowed to use HGB (Local GAAP) for regulatory purposes for a transitory period.

But even where regulatory capital is based on U.S. GAAP or IFRS, regulators deviate from financial reporting to determine regulatory capital ratios. First, the criteria for consolidating off balance sheet assets and liabilities for regulatory purposes can differ from the criteria used for financial reporting purposes. Second, the measurement of assets and liabilities for regulatory purposes can differ from the measurement in the financial statement. For example, for the purpose of calculating the Tier 1 and Total capital ratio of banks, risk weighted assets are used, where the weights are determined by regulators. In the following, I will focus on the determinants of regulatory capital.

Irrespective of whether the bank chooses to report its liabilities at fair value or not, unrealized gains due to an increase in own credit risk do not increase regulatory capital. Available for sales securities are reported at fair value. However, in many countries, changes in the value of AFS debt securities only affect regulatory capital measures if they are sold or other than temporarily impaired (OTTI). The reason put forward was that regulators did not find (temporary) unrealized losses of available for sale debt securities to be relevant for regulatory purposes if banks can hold on to the security. (I will come back to this point.) Not so in Germany, where prior to the crisis, unrealized losses of AFS debt securities reduced regulatory capital. As a principle of prudence, Local GAAP (HGB) required that current assets are valued at lower of cost or market price, which also affected regulatory capital before the introduction of IFRS.

In contrast to unrealized losses of AFS debt securities, unrealized losses of AFS equity securities do reduce Tier 1 capital in most countries. However, as in the case of AFS debt securities for Germany, it is more appropriate to interpret this as an impairment rule rather than fair value accounting. For example, in the US, the measurement of marketable equity securities at
the lower of cost or market value for reporting and capital regulation predates the introduction of FAS 115 in 1993.

In many countries, banks’ unrealized gains on AFS equity securities net of a haircut can increase supplementary (Tier 2) capital. For example, in the US, banks can include up to 45 percent of pretax net unrealized holding gains on AFS equity securities in Tier 2 capital. However, if they do so, they also have to add these unrealized gains in the calculation of risk-weighted assets. Thus, the Tier 1 capital ratio may decrease when unrealized gains of AFS equity securities are included in supplementary regulatory capital. The leverage ratio is not affected. It is again interesting to note that the possibility to include unrealized gains on AFS equity securities did not automatically follow the introduction of fair value accounting through FAS 115 in 1993. Instead, US regulators (the Office of the Comptroller of the Currency, the Federal Reserve Board, the Federal Deposit Insurance Corporation, and the Office of Thrift Supervision) introduced the possibility in 1998, following the proposal by the Basel Accord.

The crucial point is that the set of rules used to determine regulatory capital are enacted by regulators. Regulators use financial statements as the basis for determining regulatory capital, but important adjustments are made. In principle, regulators could require banks to report regulatory capital based purely on amortized costs (or fair values). It is not necessary to demand adjustments of financial reporting to change the way regulatory capital is derived. Any such demands may be misleading and potentially made to pursue other (self-serving) objectives.

However, this does not imply that accounting is irrelevant for capital regulation. Instead, it is important to understand how financial reporting in general and financial reporting for regulatory purposes (i.e., after the regulatory adjustments discussed above) contributed to the crisis. This understanding can then guide the improvement of financial reporting and regulation.


In principle, when default risk increases, banks should react by either increasing capital to bear the risk or, if the increase in risk involves liquid securities, sell the securities. Doing nothing and waiting can be detrimental for banks since they run into the risk of a debt-overhang problem, at which point raising external funds can be excessively difficult and an economically health bank may run into financial distress. But banks have a tendency to use too much debt
because of implicit and explicit government guarantees. Countervailing this incentive is a central motivation underlying financial regulation.

The effect of fair value accounting on regulatory capital

Several financial institutions with very large trading portfolios had to recognize huge losses in the crisis. But for trading assets, the principle that unrealized losses should be recognized is broadly accepted, and comparable impairment rules were applied in many countries prior to the introduction of fair value accounting (“lower of cost and market price”). Therefore, I do not debate the role of fair value accounting for trading assets in the crisis. But I will return to this issue when I talk about whether fair value accounting fed into the crisis by allowing banks to lever up in the boom.

Much of the debate on the role of accounting in the crisis focuses on AFS securities given the effect of OTTI charges on banks’ regulatory capital. Badertscher et al. (2012) collect quarterly OTTI charges on AFS and HTM securities from 2004 to 2008 for 100 U.S. bank holding companies with the highest level of non-Treasury AFS and HTM securities at the beginning of each quarter. They find that OTTI charges are generally very low until the third quarter of 2007 but reach $1 billion in the fourth quarter of 2007; in 2008, total OTTI charges jump to about $18 billion, with the last two quarters alone accounting for $14 billion. Thus, banks were able to delay any effect of price decreases of AFS and HTM securities on their regulatory capital until well into the crisis in the second half of 2008.

OTTI charges were small compared to these banks’ bad debt expenses, which have the same effect on earnings and regulatory capital as OTTI charges. Bad debt expenses increased from $10 billion in the first quarter of 2007 to nearly $30 billion in the fourth quarter of 2007 and totaled $170 billion in 2008 (Badertscher et al., 2012). Against this background, it seems odd to identify the OTTI charges as a main culprit of the banks’ mounting problems. However, OTTI probably received considerable attention because of the huge increase during the crisis compared to previous years. In the sample of Badertscher et al. (2012), the mean bad debt expenses increased by a factor of 4 in the crisis-period, compared to the pre-crisis period. In contrast, the mean OTTI increased by a factor of 20. This huge increase might be one reason why OTTI charges were perceived to be excessive in the crisis. But once securities are OTTI, they have to be written
down to their fair value. Expected losses of mortgage backed securities were probably higher than the expected losses for loans because of a selection bias in the securitization of the original loans. Moreover, in addition to the expected loses, fair values are negatively affected by illiquidity in the market, increased risk premiums, and flight for quality in the crisis.

Badertscher et al. (2012) show that the effect of OTTI charges on banks’ Tier 1 capital ratios in the 3rd quarter of 2008 was low. But unrealized fair value losses were high so that further OTTI charges were to be expected in the future. The expectation of large future OTTI charges may have affected banks already early on in the crisis. In particular, it may have adversely affected banks’ decision to hold MBS securities and caused a downward spiral.

Asset (fire) sales

Badertscher et al. (2012) find that industry-level sales did not increase during the crisis period compared to the pre-crisis period. Sales are positively related to OTTI charges in the crisis period. But the motive underlying the sale may not be the direct effect of OTTI on earnings or regulatory capital since sales are not related to earnings (excluding OTTI and bad debt expenses) and positively related to bad debt expenses only in 2008 but not in 2007. Moreover, sales are negatively related to changes in the change of the regulatory capital ratio during the crisis, but positively related to the absolute regulatory capital ratio in the pre-crisis and crisis period. Sales in the crisis period resulted in positive net realized gains that are higher than the gains from sale in late 2005 and 2006, and the cross-sectional variation in selling increases in the crisis, i.e., securities selling becomes less inter-related. Overall, the study does not find evidence that accounting rules induced systemic selling at low prices in the crisis. Instead, the evidence is consistent with bank idiosyncratic characteristics such as, e.g., liquidity needs, becoming more important in the crisis.

From the middle of 2007 to the middle of 2009 there was a dramatic fall in the prices of mortgage backed securities, the ABX Index, and the Case-Shiller U.S. Home price index. Procyclical accounting suggests that banks systematically sell these assets to protect earning and

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2 Adding OTTI charges back to Tier 1 capital increases the mean (median) Tier 1 capital ratio from 10.5 to 10.8 percent (from 9.9 to 10 percent).
regulatory capital from future price decreases. However, at the beginning of the crisis in 2007 the opposite effect can be observed. Badertscher et al. (2012) and Bhat et al. (2011) find that the average holdings of non-agency MBS increased sharply from the middle of 2007 until the middle of 2008.

Bhat et al. (2011) analyze the relation between sales of non-agency MBS and liquidity in the MBS market before and after the relaxation of FAIR VALUE rules at the beginning of 2009 in the U.S. Banks with a high fraction of non-agency MBS relative to total assets, a low total capital ratio, and a high level of non-performing loans sold non-agency MBS in response to illiquidity in the MBS market before the relaxation of fair value rules. The empirical relation no longer exists after the relaxation of fair value accounting. However, as Bhat et al. (2011) point out, it is not likely that sales had a significant impact on non-agency MBS prices since banks owned only about 11% of non-agency MBS during the sample period and sales even before the change in accounting rules were low.

The argument that Fair Value Accounting and OTTI charges caused (foreseeable) problems for banks is also not reflected in the dividend policy. Shaffer (2010) analyzes the impact of changes in the fair values of AFS and HTM securities and the impact of dividends paid on common stock on the Tier 1 Capital of the 14 largest U.S. bank holding companies at the end of 2008. With the exception of Bank of NY Mellon, the dividend effect exceeded the effect of fair value changes of AFS and HTM securities on Tier 1 capital. For example, for JPMorgan Chase the fair value impact was -0.1% compared to a dividend effect of -4.8%; for Citigroup and Bank of America, the numbers are -2.6% compared to -5.5% and -3.9% compared to -9.1%, respectively. By that time, the banks were already recapitalized. Without the recapitalization the impact of fair value accounting would have been larger, but so would have been the impact of dividends.

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3 The liquidity component in the ABX index is measured as the residual of a regression of the monthly ABX index return on the monthly Case/Shiller Home Price Index return, the residential REIT index return, and the yield change in Treasury bonds.

4 In April 2009, in response to pressure from the U.S. Congress and banks, the FASB eased fair value rules. First, it emphasized that fair value measurements reflect values from orderly transactions and made it easier to deviate from market prices when the market is illiquid. Second, for fiscal years ending after June 15, 2009, only the credit related loss of an other than temporary impaired AFS debt security is recognized in the income statement if the entity does not intend to sell the security and is unlikely to be required to do so.
Use of depressed market prices for financial reporting

Although there is no evidence for widespread asset fire sales by banks, it is still possible that banks were forced to write down assets to inefficiently low market prices in an illiquid market. Unfortunately, the question to what extent this was the case is very difficult to answer since it is difficult to identify valuation distortions.

In inactive markets, banks can use valuation models to derive fair values. As the financial crisis deepened, banks used this option. Laux and Leuz (2010) find that net transfers into the Level 3 category were substantial and took place early in the crisis. For example, 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. 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. 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.

Shortcomings of disclosure and incentives to hide losses

But the possibility to deviate from, e.g., dealer quotes in inactive markets to use models, is not without costs. Both opponents and proponents of FVA criticize models as not being reliable. As noted in Laux and Leuz (2010), anecdotal evidence suggests that market participants feared that the investment banks were downplaying their losses and exposure. Disclosure and transparency was key concern in the crisis. (See also, Freixas and Laux, 2011.)
Investor reactions in the crisis
- Reaction to reported asset values and evidence of manipulation

Kolev (2009) and Song et al. (2010) 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. Both studies find that investors priced a reported $1 of Level 3 assets significantly below a reported $1 of Level 1 assets. The discount relative to Level 1 assets ranges between 20 and 30 percent and is lower for firms with strong corporate governance.

One explanation for the difference in valuations is that investors fear that the reported values based on unobservable Level 3 inputs are upwardly biased. But the discount can also stem from factors that affect the value of the assets held by the banks, 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 are subject to more model risk (or noise) and larger information asymmetry and because they are less liquid than Level 1 assets. Level 3 valuations might not capture these valuation aspects. But investors might still think that they are relevant if they affect the banks’ refinancing and probability of future asset-fire sales.

Even if it is difficult to distinguish between manipulation and other factors affecting the value of assets held by banks that are not captured by Level 3 valuations, there are two interesting conclusions. First, investors do not use accounting information naively, but distinguish between different valuation models underlying the reported asset values. Moreover, as Goh et al. (2011) show, more disclosure helps to reduce uncertainty associated with Level 3 assets. Second, the findings suggest that Level 3 assets were valued above the values that investors attribute these assets.

In a similar spirit, Huizinga and Laeven (2009) analyze the market pricing of banks’ real-estate assets, i.e., 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.
- **Use of alternative measures of capital**

  In 2008, investors started to focus on banks’ tangible common equity (TCE) ratio to measure banks’ health (e.g., Shaffer, 2010). There are different definitions of the TCE ratio, but they all have in common, that unrealized losses of AFS debt securities are not excluded. It is conceivable that investors no longer trusted regulatory capital ratios and one possible reason is that they felt that unrealized losses of AFS securities are important for estimating a bank’s health. The very fact that investors started to look for other measures of equity and capital ratios in the crisis shows that they do not use accounting information naively and in a static way. Instead, they react to changes in the fundamentals and are ready to look for other measures than those provided by regulators or accounting standard setters. Regulators and standard setters have limited means to manipulate the information that investors demand and how they use it.

- **Reactions to relaxation of fair value accounting rules**

  There is some evidence that shareholders reacted positively to the relaxation of fair value accounting rules in the crisis. Bowen et al. (2010) find a positive (negative) stock market reaction to key events suggesting that policymakers in the U.S. would (would not) relax fair value accounting and impairment rules during the financial crisis. Bhat et al. (2011) also find that the stock market responded positively to the relaxation of fair value accounting at the beginning of 2009. (See footnote 3.) The authors also look at the reaction of bond prices and find no evidence that the positive stock price reaction was driven by a redistribution of wealth form bondholders to shareholders due to the relaxation of fair value accounting rules.

  Bischof et al. (2011) analyze the stock market reaction to the IASB amendment that granted banks the option to reclassify certain assets so as to avoid fair value accounting. The option was used extensively and for a small group of banks with severe financial difficulties and the highest probability of regulatory intervention, the announcement of the reclassification possibility is associated with abnormally positive stock returns. The reclassifications were to be accompanied by specific disclosure requirements, but two-thirds of the reclassifying banks in the sample do not comply with these requirements. Interestingly, Bischof et al. (2011) find that the bid-ask spread for these banks increases in the long run.

The evidence of the crisis suggests that banks did not react early by selling securities or recapitalizing. Instead most banks held on to the troubled assets and even increased their positions. Why didn’t the banks sell the troubled assets? Given the size of the MBS market any adverse consequences on prices of sales by an individual bank were likely small relative to the potential problems that these banks accepted by retaining these securities on their balance sheet. Of course, some managers may just have been optimistic and thought that prices are temporarily depressed. More importantly, banks have incentives to hold risky securities so that even pessimistic managers of highly levered institutions would have an incentive to hold on to non-agency MBS securities. (See also Diamond and Rajan, 2009, who discuss a related point.)

One conclusion that can be drawn from the empirical evidence is that this incentive was reinforced by accounting and regulation, shielding banks’ regulatory capital from unrealized losses of AFS and HTM debt securities. First, banks were not forced to take early actions. The very rules that can act as buffer against procyclicality allowed banks to hold on to securities for too long without raising additional capital. Second, as security prices decline, it becomes increasingly costly for banks to sell securities. When selling these securities at a loss, there is a direct negative effect on regulatory capital, which they can avoid by holding on to the assets (until the securities are other than temporarily impaired). Moreover, when banks sell AFS securities at a loss, auditors may question the bank’s ability and intend to hold the assets until prices recover and require OTTI charges on the banks’ other securities.5

When finally OTTI charges can no longer be avoided, banks have to take a big hit at a time when it is particularly difficult to raise additional funds. It might be better to have securities affect regulatory capital right away.6

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5 Similar arguments are made by Badertscher et al. (2012). Their empirical evidence is consistent with banks selling securities only after OTTI charges have been made.

6 A similar case can be observed for holdings of Greek government bonds, which by most European banks held as loans (which IFRS permits) at amortized cost and with zero weight in risk weighted capital. Banks did not sell Greek government bonds as a response to price declines. It is unlikely that they held on to the securities merely because they were asked to do so by their governments. Although, governments may object that sales would have triggered a downward spiral and increased problems. Possibly it would have been still positive as it would have made it more difficult for European governments to delay action.
A possible objection is that shareholders reacted positively to the relaxation of fair value accounting rules. Of course, these gains may come from regulatory arbitrage. But even if the relaxation of fair value accounting helped to overcome distortions caused by fair value accounting inefficiencies (for example, by reducing the expected cost of financial distress or government intervention), the evidence does not suggest that fair value accounting should generally be relaxed. Instead, the opposite conclusion may be more appropriate. In contrast to trading assets, full fair value accounting did not apply to AFS securities in most countries, where earnings and regulatory capital were shielded from mounting distortions in the market until the peak of the crisis. The problem might have been that the accounting and regulatory capital rules were lax to begin with and allowed delaying action and gambling, but then running into a debt overhang problem and in a danger of violating regulatory capital constraints. Immediate recognition of unrealized losses of the AFS debt securities in earnings and a corresponding reduction of regulatory capital may have helped by forcing banks to take early actions. Thus, the fundamental problem with accounting (and regulation) may not have been too much, but too little fair value accounting. But before a convincing case can be made for using more fair value accounting, several general objections have to be addressed.

5. Common objections against fair value accounting

Conservatism: “Fair value accounting allows to recognize unrealized gains and increases leverage, dividends, and, compensation in the boom just to increase problems in the bust”

An important objection is that fair value accounting violates the objective of conservatism by allowing banks to recognize unrealized gains with a direct effect on leverage, dividends, and compensation. For example, the Financial Services Authority (2009) argues that “it is a reasonable judgement that the application of fair value/mark-to-market accounting in trading books, played a significant role in driving the unsustainable upswing in credit security values.” (p. 65) Unfortunately, no further argument is provided as to how this would work with the exception of a remark that “a mark-to-market approach means that irrational exuberance in asset prices can feed through to high published profits and perhaps bonuses, encouraging more irrational exuberance in a self-reinforcing fashion.” (p. 65)
In many cases the market price is relevant irrespective of the accounting rule. For example, when a security is sold, the sales proceeds (and potential bonuses) are determined by the market price; when a security is purchased, it is initially recognized at its purchase price (fair value) even under historical cost accounting; for repos, the collateral value depends on the market value of the asset, not its book value, and low margin requirements in a boom will prevail even with historical cost accounting. Thus, irrational exuberance as well as model risk is relevant in these cases irrespective of the specific accounting rule.

It is important to distinguish the different links through which the use of fair values in a boom (i.e., the recognition of unrealized gains) can contribute to potential problems: Its effect on regulatory capital, managerial incentives, or investor overreaction to (or misunderstanding of) reported earnings.

For “credit security values” or asset backed securities, where problems of irrational exuberance and model risk might have been particularly severe, the potential for increasing prices (due to irrational believes about continuously decreasing default risk) was very low given the initial expectations, in particular, for highly rated securities. Instead, the irrational exuberance about ever growing home prices was reflected in the initial ratings and high prices that were paid on the initial sales. Indeed, at the end of 2006, i.e., before the crisis, the fair value of agency and non-Agency MBS held by banks in the sample of Bhat et al. (2011) was lower than the historical cost. The securities were predominantly held in AFS but even if they were held in trading, the fair values of these securities would not have relaxed regulatory capital or generated excess net income.

More generally, it is important to also consider the effect of trading liabilities and changes in the accounting rules on derivatives and other securities. The Committee of European Banking Supervisors (2006) conducted a study on the impact of the introduction of IAS/IFRS on banks’ balance sheet and regulatory capital at the transition from 2004 to 2005. The aggregate data covers 18 countries. Total trading assets increased by 74% (from Euro 976.5 billion to Euro 1,695.8 billion), total trading liabilities increased by 111% (from Euro 568.7 billion to Euro...
1,198.2 billion), and total net trading assets increased by 22%.\(^7\) Since 5 countries already apply IAS/IFRS or comparable standards, the effect of the transition for the other 13 countries will be underestimated. The effects can vary widely for different financial institutions.

Moreover, in a boom, banks generally hold capital in excess of regulatory capital requirements.\(^8\) This shows that the role of regulatory capital requirements for bank financing and ultimately leverage are less straightforward than often claimed. Banks might hold capital in excess of regulatory capital requirements to obtain a target rating that is required for their business model (i.e., wholesale investors and counterparties in derivatives may require more capital than the regulator). But banks hold capital as a buffer to satisfy regulatory capital requirements in a crisis. More cautious accounting may not have a strong effect as it is likely that managers take the accounting buffer in the bust into account when choosing their leverage ratio in the boom.\(^9\)

Adrian and Shin (2009) find a strong positive association between leverage and the total value of assets only for investment banks but not for commercial banks. They suggest that this effect is largely driven by the high relevance of short-term collateralized borrowing such as repurchase agreements. 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 can result in procyclical leverage (Morris and Shin, 2008, and Gorton, 2009).

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\(^7\) Of course, the introduction of IAS/IFRS did not only affect the reporting of trading securities and it might be interesting to briefly mention some other findings: AFS assets increased by 17%, held to maturity investments decreased by 64%. Total accounting equity decreased by 5%. Tier 1 capital decreased by 4% after the application of regulatory prudential filters. Without these filters, Tier 1 capital would have decreased by 12%. Total regulatory capital increased by 4% (2% without the regulatory prudential filters).

\(^8\) The Federal Deposit Insurance Corporation (FDIC) requires that the Tier 1 capital ratio must not fall below 4% of risk-weighted assets and considers a bank well capitalized if the ratio exceeds 6%. The banks in the sample of Badertscher et al. (2012) have a mean (median) Tier 1 capital ratio exceeded 11 percent (10.4%) in the pre-crisis period. Even a bank at the 25th percentile had a Tier 1 capital ratio of 9 percent and therefore 50 percent higher than what is needed to be considered well capitalized. (The FDIC also requires a minimum leverage ratio. Although, the leverage ratios of U.S. banks are often lower than the Tier 1 capital ratios, they are far from binding.)

\(^9\) It would be interesting to see, which banks have higher leverage (Tier 1 capital and leverage ratio), banks with different fraction of trading assets. However, the challenge is to isolate the effect of the differences in business models of banks with a different level of trading assets.
Relevance: “Fair value accounting is not appropriate for assets held for the collection of cash flows and causes excess volatility in earnings”

It is often argued that fair value accounting is not relevant for loans. But leaving valuation problem aside; in what sense is the fair value loans or securities held for the collection of cash flows not relevant?

For example, banks may argue that it is appropriate to distinguish between credit related and non-credit related losses and that non-credit related losses should not be recognized in earnings and should not affect regulatory capital for debt securities that the bank is able and willing to hold until maturity. Dividing fair value changes between those that are credit related and those that are not credit related provides management with considerable judgement and flexibility to report credit related losses. But in my view a bigger problem might be that the crucial part of the statement is that banks are “able to hold” the securities until maturity. It is a huge challenge to predict refinancing problems of banks. The presumption that banks that are considered to be well capitalized for regulatory purposes are also able to hold assets for the collection of cash flows has been challenged in the crisis. For banks that are financed short-term and with a high fraction of redeemable funds that are not protected by deposit insurance or other government guarantees, distortions in securities markets might be no less important if the bank holds on to the assets then when it sells them. Distorted prices may be irrelevant if banks can hold on to assets; but they may be very relevant for the question whether banks can hold on to assets. Even if a bank has no intention to sell securities individually, it still has to “sell them to investors” when raising new capital or trying to convince investors not to withdraw funds.

The empirical evidence from bank runs and the valuation of illiquid loans and Level 3 assets by investors suggests that illiquidity is important for banks. This should hardly be surprising when banks are financed with short term debt and redeemable funds that are not guaranteed by the government and investors no longer trust regulatory capital ratios because they are based on historical cost and impairments that do not reflect looming expected losses.

Even if loans and debt securities are held to maturity and even if the default risk is (objectively) very low, there may still be refinancing problem in illiquid markets (irrespective of the accounting rules). Also, illiquidity, a lack of transparency, uncertainty, and adverse selection problems were at the heart of the refinancing problems of SPVs that held mortgages for the
collection of cash flows but were financed with short-term debt and redeemable funds. Why should banks not face similar problems in a crisis unless they are primarily financed with long-term debt and guaranteed deposits? Indeed, many banks had similar problems. A prominent example is the run on Northern Rock (Shin, 2009). Thus, the argument that fair values are not relevant cannot be made without taking into account how banks are financed.

- The relevance of fair value information for predicting bank failures and future credit losses

The empirical evidence suggests that fair value information is relevant. (See Landsman, 2007, for a discussion of the evidence.) Blankespoor et al. (2011) compare the association between measures of credit risk and a bank’s leverage. They use three alternative leverage ratios, one where all financial instruments are measured at fair value, one measured in accordance to U.S. GAAP, and one based on Tier 1 capital values. The authors find that the fair value leverage ratio explains bank-specific bond yield spreads of 46 U.S. banks between 2002 to 2010 significantly better than the other two ratios. The increase in explanatory power derives primarily from the valuation of loans and deposits at fair value. The authors also test the predictive power of the three leverage measures for the failure of banks for 1,067 U.S. banks from 1997 through 2009. In the year just prior to the failure, all three measures have similar predictive power, but two and three years prior to failure, the leverage ratio based on faire values dominates the other two measures. The results are consistent with the argument that banks are reluctant to recognize loans so that fair values better reflect credit risk in loans in the crisis.

Cantrell et al. (2011) analyze a related question by looking at whether the reported historical cost or the disclosed fair values of loans (both scaled by the value of gross loans) are a better predictor of next-year’s realized credit losses. They use fair values from 2005 to 2008 to predict credit losses from 2006 to 2009 for a sample of 1,174 U.S. commercial banks and thrifts. The authors find that historical costs are a better predictor of credit losses in the next period than fair values and that fair values are not incrementally informative. Of particular interest is the crisis period. In 2007, non-performing loans begin to increase rapidly; net charge offs also increase but with a lag and at a slower pace. This picture is also reflected in net historical loan values, which decrease but at a fairly slow pace. In contrast, fair values increase in 2007 and 2008 and the mean and median fair values of loans both exceed the mean and median historical costs in both years.
One possible explanation for this finding is a decreasing risk-free interest rate, which could overcompensate for increased expected losses when determining the fair values of loans. Cantrell et al. (2011) do not find evidence that the disclosed fair values of loans provide any additional information above historical cost for the ability to predict bank failures between 2005 and 2010, one to three years prior to failure. The evidence confirms that fair values that rely on models should be accompanied by the disclosure of additional information such as, e.g., information about the historical costs and incurred losses of loans.

- Excess volatility of earnings

A major claim against using full fair value accounting is that it would increase the volatility of earnings and that this increased volatility does not reflect a bank’s business risk, in particular for banks holding loans until maturity. Hodder et al. (2006) look at 202 U.S. bank holding companies from 1995 to 2005 and find that the volatility of net income based on full fair value accounting would indeed be five times larger than the volatility of reported net income. However, they also find that the incremental full fair value income captures elements of bank risk that the market prices. Thus, the market believes that this risk is relevant. What is interesting about this test is that the fair values are relevant even though they are not recognized. The incremental full fair value is the difference between the hypothetical full fair value income and the actual reported income. Thus, banks cannot argue that the recognition of full fair values artificially caused this relevance (e.g., through its effect on regulatory capital or a fixation of analysts and investors on earnings). Instead, the risk seems to be relevant above and beyond its (immediate) effect on the balance sheet. The fair values contain information that investors use to update expected future effects on the balance sheet, and in many situations fair values may be more reflective of the economic situation (the underlying business and refinancing risk) than historical costs.

The results show how full fair value would affect the volatility of net income given the current structure of banks’ assets and liabilities. Banks manage earnings and react to risk. Thus, it is likely that they would have reacted. The benefit of recognizing fair values over merely disclosing them is that this might result in an asset-liability management that better reflects a bank’s economic risk as it aligns incentives to manage the balance sheet and the economic
objectives of asset liability management. To the extent that historical costs are informative, which they probably are, they should still be disclosed.

Reliability: “When models are used to determine fair values, the doors are open for manipulation and earnings management”

Investors are concerned about the manipulation of fair value information to be more reliable if it is based on external sources (e.g., market prices) rather than models and management estimates (e.g., Landsman, 2007). As discussed above, investors’ concern that fair values might be manipulated when they are based on models might be a reason for why investors discount reported Level 3 assets (Kolev, 2009, and Song et al., 2010). Fair value accounting loses many of its benefits for illiquid assets when models are used to determine fair values. But it is not clear that it is a substantial argument against the general use of fair values. Instead, fair values based on models should be accompanied by disclosures that ideally allow investors to judge the validity of the reported fair values. The recognition of fair values is no substitute for the disclosure of information, in particular, when fair values are based on models.

It is interesting to consider loans. In a boom the default risk is low and management judgement is not a big issue; models can readily be applied since the term structure of the risk-free interest is relatively forward to obtain. The fair value is close to the historical cost. In a crisis, when markets are depressed, applying models to value assets is more of a challenge. However, a similar problem arises with impairments. It is not clear that impairments should not be recognized (early) on the ground that it involves management judgement. Coming up with the expected loss of loans has the biggest potential for manipulation but it might still be better to recognize the expected loss than waiting until a loan defaults. Problems of manipulation can be addressed by additional disclosures that help investors to understand the assumptions underlying the models and form their own believes.

- Lessons from securitization

Securitizations played a big role prior to the crisis and there is the concern that securitizations were used to manipulate earnings and engage in regulatory arbitrage. In a securitization a firm (originator) transfers a pool of assets (receivables) to a special purpose vehicle (SPV), which
issues securities and uses the proceeds to pay the originator for the assets. The originator might be one of the investors and also purchase some of the securities. (Alternatively, the originator receives a combination of cash and securities issued by the SPV.) The gain (or loss) from securitization is the difference between the sales proceeds and the carrying value of the assets. In many securitizations, the originator retains an interest in the assets sold so that less than 100% of the cash flow rights are transferred. (See Dechow et al., 2010.) The transaction may still be treated as a sale for accounting purposes. In this case, the assets are derecognized and the retained interest is reported at its fair value. Since there is generally no active market for the retained interest, models are used to derive the fair values. The gain (or loss) from securitization is then the sum of the sales proceeds and the fair value of the retained interest minus the carrying value of the derecognized assets.

Dechow and Shakespeare (2009) find evidence that managers time securitizations to manage earnings and that securitization transactions have a strong effect on the leverage ratio. Dechow et al. (2010) search the 10-K filings of all firms filing with the SEC (excluding quasi-governmental agencies) for firms that report a gain on securitization between September 2000 and December 2005. (In September 2000, SFAS No. 140 became effective, requiring detailed disclosures about securitizations.) Their sample consists of 96 firms from 38 different industries (4-digit SIC code) and they find that both the interest rate used to determine the fair value as well as the average value of the securitization gain vary widely. 92 firm year observations (30% of all observations) stem from ‘national commercial banks’ with an average securitization gain of 1.1% of prior year book value of equity. The firms with the largest average securitization gain relative to prior year book equity are ‘mortgage bankers and loans correspondents’ and ‘personal credit institutions’ with 52.3% and 41.3% respectively. Dechow et al. (2010) find that, controlling for several other possible determinants, the securitization gain is higher when earnings without the securitization gain are low and that management compensation is as sensitive to gains from securitization as to other earnings components. The analysis suggests that the interest rate is used to manage earnings. However, it is difficult to identify which fraction of the gains stems from manipulation.

The real economic effects that the reporting of retained interests at fair value had are not clear. First, the alternative to retaining an interest in an asset portfolio, when a securitization is treated as sale for reporting purposes, is selling the whole asset portfolio to a SPV and purchasing securities issued by the SPV.
Second, Dechow et al. (2010) do not find evidence that the compensation effect differs for better informed or more independent boards. Thus, it might be that the activities were in the interest of the board and that the board wanted to incentivize securitizations. The reasons are not clear, but it is also not clear whether the accounting rules would have changed anything.

Boards can and do contract around accounting and may weight different earnings components differently. For example, in March 2008, the board of Washington Mutual announced that it would exclude the effect of “loans loss provisions other than related to our credit card business” and “expenses related to foreclosed real estate assets” from cash bonuses based on net operating profits for its CEO and 100 other executives (Bauerlein and Simon, 2008).

Third, investors do not interpret earnings naively. For example, Niu and Richardson (2006) find that investors put different weight on earnings from securitizations and other earnings components and treat the former as being less reliable.

Fourth, if investors have the relevant information (i.e., if disclosure is sufficient), they can also understand the implications of off-balance sheet risk. Although many of the securitizations were reported as sales and assets were derecognized from the balance sheet, investors did not ignore the transactions. Landsman et al. (2008) and Niu and Richardson (2006) find evidence that prior to the financial crisis, stock market valuations of a bank’s equity are consistent with shareholders’ believe that banks provide implicit guarantees for SPVs they sponsor.

Given that banks’ shareholders expect implicit guarantees, investors in the SPV’s assets will certainly also expect and pay for these implicit guarantees through servicing fees or higher prices for the SPVs assets. Thus, the securitization results in a profit since the liability of the implicit guarantee is not reported. However, the underlying problem is not one of fair value versus historical cost, but non-recognition of liabilities.

7. Conclusions: Improving financial statements to foster financial stability

Of prime importance for investors and corporate governance is transparency. (See Freixas and Laux (2011) for a discussion of the role of transparency in the crisis.) It is important that disclosures allow investors to form their own expectations. This applies to disclosing the assumptions underlying the models as well as disclosure of individual exposures. Netting exposures is often not sufficient. For example, in the first quarter of 2007, Merrill Lynch reported
a potential exposure of $15.2 billion to certain subprime investments, but revised this number to $46 billion three months later (Story, 2010). Merrill Lynch thought that it protected itself against the difference through hedges and therefore did not report it; many of these hedges later failed. If it had reported the gross positions and the hedges separately, the market could have made its own judgment. Gradual and slow revelation of information of exposures contributes to uncertainty in the market, fear of adverse selection, and refinancing problems of banks.

The difference between disclosure and recognition may not always be of prime importance for informing investors, provided that they obtain the relevant information. Regulatory capital requirements (and managerial contracts) can be adjusted to different reporting standards. Of prime importance for regulation are incentives for banks to hold sufficient capital and take early actions when a crisis starts. In particular, it is important that incentives in the crisis are not distorted by regulation. In this respect an early effect of expected losses on regulatory capital is warranted.

*Expected loss model*

Both standard setters and regulators propose to switch from an incurred loss model to an expected loss model for impairments for loans not recognized at fair value. Under the expected loss model, changes in expected losses (expected cash flows) are recognized. But expected cash flows would be discounted at the loan’s original effective interest rate (effective interest rate model). No gains or losses are recognized if the interest rate changes due to changes in the risk free rate, liquidity premium, or risk aversion.

The expected loss model for impairments is an important step towards more transparency and better regulation. But it is not clear, why at least changes in the risk-free interest term structure should not be considered. As the experience in the U.S. savings and loans (S&L) crisis shows, the importance of the changes in interest rates for banks’ stability should not be underestimated.

But the effect of the expected loss model for impairments on financial stability should not be overestimated and it is no substitute for higher capital requirements. First, before the crisis, in the middle of the housing boom in the U.S., expected losses were very low. Thus, the effect on regulatory capital would have been small in the boom. Moreover, banks held more capital than required so that it is unlikely that it would have had a strong direct effect on the leverage that
banks chose in the boom. Second, as the crisis started, problems unfolded very quickly, even under the incurred loss model.

One advantage of the expected loss model over the incurred loss model is that if forces banks to react earlier. Moreover, the anticipation that expected losses have to be recognized can affect the voluntary capital buffer that banks hold in a boom. Both effects can reduce procyclicality. However, it is also very likely that if banks are forced to take early actions, they might also cut back on lending early. This can be economically efficient. But I am confident that a case can be made that the expected loss model is procyclical in a crisis where banks are forced to reduce lending because of expected losses, which contributes to problems of lenders, thereby increasing expected losses etc. (Again, it shows that accounting involves tradeoffs as there are always costs and benefits to most measures to be taken.)

The ex ante effect that the expected loss model has depends very much on whether banks can expect bailouts and ex post changes of accounting and regulatory rules. The key is whether banks expect governments to yield to their argument that the expected loss model is a main culprit in the crisis, underlying the contractions in lending and refinancing problems in the economy.

Dynamic provisioning as general reserve

A concern that has often been raised in the aftermath of the crisis is that in good economic times, provisions will be too low and, as a consequence, reported profits “too high”. In particular, interest income entails a compensation for expected loan default; banks earn this compensation in good times without bearing credit losses. Thus, profits and bank capital increase, which, “given unchanged capital ratio requirements, makes more rapid growth possible, potentially driving a credit extension boom. And, through the impact on share prices and perhaps bonuses, they can increase management conviction that further rapid growth is desirable.” (Financial Services Authority, 2009, p. 66) A related justification for dynamic provisioning is that loans are systematically mispriced as banks are too overconfident in the boom (e.g., Jiménez and Saurina, 2006).

As a solution to these problems, general dynamic provisions are proposed that banks have to make in good times and that are then released when losses are incurred. However, it is not clear why adjustments in the financial statements through general provisions (that are unrelated to a
bank’s expected losses) would be better than adjustments in the regulatory capital through higher or countercyclical capital requirements. The difference is that the former would also affect income; but it is not clear that the effect on income per se has an effect.

Accounting should provide a clear picture of the bank and not try to correct management’s mistakes, a task which should be left to corporate governance. Also, it is not clear that it would help if corporate governance does not provide the correct incentives. I am not aware of any evidence that dynamic provisioning in Spain really limited potential exuberances in the boom. Did it induce banks to make better lending decisions, hold more capital, and pay lower bonuses in the boom? Are Spanish banks more willing to lend in the recession and better suited to take losses? Underlying the hope that dynamic provisioning might help is a rather static view about how banks and investors respond to regulation and accounting information. As Spain’s BBVA reports in its 2007 annual report, it was run using an economic-capital model, explicitly replacing the required dynamic provisions by its “best estimate of the real risk incurred.” (The Economist, 2009) And indeed, it seems reasonable to do so. Dynamic provisioning is merely a reallocation of when profits are reported with, absent binding capital constraints, little economic effect except for, potentially, taxes if taxes are based on profits net of provisions. But in this case taxes are deferred into the future, which makes lending look more attractive rather than less.

Dynamic regulatory capital requirements

It is often argued that regulatory capital requirements should be dynamically adjusted with higher levels required in the boom and reduced level in the bust. However, banks hold a voluntary capital buffer in the boom. Higher capital requirements in a boom will only be relevant if they exceed the voluntary buffer.

Higher regulatory capital requirements

Compared to what can be achieved through finely tuned accounting and regulatory rules, higher regulatory capital seems to be a more promising avenue to achieve higher financial stability. (For a critical discussion of the counterargument that the cost would be too high, see Admati et al., 2010.)
Accounting is important, but its importance should not be overestimated. I have my doubts that fiddling around with accounting numbers and distorting them through general provisions can be used to prevent managers from making mistakes or markets from overheating (above and beyond what could be achieved through higher capital requirements in the boom).

In 2007 and 2008, U.S. investment banks as well as German Landesbanken failed. The former have a high fraction of fair value assets on their balance sheet, the latter used local GAAP (HGB) for regulatory purposes. In both cases, neither the reporting of fair values nor the focus on historical cost protected them from running into problems or amplified the institutions’ problems. This does not mean that accounting did not have its problems. (For example, the way how risks were consolidated or reflected in the financial statements was insufficient.) But it is very likely that distortions caused by the interventions of governments were an order of magnitude more important than whether the assets were reported at fair value (or historical cost). For example, as Mian et al. (2010) argue, U.S. government policies may have contributed to the expansion of subprime credit through the affordable housing mandate, which required Freddie Mac and Fannie Mae to purchase a fraction of mortgages serving low to moderate income borrowers and which led to a sharp increase in the fraction of subprime mortgage backed securities purchased by the agencies. At the same time, the expectation of government guarantees of these institutions undermined incentives to appropriately account for the risk these activities implied (Duhigg, 2008). In other cases, governance problems at state owned financial institutions contributed to the problems.
References


