

How did Financial Reporting Contribute to the Financial Crisis?

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Abstract

We scrutinize the role financial reporting for fair values, asset securitizations, and derivatives played in the Financial Crisis. Because banks were at the center of the Financial Crisis, we focus our discussion and analysis on the effects of financial reporting by banks. We conclude fair value accounting played little or no role in the Financial Crisis. However, transparency of information associated with asset securitizations and derivatives likely were insufficient for investors to assess properly the values and riskiness of bank assets and liabilities. Although the FASB and IASB have taken laudable steps to improve disclosures relating to asset securitizations, in our view, the approach for accounting for securitizations in the IASB's Exposure Draft that would require banks to recognize whatever assets and liabilities they have after the securitization is executed better reflects the underlying economics of the securitization transaction. Regarding derivatives, we recommend disclosure of more disaggregated information, disclosure of the sensitivity of derivatives' fair values to changes in market risk variables, and implementing a risk-equivalence approach to enable investors to understand better the leverage inherent in derivatives. We also conclude that because the objectives of bank regulation and financial reporting differ, changes in financial reporting needed to improve transparency of information provided to the capital markets likely will not be identical to changes in bank regulations needed to strengthen the stability of the banking sector. Although accounting standard setters and bank regulators should find a common ground, it is the responsibility of bank regulators, not accounting standard setters, to ensure the stability of the financial system.

How did Financial Reporting Contribute to the Financial Crisis?

1. Introduction

The Financial Crisis that began midway through 2007 and continued through the end of 2008 resulted in the collapse of numerous commercial and investment banks, including several high profile institutions such as Bear Stearns, Lehman Brothers, Merrill Lynch, and Wachovia. The crisis resulted in a near systemic collapse of the banking sector, on which commercial lending activity depends. Much has been written about the causes of the crisis, as policy-makers, bankers, and academics offer their somewhat differing insights and perspectives. Most agree the crisis started following the bursting of the housing bubble in the US. The near collapse of the financial sector has resulted in the greatest economic contraction that the US and Europe have seen since the end of the Second World War. As policy-makers work to deal with the problem, pressure is being placed on elected officials to make legislative and regulatory changes to address the underlying causes of the housing bubble and the Financial Crisis.¹

Calls for action to prevent a repeat of the Financial Crisis have also touched on accounting standard setting and the role in which accounting information (or lack thereof) contributed to the Financial Crisis. In this regard, fair value accounting perhaps received the most attention, with many bankers, political figures, and commentators contending that fair value accounting was a major contributing factor to the procyclical decline in the value of bank assets, and hence bank stock prices, when the housing market bubble burst.² However, there are other

¹ For example, draft legislation in the US Senate would greatly revamp the way in which banks are regulated, including merging of the four existing bank supervisory bodies into one Federal oversight body. Other legislation calls for regulation of over-the-counter derivatives, which were central to the collapse of Lehman Brothers and near collapse of AIG. Relatedly, regulators and legislators in several jurisdictions, including the US, UK, EU, and Japan, are considering proposals to regulate hedge funds, including imposing leverage restrictions and disclosure requirements.

² In light of these claims, Section 133 of Troubled Asset Relief Program required the US Securities and Exchange Commission to conduct a study of mark-to-market, i.e., fair value, accounting, focusing on financial institutions, and

aspects of accounting information mandated by accounting standard setters that received less attention but nonetheless may have played a significant role in contributing to the Financial Crisis. The first, which is tied directly to the housing and mortgage lending markets, is the quality of information investors had relating to asset securitizations. Securitizations involve the packaging and selling of mortgages and receivables to generate cash for new loan originations. The second is the quality of information investors had relating to derivatives, including so-called credit default swaps or CDSs.

Our primary goal is to scrutinize the role that financial reporting relating to fair values, asset securitizations, and derivatives played in contributing to the Financial Crisis. Because banks were at the center of the Financial Crisis, we focus our discussion and analysis on the effects of financial reporting by banks. Bank regulators use information provided in bank financial statements as inputs to the calculation of regulatory capital measures and rely on capital markets that trade on the information to discipline bank behavior. As a result, financial reporting and bank regulation are often thought of as being one and the same. Therefore, we begin by discussing the differing objectives of financial reporting and bank regulation to help clarify that information standard setters mandate firms provide to the capital markets and information mandated by bank regulators for prudential supervision will not necessarily be the same. This distinction is important to understanding how financial reporting, in contrast to bank regulation, contributed to the Financial Crisis.

to report its findings to Congress by the end of 2008. In particular, the report focuses on assessing the role the fair value accounting standard, Statement of Financial Accounting Standards No. 157 *Fair Value Measurements*, played in causing bank failures; the impact of standards—particularly those relating to fair value—issued by the Financial Accounting Standard Board (FASB) on the quality of financial information available to investors; the process used by the FASB in developing accounting standards; and the advisability and feasibility of modifications to such standards. The study concludes that the crisis was not precipitated by mark-to-market accounting (US SEC, 2008) and that the process the FASB uses in developing accounting standards is appropriate. See section 3 below for a discussion of these issues.

Our analysis of the way in which financial reporting relating to fair values, asset securitizations, and derivatives potentially contributed to the Financial Crisis is structured similarly for each topic. In particular, for each we summarize the financial reporting requirements of US Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS), and offer insights into whether the information available to investors was sufficiently transparent to make appropriate judgments regarding the values and riskiness of affected bank assets and liabilities. We also summarize available research evidence. Where appropriate, we offer suggestions regarding potential improvements in financial reporting.

Our analysis leads us to conclude that contrary to what many critics of fair value contend, fair value accounting played little or no role in the Financial Crisis. This conclusion is consistent with that of other scholarly and regulatory analyses of the potential link between fair value accounting and the Financial Crisis.³ However, transparency of information associated with measurement and recognition of accounting amounts related to, and disclosure of information about, asset securitizations and derivatives likely were insufficient for investors to assess properly the values and riskiness of affected bank assets and liabilities. In addition, because the objectives of bank regulation differ from the objective of financial reporting, changes in financial reporting requirements to improve transparency of information provided to the capital markets likely will not be identical to the changes in bank regulations needed to strengthen the stability of the banking sector. Moreover, bank regulators have the power to mandate whatever information is needed to meet the objective of prudential supervision. Although it makes sense from the standpoint of efficiency for accounting standard setters and bank regulators to find a common ground, it is the responsibility of bank regulators, not accounting standard setters, to determine how best to ensure the stability of the financial system.

³ See, e.g., SEC (2008), Laux and Leuz (2010), and Shaffer (2010).

2. Different Objectives of Financial Reporting and Bank Regulation

The concepts statements underlying US GAAP and IFRS state that the objective of financial reporting is to provide information that is useful to present and potential investors and creditors and others in making investment, credit, and similar resource allocation decisions (FASB, 2008; IASB, 2008a). This objective applies to general purpose financial reporting for all firms, regardless of industry or whether firms in a particular industry are subject to regulation that uses financial statement information as an input.

The primary objectives of bank regulation are prudential, i.e., to reduce the level of risk to which bank creditors, e.g., depositors, are exposed, and to mitigate systemic financial risks. Although bank regulators use general purpose financial reporting information in meeting their objectives, one should expect that bank regulators would not limit themselves to information contained in general purpose financial reports. For example, in the US, bank regulators require a variety of additional disclosures relating to recognized asset and liabilities, e.g., non-performing loans and deposits, as well as additional information relating to bank risks. In addition, when calculating measures used as input for their supervision of banks, such as regulatory capital, regulators often make their own adjustments to recognized financial statement amounts to better suit their objectives. Regulatory capital need not be equal to financial reporting capital because bank regulators apply so-called “prudential filters,” i.e., specific adjustments when calculating regulatory capital, to meet their objectives of prudential supervision. Examples include whether to neutralize pension surpluses, i.e., recognized pension assets, or gains/losses associated with the fair value option in International Accounting Standard (IAS) 39 (CEBS, 2007). In addition, regulators can adjust the risk weights they assign to specific assets when determining required levels of capital.

Given the differing objectives of financial reporting and bank regulation, it is not surprising that the information each requires of banks differs. For example, presumably the Financial Accounting Standards Board (FASB), which issues US GAAP, and the International Accounting Standards Board (IASB), which issues IFRS, believe that including unrealized gains and losses in recognized amounts meets their objective of enhancing the information banks provide to investors and creditors, but bank regulators believe that including unrealized gains and losses in regulatory capital would yield a measure of bank capital that is less useful for prudential supervision. As a result, whereas US GAAP and IFRS mandate banks measure available-for-sale investment securities at fair value and recognize cumulative unrealized gains and losses in accumulated other comprehensive income, bank regulators generally compute Tier 1 capital after removing these cumulative unrealized gains and losses.

In light of the differing objectives of financial reporting and bank regulation, standard setters should not be surprised that bank regulators make adjustments to general purpose financial statement information for use in prudential supervision. At the same time, bank regulators should not be surprised that accounting standard setters mandate information that is not perfectly suited for prudential supervision. Although it makes sense from the standpoint of efficiency for accounting standard setters and bank regulators to find a common ground (Bushman and Landsman, 2010), it does not make sense for accounting standard setters to issue recognition and measurement standards that meet the needs of one set of users, including bank regulators, while ignoring the informational needs of others. Bank regulators' concerns with, for example, fair value accounting and loan loss provisioning are best addressed by making appropriate adjustments to amounts in general purpose financial statements issued by banks they regulate. For example, if bank regulators believe fair value accounting contributes to procyclical

declines in bank asset prices, for regulatory purposes they can require banks to recognize impairments at other than fair value or can make adjustment to required capital ratios.

Returning to the point that accounting standard setters need to be concerned with the information needs of the capital markets, it is important to note that bank regulators also should be concerned with those needs. Pillar 3 of Basel II states that regulators can rely on capital market disciplining forces as a tool in prudential supervision. That is, the capital markets can serve as a complementary force to direct bank supervision. The extent to which bank regulators can rely on market discipline to perform this role depends on the quality of information available to the capital markets. Thus, if accounting standard setters fail to keep the informational needs of capital markets as their first priority, an unintended consequence is that the effectiveness of market discipline as a regulatory tool could be undermined.⁴

3. Fair Value Accounting

US GAAP and IFRS require recognition of some assets and liabilities—principally financial instruments—at fair value, with some changes in fair values recognized in profit or loss, and the FASB and IASB are jointly considering mandating recognition of essentially all financial assets and liabilities at fair value.⁵ Fair value is defined by the two Boards as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between knowledgeable market participants at the measurement date. Fair value accounting has

⁴ It is responsibility of bank regulators and not accounting standard setters to determine whether the information in the capital markets is sufficient for market discipline to be an effective regulatory tool. For example, if information about risk and leverage of banks engaging in asset securitizations or credit default swap contracts is of poor quality, then the capital markets likely do not have adequate information to provide market discipline on which the regulators rely for prudential supervision.

⁵ US GAAP requires that particular investments and all derivatives be recognized and measured at fair value. The fair value option in US GAAP also permits other financial instruments to be measured at fair value. Key standards that apply are SFAS 115 *Accounting for Certain Investments in Debt and Equity Securities* (FASB, 1993), SFAS 133 *Accounting for Derivative Instruments and Hedging Activities* (FASB, 1998), and SFAS 159 *The Fair Value Option for Financial Assets and Liabilities* (FASB, 2007). IAS 39 contains similar measurement and recognition requirements for IFRS.

been criticized generally and more specifically as a major contributing factor in the Financial Crisis. The general criticism of fair value is that it not the best measurement attribute for conveying decision-useful information to financial statement users. Some other measure, e.g., modified historical cost, is more decision-useful. The criticism has been addressed by accounting researchers by comparing the value relevance of various current value measures to that of historical cost measures. In addition, critics claim that if there are no observable prices on which to base fair value estimates, the estimates can lack decision usefulness because management is afforded the opportunity to manipulate the estimates to meet their own objectives. However, SFAS 157 *Fair Value Measurements* (FASB, 2006) specifies how to estimate fair values, thereby limiting the scope of management's ability to manipulate the estimates.⁶ Critics further contend that even if prices are observable, fair value estimates based on observable prices will not reflect dimensions of asset values about which management has private information. However, SFAS 157 provides observed prices need be used if the price results from a distressed transaction, or if the price relates to an asset that has different attributes from the asset for which management is estimating fair value. In other words, management is required to adjust observed prices to reflect attributes specific to its asset.⁷

The general tenor of the fair value criticisms is that fair value information, particularly in the context of the Financial Crisis, lacks sufficient quality to be informative to investors and other financial statement users. There is a substantial body of accounting research that addresses this criticism using a variety approaches, particularly value relevance. Value relevance is a

⁶ The IASB is expected to issue a similar standard in the near future.

⁷ It is also important note that criticisms of fair value are often raised by parties who have a stake in the outcome of standard setting decisions. An example outside the context of fair value is the opposition by managers of high technology firms to the expensing of stock-based compensation. Dechow, Hutton, and Sloan (1996) reports evidence consistent with the hypothesis that the opposition to the expensing of stock-based compensation arose because of top executives' concerns with public scrutiny of their compensation.

particularly applicable approach to address the relevance and reliability of accounting information because an accounting amount is value relevant only if it is relevant to investors' equity valuation decisions and sufficiently reliable to be reflected in share prices (Barth, Beaver, and Landsman, 2001). Landsman (2007) provides a comprehensive survey of extant value relevance research relating to fair value accounting (see also Barth and Landsman, 1995; Barth, 2004, 2006). Studies that focus particularly on the value relevance of fair values for banks include Barth (1994), Bernard, Merton, and Palepu (1995), Barth, Beaver, and Landsman (1996), Beatty, Chamberlain, and Magliolo (1996), Eccher, Ramesh, and Thiagarajan (1996), and Nelson (1996). Taken together, the fair value literature, including the studies that focus on banks, provides rather substantial evidence that recognized and disclosed fair values are relevant to investors and reliable enough to be reflected in share prices.

Critics of the quality of fair value information also contend that including unrealized gains and losses in earnings makes earnings "too volatile." Barth (2004) makes the observation that there are three primary sources of "extra" volatility associated with fair value-based accounting amounts relative to those determined using modified historical cost. The first is true underlying economic volatility that is reflected in changes in assets' and liabilities' fair values. For earnings to be informative to investors it needs to reflect this volatility. The second, induced volatility arising from using a mixed-attribute accounting model, essentially vanishes if banks measure all financial instruments at fair value as permitted by IAS 39 and SFAS 159. The third is volatility induced by measurement error in estimates of fair value changes. Barth (1994) provides evidence of this in the context banks' investment securities. Nonetheless, it is important to note that this source of volatility exists for all accounting measures that depend on estimates, including those based on modified historical cost. In addition, the importance of the

source of volatility arising from including fair value gains and losses in earnings depends on the informational benefits arising from the relevance of fair values versus any costs arising from this source of volatility. Evidence from the value relevance literature discussed above suggests that the benefits of fair values outweigh their costs.⁸

Critics of fair value contend that although fair values might be value relevant during times of relative market stability, they lack relevance and reliability during times of relative instability.⁹ Because of the recency of the Financial Crisis, evidence from academic research addressing the value relevance of fair values during this time of market instability is not yet available. Thus, the extent to which this criticism is valid remains to be seen. However, because there is nothing inherent in value relevance research that depends on market stability, it is premature to conclude that fair values determined during times of market instability lack relevance and reliability. In addition, it is difficult to conceive of a better alternative to fair value during times of market instability. For example, modified historical cost lacks relevance and other estimates of current value lack the discipline on the estimation process and objectivity associated with fair value measurement.

Relating to criticisms that are ill-informed or made by critics who have a stake in the outcome of standard setting decisions is the claim that fair value accounting was a major factor contributing to the Financial Crisis. The Financial Crisis began with the collapse of the housing

⁸ In a bank regulatory context, Barth, Landsman, and Wahlen (1995) finds that regulatory capital violations based on earnings that includes fair value gains and losses for investment securities help predict future historical cost regulatory capital violations incremental to historical cost regulatory capital violations.

⁹ A related criticism is the “anomalous” earnings effect from the recognition of gains arising from decreases in the fair value of a bank’s liabilities attributable to an increase in the bank’s own credit risk. This criticism is particularly salient during periods of economic downturn, when credit risk increases systemically. As Barth, Hodder, and Stubben (2008) shows, these gains are not anomalous. Rather, recognizing such effects in earnings simply reflects the economics of debt and equity values. Consistent with this, Barth, Hodder, and Stubben (2008) provides evidence that equity returns are less negative when credit risk increases for entities with more debt in the capital structure. Consistent with the observation in Barth (2004) that the mixed-attribute accounting model induces earnings volatility, Barth, Hodder, and Stubben (2008) notes that any potential “anomalous” earnings effects arise from incomplete recognition of asset value changes, not from recognition of debt value changes.

market in the US and quickly spread to other markets worldwide. The bursting of the housing market bubble resulted in the collapse in prices of loans and other financial instruments whose values are tied to housing prices. The decrease in bank asset values necessitated recognition of impairment charges in banks' financial statements. Banks are required by regulators to maintain specified capital ratios to avoid the risk of regulatory intervention. Because bank capital ratios are calculated based on financial statement amounts, the recognized asset impairments caused many banks to sell impaired assets to generate cash, which they used to repay debt to maintain required capital ratios. This process of deleveraging by banks had two macroeconomic effects that are directly tied to the Financial Crisis. First, banks essentially were unable to originate new loans—i.e., extend credit to homebuyers and commercial businesses—thereby beginning the credit crisis and contraction of the economy. Second, as the supply of assets being sold increased, prices declined further. Both of these effects are procyclical, which means that these actions taken by banks caused further decline in bank asset prices and contraction of the economy.

Some have asserted that procyclical effects of asset impairments derive from fair value accounting.¹⁰ However, fair value accounting is not directly related to asset impairments because many of the impaired assets were not recognized at fair value. For example, the largest bank asset, loans, is neither measured at fair value nor impaired to fair value. Therefore, although impairments of loans, i.e., loan loss provisioning, during the Financial Crisis likely had procyclical effects, fair value accounting played no role. Thus, statements that fair value accounting contributed to the Financial Crisis procyclical decline in asset prices can only apply to those bank assets that were either measured at fair value or for which fair values apply when determining impairment.

¹⁰ See Plantin, Sapra, and Shin (2008a, 2008b) for theoretical discussion.

The basic argument tying fair value accounting to procyclicality is the claim by bank managers that their auditors required them to write down affected bank assets to unrealistically low values as reflected by ABX index prices. Because the Financial Crisis caused a drop in liquidity, ABX index prices allegedly reflected distressed prices rather than prices from an orderly market. Bank managers contended that ABX prices, being artificially low relative to the bank managers' perceived asset values, caused unnecessarily large impairment charges. That is, impairment charges would have been lower if bank managers were permitted to use their personal assessments of value, and the economy would have suffered a less severe downturn.

Although, in principle, the “excessive” fair value-related impairment charge could have exacerbated procyclicality of bank asset prices, we believe this is highly unlikely for two reasons.¹¹ First, bank regulators in many countries apply a prudential filter when calculating Tier 1 capital that neutralizes most fair value gains and losses. Thus, temporary changes in fair value do not affect Tier 1 capital. As a result, only fair value losses on equity securities and fair value losses on debt securities that are deemed other than temporary affect Tier 1 capital. Shaffer (2010) provides evidence that the decline in Tier 1 capital for 14 of the largest US banks during the Financial Crisis arising from assets measured at fair value averaged only 2.1%. Because there was undoubtedly some decline in value of all bank assets, 2.1% is the upper bound of the potential effect on Tier 1 capital arising from recognition of impairments of assets measured at fair value using so-called “artificially low” ABX prices.

Second, the proportion of bank assets subject to fair value accounting is limited. Shaffer (2010) reports that at the of the first quarter of 2008, banks held 12% of the their total assets in available-for-sale and held-to-maturity investments; only available-for-sale investments are measured at fair value. However, Laux and Leuz (2010) reports that during the 2004 to 2006

¹¹ See also US SEC (2008), Laux and Leuz (2010), and Shaffer (2010).

period banks held approximately of 50% of their assets in loans and leases, which are not subject to fair value accounting. For the 14 large US banks, Shaffer (2010) reports the decline in Tier 1 capital during the Financial Crisis arising from impairments of loans averaged 15.6%.

Thus, because prudential filters neutralized the effect on Tier 1 capital of most fair value losses and the big effect on Tier 1 capital arose from loan losses, critics' assertions that fair value accounting played a significant contributing role in causing procyclicality of bank asset prices during the Financial Crisis appear to be groundless. However, it is not possible to determine the extent to which fair value accounting would have contributed to procyclicality had the prudential filter relating to fair value losses not been applied. Perhaps a motivation underlying criticism of fair value accounting is the concern that bank regulators might remove this prudential filter.

Although application of the prudential filter relating to fair value gains and losses on investments mitigates procyclical effects of fair value accounting, not all prudential filters relating to fair value do so. Notably, the prudential filter that neutralizes the effects of fair value gains and losses on liabilities arising from changes in own credit risk exacerbates procyclicality. This is because when a bank's credit risk increases (decreases), the value of its liabilities decreases (increases), which results in a gain (loss) and a commensurate increase (decrease) in equity. Neutralizing this effect in times of economic decline (growth) results in decreases (increases) in equity and Tier 1 capital, which is procyclical.

Regardless of any role that fair value accounting played in the Financial Crisis, it is important to recall that it is the responsibility of bank regulators, not accounting standard setters, to determine how best to mitigate the effects of procyclicality on the stability of the banking system. To meet their objectives of prudential supervision, bank regulators have many tools at their disposal, including application of prudential filters (as illustrated by the filter for fair value

losses on available-for-sale debt securities), relaxation of regulatory capital ratios during economic downturns, e.g., by altering risk-weighting of specific assets, and use of counter-cyclical measures in loan loss provisioning for regulatory purposes.¹² Moreover, as noted earlier, the effectiveness of market discipline as a regulatory tool could be undermined if investors' informational needs were hindered by not having impairments for bank assets measured at fair value as required by IFRS or US GAAP.

4. Asset Securitizations

At the heart of the credit crisis of 2007-2008 is asset securitization, a Wall Street innovation that became a large source of financing beginning in the early 1990s. By the end of 2007, the outstanding securitization market was valued at \$9.3 trillion, making it over twice the size of US treasuries, which were valued at \$4.5 trillion. Asset securitizations enable banks—as well as other sponsor-originators of securitizations—to obtain cash for assets transferred to another entity. In a typical securitization, the bank that originates assets sets up a special purpose entity, or SPE, that borrows funds from third parties to purchase the securitized assets, typically loans, from the bank, using the assets as collateral. Securitizations provided benefits to banks by enabling them to diversify their asset holdings, by extending their capital base to wholesale money markets, and by enabling them to increase regulatory capital by keeping off-balance sheet assets and debt that otherwise would be on-balance sheet. Banks usually retain an interest in the SPE representing a subordinated interest in the SPE's assets to mitigate the information asymmetry regarding the riskiness of the transferred assets. Because SPEs are simply passive trusts, banks also usually manage the assets for their SPEs.

¹² In the response to the Financial Crisis, the Basel Committee on Banking Supervision recently issued a consultative document seeking input on proposed to regulatory requirements to strengthen the resilience of the banking sector (BIS, 2009).

Growth in the securitization market was a major contributing factor to the growth in the credit markets that enabled the housing boom that went bust.¹³ The direct reason for this is that banks could originate more and riskier loans than would have been the case otherwise. The more subtle, indirect reason is that because investors had little information about the quality of loans the banks originated and transferred to SPEs, investors were unable to provide appropriate market discipline to prevent excess lending.¹⁴

Investors not only had difficulty evaluating the quality of loans banks originated and transferred to SPEs, but also had difficulty evaluating the fair value and risk of SPE assets after the initial transfer of assets. The latter difficulty prevented SPE investors from applying appropriate market discipline to ensure that securities the SPE purchased that were issued by other SPEs were properly priced to reflect the risk of the assets underlying the securitizations of the other SPEs, e.g., bank loans and credit card receivables. This problem became even more difficult the farther the SPE's assets were removed from the assets underlying the securitizations. For example, it is more difficult for investors in SPE4 to determine the value of their investment when SPE4 holds securities issued by SPE3, which in turn holds securities in SPE1 and SPE2, which hold the securitized loans and credit card receivables, than it is for investors in SPE3 to determine the value and riskiness of their investment.

¹³ To gain better perspective on the magnitude of the growth in the credit markets during the US housing boom, the ratio of household debt to Gross Domestic Product in the US, which had been roughly stable at 80% of personal income until 1993, had risen to 120% in 2003 and to nearly 130% by mid-2006 (Reinhart and Rogoff, 2009). Relating to the bust, US household debt declined by \$13.5 trillion in 2009, amounting to \$43,874 per capita, with most of the reduction attributable to mortgage loan defaults (Americans Pare Down Debt, Mark Whitehouse, *Wall Street Journal*, March 12, 2010).

¹⁴ Non-transparency of information about assets banks securitized is not the only cause of the housing boom. Although poor quality of information about securitized assets contributed to excessive risky lending practices that precipitated the housing bubble, there was plenty of blame to go around. Several factors contributed to the housing boom, including the availability of cheap credit arising from monetary policy decisions by the Federal Reserve Bank, Congressional mandates for Fannie Mae and Freddie Mac to expand lending to non-traditional borrowers from low-income groups, and the failure of credit rating agencies to issue credit ratings for banks that reflect appropriately the riskiness of bank loans and other assets transferred to the SPEs (Barth, Ormazabal, and Taylor, 2009).

Because banks retain an interest in SPEs they originate, bank investors face the same difficulties as other SPE investors in valuing and assessing the riskiness of SPE assets, and thus the bank's retained interest in the SPE. An additional challenge bank investors face is that for reputational or other reasons, the bank may assume more risk related to the SPE's assets than is required by the securitization agreement. If this occurs, then the bank's risk of loss exceeds the value of its retained interest. As an example of a bank assuming such additional risk, in December 2007 Citigroup voluntarily reacquired assets with a value \$49 billion from several of its SPEs by assuming liabilities of approximately \$87 billion.

Before and during the Financial Crisis, financial reporting for asset securitizations in the US was specified in Statement of Financial Accounting Standards (SFAS) No. 140, *Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities* and *Financial Interpretation 46R* (FIN 46R). SFAS 140 essentially provides that an asset transfer be accounted for as a sale—with assets derecognized from the originating bank's statement of financial position—if a set of guidelines is met, including legal title transfer and no explicit recourse provisions. If the transaction fails to meet this set of guidelines, the bank recognizes the proceeds received as debt and separately presents the assets as pledged as security for the debt. FIN 46R provides broad guidance on whether the SPE's financial statements are to be consolidated with those of the bank. To obtain the benefits of securitizations described earlier, banks structured most securitizations to obtain sale accounting treatment and to avoid consolidation of the SPE.¹⁵

¹⁵ Requirements for sale accounting in IFRS are broadly similar to those in US GAAP. However, US GAAP bases control on legal isolation, whereas IFRS focuses on risks and rewards. As a result, US GAAP and IFRS can result in quite different derecognition outcomes. In addition, application of IFRS generally more frequently results in consolidation than does application of US GAAP. This could account for the fact that the securitization market was far more extensive in the US than in countries in which firms applied IFRS.

SFAS 140 required banks that transfer assets to SPEs via securitizations that qualify as sales to disclose separately, among other things, the total principal amount of financial assets that the bank managed on behalf of its SPEs, gains from securitizations during the year, and the book value of any retained interest. SFAS 140 did not require disclosure of the fair value of retained interest, the fair value of assets and liabilities of its SPEs, or information to enable bank investors to assess the risk related to the bank's retained interest. For example, the disclosures did not include the extent to which the retained interest was subordinated to other SPE investors' claims to the SPE assets. Further, because SFAS 140 prohibited sale accounting when there was explicit recourse to the bank, SFAS 140 disclosures also contained no information regarding implicit agreements between the bank and its SPEs for the bank to guarantee performance of the securitized assets. Thus, SFAS 140 disclosures were of limited usefulness to bank investors to assess any additional risk related to the SPE's assets than was required by the securitization agreement.

Despite the lack of transparency of securitizations provided by accounting disclosures, empirical research provides evidence that investors include the information provided in the disclosures when assessing the value and risk of securities issued by banks engaging in asset securitizations. Using managed assets and liabilities as proxies for SPE asset and liabilities, Landsman, Peasnell, and Shakespeare (2008) shows that equity investors view SPE assets and liabilities as belonging to the sponsor-originators, including banks, i.e., the risk and rewards of ownership of the assets reside with banks and not their SPEs. Nui and Richardson (2006) shows that off-balance sheet debt related to asset securitizations has the same risk relevance as recognized debt for explaining market measures of equity risk, i.e., the Capital Asset Pricing Model beta. Chen, Lui, and Ryan (2008) shows that equity investors consider the characteristics

of the assets securitized when assessing the extent to which banks retain equity risk associated with securitized assets. Cheng, Dhaliwal, and Neamtiu (2008) finds that banks that undertake securitizations have higher information uncertainty, i.e., higher stock price bid-ask spreads and analyst forecast dispersion, compared to banks without such transactions, and that information uncertainty increases with the amount of the securitized assets. Barth, Ormazabal, and Taylor (2009) finds that the bond market views the risk of the assets securitized by the banks as residing with the banks, which is consistent with much of the equity market evidence. However, in marked contrast, the study finds that when assessing bank credit risk it appears that credit rating agencies largely ignore asset securitizations.

Although the research shows that investors include the information provided in the disclosures when assessing the value and risk of securities issued by banks engaging in asset securitizations, the question remains whether they do so appropriately. For example, although Barth, Ormazabal, and Taylor (2009) finds the bond market views the risk of the assets securitized by the banks as residing with the banks, it is possible that the risk of such assets resides with the banks' SPEs. More generally, the extent to which the risk of such assets resides with the banks may differ from the bond market's assessment, which is based on information that is not fully transparent. It is also important to note that even if investors properly assessed the risks that securitized assets posed to banks, this does not imply that market discipline was adequate to prevent excessive lending by banks. For example, investors could have understood correctly that banks would not bear the risk of potential non-performance of assets transferred to SPEs because third parties—e.g., taxpayers—would make up for any cash flow shortfalls, and therefore could have concluded that the amount of lending by banks was not excessive. Despite the fact that investors could have been exercising appropriate market discipline, systemic

excessive lending could have occurred because of the effects of other incentives banks faced (see footnote 8).

It is possible that more transparent financial reporting by banks would have mitigated the extent of the housing boom and subsequent bust that precipitated the Financial Crisis. In the wake of the Financial Crisis, both the FASB and IASB have taken steps to improve financial reporting requirements relating to asset securitizations. In June 2009, the FASB issued SFAS 166 *Accounting for Transfers of Financial Assets*, which amends SFAS 140, and SFAS 167 *Amendments to FASB Interpretation (FIN) No. 46(R)*. As a result of these two standards, most SPE assets and liabilities must now be consolidated with those of the originating bank, bringing US GAAP more in line with IFRS. In addition, US banks are now required to provide enhanced disclosures to investors, including fair values of their SPEs' assets and liabilities. The required disclosures also include qualitative and quantitative information regarding the bank's continuing involvement with the securitized assets that provides investors with information to assess the reasons for the continuing involvement and the risks related to the assets to which the bank continues to be exposed.

The IASB has also taken steps to improve the financial reporting requirements relating to assets securitizations. In March 2009, the IASB issued an Exposure Draft, *Derecognition Proposed Amendments to IAS 39 and IFRS 7* (IASB, 2009). The Exposure Draft proposes to retain the basic approach to derecognition in IAS 39, which has elements in common with SFAS 166. The Exposure Draft also offers an alternative approach, which would require banks and other transferors to derecognize the transferred assets and recognize as assets and liabilities all the rights and obligations either retained or obtained in the transfer, including forward contracts, puts, calls, guarantees, or disproportionate involvement with respect to the transferred cash

flows, at their fair values. The approach would result in recognizing these rights and obligations as if the transferred assets had not previously been owned. The subsequent accounting for these newly recognized assets and liabilities would be determined by their nature—for example, derivatives obtained in the transfer would be measured subsequently at fair value.

This alternative approach differs from the approaches in IAS 39 and SFAS 166 in that those standards require transferors to make a determination as to whether the securitized assets have been sold. In contrast, there is no sale notion in the Exposure Draft's alternative approach. In our view, because the alternative approach results in banks recognizing the assets and liabilities they have after the transfer, the approach better reflects the underlying economics of the securitization transaction and therefore is likely to result in more transparent financial reporting. The sale or secured borrowing alternatives in IAS 39 and SFAS 166 rarely would capture the economics of these transactions because the transactions are rarely pure sales or pure borrowings.¹⁶ Regarding disclosures, in December 2008 the IASB issued an Exposure Draft, *Consolidated Financial Statements* (IASB, 2008b), that proposes expanded disclosures about asset securitizations that are similar to those in SFAS 167.

Although accounting standard setters are in the process of improving the transparency of information relating to assets securitizations, thereby enhancing the effectiveness of the market discipline pillar of prudential supervision, bank regulators can also take steps to improve transparency. In addition, to ensure securitizations do not expose banks to excessive risk, bank regulators can alter the ways in which securitized assets are used to calculate regulatory capital

¹⁶ Similar comments apply to repurchase agreement transactions. Release of the Lehman Brothers bankruptcy examiner's report in March 2010 reveals that Lehman Brothers made extensive use of sale treatment for recognition of many of its repurchase agreements. As a result, many commentators contend that these transactions should have been recognized as secured borrowings. Without knowing the details of each transaction, it is not possible to determine whether recognition as a sale or as a secured borrowing, or recognition of assets and liabilities using the alternative approach would have best reflected the underlying economics of the transactions.

and their supervisory review of banks.¹⁷ Going forward, it is important for bank regulators to work with accounting standard setters to help ensure information relating to asset securitizations provided in bank financial statements contributes to market discipline by complementing the information necessary for prudential bank supervision.

5. Derivatives

Derivatives were also at the center of the Financial Crisis because they magnified the risk to which investors in derivatives and equities of firms holding derivatives were exposed. The credit default swaps, or CDS, contracts sold by AIG are a case in point. A CDS is essentially an insurance contract on a bond. For example, if a bank buys corporate debt, it can enter into an agreement with a counterparty, e.g., AIG, to receive payment of the principle in the event of default. In the years leading up to the Financial Crisis, hedge funds and investment banks expanded their demand for insurance to cover their holdings in asset-backed debt securities issued by SPEs arising from the growth in the securization market. In response to this demand, AIG wrote CDS contracts without offsetting the risk by buying CDS protection for itself from another counterparty, i.e., AIG wrote “naked” CDSs. Credit default swaps written by AIG covered more than \$440 billion in bonds, most of which was related to debt issued by Lehman Brothers. Because AIG did not have enough cash to honor its CDS contracts when Lehman Brothers defaulted on its debt, the US government gave financial support to AIG. The government did so because of concern that if AIG defaulted on its CDSs with investment banks, commercial banks, and hedge funds, the entire financial system would collapse. Had AIG defaulted, each bank/hedge fund would have had to sell other assets to meet its own obligations, thereby fueling a market-wide downward pressure on asset prices.

¹⁷ For example, regarding the calculation of regulatory capital, in 2001 US regulators began to require most banks to maintain capital that is equal to the book value of the retained interest.

The key issue for us is not whether AIG should have been permitted to do this, or more generally whether derivatives markets should be regulated. This is another debate. Rather, we are interested in the question of whether and to what extent transparency of accounting information contributed to the risk to which the financial system was exposed by derivatives. In other words, did investors have sufficient information to provide adequate market discipline by pricing appropriately the derivatives and equities of firms engaging in derivatives contracts. More specifically, did investors understand the risks CDSs posed to AIG and its counterparties?

IFRS and US GAAP have similar accounting standards relating to derivatives. The two primary standards relating to recognition and measurement are IAS 39 *Financial Instruments: Recognition and Measurement* and SFAS 133 *Accounting for Derivatives and Hedging Activity*. These standards require recognition of all derivatives at fair value on the statement of financial position. Whether gains and losses on derivatives are recognized in profit or loss or as part of other comprehensive income depends on whether and how the derivatives are used to hedge financial risks. The two primary standards that were in effect at the outset of the Financial Crisis relating to disclosure of derivatives are IAS 32 *Financial Instruments: Disclosure and Presentation* and SFAS 119 *Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments*. Although there are differences between the standards, each requires disclosure relating to derivatives gains and losses, fair values at the end of the reporting period, and the purposes for which the derivatives are held. Effective at the end of calendar year 2007, IFRS 7 *Financial Instruments: Disclosures* replaced the disclosure requirements in IAS 32 and mandates disclosure of qualitative information relating to financial instruments' liquidity, credit, and market risks.

We believe that the recognition and measurement standards for derivatives greatly improved the transparency of banks' financial statements. Findings in Ahmed, Kilic, and Lobo (2006) provide empirical evidence of such improvement. Under prior standards, it was difficult if not impossible for investors to assess the value of firms' derivatives positions. For example, because many derivatives have negligible cost, basing recognition and measurement on a modified cost approach would provide investors with little to no information about the value or the risk of a bank's derivative positions. However, although fair value is perhaps the most relevant single summary measure of derivatives, it is impossible for a single measure to provide all the information investors need to assess the value of such instruments and the risk they pose to banks. The disclosures required by IFRS and US GAAP are meant to address the needs of investors by providing additional information about derivatives fair values and their risks.

Although the derivatives disclosures likely are informative to investors, their usefulness is limited by the extent to which the information is aggregated. For example, AIG's 2006 annual report provides a table listing aggregate notional amounts for interest rate swaps, credit default swaps, currency swaps, and other derivatives, disaggregated by maturity. Because the amounts are aggregated, financial statement users cannot determine which side of each contract AIG holds or who the counterparties are and therefore the risk the contracts posed.¹⁸ In addition, notional amounts are simply the basis on which derivatives are contracted. Notional amounts bear no direct relation to the value or risk of derivatives.

¹⁸ US bank regulators require disaggregation of some contracts by whether the bank is a buyer or a seller of the contract. For example, US banks must disclose to regulators the notional amounts for credit default swaps contracts they have bought and sold. However, this disaggregation is not required for all derivatives, e.g., futures contracts. In addition, even for derivatives for which such disaggregated is provided, as with financial statement disclosures, no information about counterparty risk is provided. Because AIG is not a bank but rather an insurance company, these additional requirements do not apply.

Extant research on the relevance of derivatives disclosures is not extensive, in large part because, as described above, it is difficult to use the disclosures to operationalize measures of risk for determining whether the disclosures contain risk-relevant information. Wong (2000) attributes the inability of foreign exchange risk disclosures to help investors assess the sensitivity of equity returns to currency fluctuations to inadequacy of the disclosures, particularly because of the level of aggregation of notional amounts. Despite these inadequacies of the disclosures, for a sample of US banks, Venkatachalam (1996) shows net notional amounts of derivatives are value relevant incremental to other bank assets and liabilities.¹⁹

To understand better the risks posed by derivatives to banks, investors need to know the nature of the risk relating to the underlying instrument that drives the value and risk of the derivative. Certainly, investors can better assess these risks if they know which side of each contract a bank holds and who the counterparties are. IFRS 7 moves in the direction of helping investors assess the risk of derivatives by requiring sensitivity of the fair values of financial instruments, including derivatives, to reasonably possible changes in relevant market risk variables. For example, in the case of an interest rate swap, a bank would provide information regarding the effect of interest rate changes on changes in the value of the swaps.²⁰

Another potentially informative disclosure would be to show what the effects on the statement of financial position would be of implementing a “risk-equivalence” approach to accounting for some classes of derivatives. Under a risk-equivalence approach, the implied gross assets and liabilities associated with derivatives contracts that, on net, have risk equivalent

¹⁹ See Barth’s summary of the extant research on risk and financial reporting in Schrand and Elliott (1998).

²⁰ As an illustration, in its disclosure relating to its Level 3 fair value estimates in its 2008 annual report, the Royal Bank of Scotland (RBS) discloses that the recognized fair value of its interest rate and commodity derivatives was £2.2 billion, and the increase and decrease in value associated with reasonably possible alternative assumptions were £0.13 billion. RBS also discloses that the recognized fair value of its credit derivatives was £8.0 billion, and the increase and decrease in value associated with reasonably possible alternative assumptions were £1.03 and £1.20 billion.

to the derivatives are separately identified. This permits investors and other financial statement users to gain insight into the risk arising from the leverage inherent in derivatives.

For example, consider a bank that sells a 5-year credit default swap on a 5-year B-rated loan with value of € billion. This CDS provides that the bank receive an annual cash flow as compensation for the credit enhancement it provides to the buyer of the CDS. The enhancement is the difference between the B credit rating of the underlying loan and the credit rating of a loan with the same terms issued by the bank, which presumably is higher than B. Assuming the CDS is properly priced, the amount of cash the bank receives from the CDS buyer would be the difference between the interest on the B-rated loan and the interest the bank would have to pay on a € billion loan with the same terms. The risk of the CDS to the bank is equivalent to it borrowing € billion for 5 years and buying the underlying B-rated loan. To see this, note that if the bank entered into these two transactions, the net interest cash flows it would receive exactly equals the cash flows it would receive under the CDS contract. In addition, the principal payments exactly offset. If the B-rated loan is repaid, under the CDS contract the bank will make no payments to the CDS holder. Under the risk-equivalent transactions, i.e., the bank buying the B-rated loan and borrowing the same amount, the bank will use the proceeds from the B-rated loan to repay its own debt of the same amount. If the B-rated issuer defaults and the loan is worthless, under the CDS contract the bank will pay the principal of the B-rated loan to the CDS holder; under the risk-equivalent approach, the bank's B-rated loan asset is worthless but the bank still must repay the principal of its own borrowing.

The advantage of the risk-equivalence approach is that it permits financial statement users to understand the implied economic leverage position of the bank. To see this, let us return to the CDS example and assume that credit deterioration of the issuer of the B-rated loan

guaranteed by the bank resulted in the loan decreasing in value to €1.5 billion at the end of the year of issuance. Assuming no change in credit worthiness of the bank, this implies the CDS has a fair value of €0.5 billion, which would appear as a liability on the bank's statement of financial position. However, without additional disclosure, financial statement users cannot assess fully the economic leverage position of the bank, which is equivalent to holding an asset—the underlying loan—worth €1.5 billion, and having debt of €2 billion. That is, the €0.5 billion recognized CDS liability suggests that the bank's exposure is €0.5 billion, when in reality its risk of loss is €2 billion.

Although a risk-equivalence approach provides useful information to financial statement users in assessing the risk associated with CDSs and other derivatives, we do not advocate recognizing the risk-equivalent assets and liabilities. This is because such assets and liabilities are not literally assets and liabilities of the bank and, consequently, do not meet the definitions of assets and liabilities in US GAAP and IFRS. We do, however, advocate disclosing this information in the financial statements. Moreover, as the example illustrates, to permit financial statement users to assess fully the riskiness of the bank's leverage position, it is important to disclose the fair values of the risk-equivalent assets and liabilities at each financial statement date. Simply reporting the notional amounts of the derivatives is not adequate. Note that our suggestion to provide disclosure of the fair value of risk-equivalent assets and liabilities applies to all derivatives, including those arising from recognition of derivatives in connection with asset securitizations as described in section 4.

As with asset securitizations, although accounting standard setters are in the process of improving the transparency of information relating to derivatives, bank regulators can also take steps to improve transparency as well as incorporate the effects of derivatives in their calculation

of regulatory capital. For example, regulators can calculate regulatory capital using risk-equivalent gross assets and liabilities, rather than the derivatives themselves, if the regulators believe doing so is more useful for bank supervision.

6. Conclusion

We scrutinize the role that financial reporting for fair values, asset securitizations, and derivatives played in contributing to the Financial Crisis. Because banks were at the center of the Financial Crisis, we focus our discussion and analysis on the effects of financial reporting by banks. We begin by discussing the objectives of financial reporting and bank regulation to help clarify that information standard setters mandate firms provide to the capital markets and information mandated by bank regulators for prudential supervision will not necessarily be the same. This distinction is important to understanding why financial reporting played a limited role in contributing to the Financial Crisis.

We analyze the way in which financial reporting for fair values, asset securitizations, and derivatives potentially contributed to the Financial Crisis. For each topic we summarize the financial reporting requirements of US GAAP and IFRS, offer insights into whether the information available to investors was sufficiently transparent to make appropriate judgments regarding the values and riskiness of affected bank assets and liabilities, and summarize available research evidence.

Our analysis leads us to conclude that contrary to what many critics of fair value contend, fair value accounting played little or no role in the Financial Crisis. However, transparency of information associated with measurement and recognition of accounting amounts relating to, and disclosure of information about, asset securitizations and derivatives likely were insufficient for investors to assess properly the values and riskiness of affected bank assets and liabilities. The

FASB and IASB have taken laudable steps to improve disclosures relating to asset securitizations by requiring enhanced disclosures, including fair values of securitized assets and liabilities and qualitative and quantitative information regarding a bank's continuing involvement with the securitized assets, to enable market participants to assess the risks related to the assets to which the bank is exposed. However, in our view, the alternative approach for accounting for securitizations in the IASB's Exposure Draft that would require banks to recognize whatever assets and liabilities they have after the securitization is executed better reflects the underlying economics of the securitization transaction and therefore, coupled with enhanced disclosures about derivatives, is likely to result in more transparent financial reporting.

For derivatives, our recommendations include disclosure of disaggregated information to permit investors to know which side of the contracts a bank holds and who the counterparties are, disclosure of the sensitivity of the fair values of derivatives—as well as other financial instruments measured at fair value—to changes in relevant market risk variables. We also recommend implementing a risk-equivalence approach to enhance disclosures relating to the leverage inherent in derivatives.

Finally, we conclude that because the objectives of bank regulation differ from the objective of financial reporting, changes in financial reporting requirements to improve transparency of information provided to the capital markets likely will not be identical to the changes in bank regulations needed to strengthen the stability of the banking sector. Moreover, bank regulators have the power to mandate whatever information is needed to meet the objective of prudential supervision. Although it makes sense from the standpoint of efficiency for accounting standard setters and bank regulators to find a common ground, it is the responsibility

of bank regulators, not accounting standard setters, to determine how best to ensure the stability of the financial system.

References

- Ahmed, A.S., E. Kilic, and G.J. Lobo, 2006, Does recognition versus disclosure matter? Evidence from value-relevance of banks' recognized and disclosed derivative financial instruments, *The Accounting Review* 81, 567-588.
- Barth, M.E., 1994, Fair value accounting: Evidence from investment securities and the market valuation of banks, *The Accounting Review* 69, 1-25.
- Barth, M.E., 2004, Fair values and financial statement volatility, in: *The Market Discipline Across Countries and Industries*, Edited by Claudio Borio, William Curt Hunter, George G. Kaufman, and Kostas Tsatsaronis, Cambridge, MA: MIT Press.
- Barth, M.E., 2006, Including estimates of the future in today's financial statements, *Accounting Horizons* 20, 271-285.
- Barth, M.E., W.R. Landsman, 1995, Fundamental issues related to using fair value accounting for financial reporting, *Accounting Horizons* 9, 97-107.
- Barth, M.E., W.H. Beaver, and W.R. Landsman, 1996, Value-relevance of banks' fair value disclosures under SFAS 107, *The Accounting Review* 71, 513-537.
- Barth, M.E., W.H. Beaver, and W.R. Landsman, 2001, The relevance of the value relevance literature for financial accounting standard setting: Another view, *Journal of Accounting and Economics* 31, 77-104.
- Barth, M.E., L.D. Hodder, and S.R. Stubben, 2008, Fair value accounting for liabilities and own credit risk, *The Accounting Review* 83, 629-664.
- Barth, M. E., W. R. Landsman, and J. Wahlen, 1995, Fair Value Accounting: Effects on Banks' Earnings Volatility, Regulatory Capital, and Value of Contractual Cash Flows. *Journal of Banking and Finance*, 577-605.
- Barth, M.E., G. Ormazabal, and D.J. Taylor, 2009. Asset securitizations and credit risk. Working paper, Stanford University Graduate School of Business.
- Bank for International Settlements, Basel Committee on Bank Supervision, 2009. Consultative Document, Strengthening the resilience of the banking sector. Basel, Switzerland, December.
- Beatty, A., S. Chamberlain, and J. Magliolo, 1996, An empirical analysis of the economic implications of fair value accounting for investment securities, *Journal of Accounting and Economics* 22, 43-77.
- Bernard, V. L., R. C. Merton, and K. G. Palepu, 1995, Mark-to-market accounting for U.S. banks and thrifts: Lessons from the Danish experience, *Journal of Accounting Research* 33, 1-32.

- Bushman, R. and W.R. Landsman, 2010, The pros and cons of regulating corporate reporting: a critical review of the arguments, *Accounting and Business Research*, forthcoming.
- Chen W., C. Liu, and S. Ryan, 2008, Characteristics of securitizations that determine issuers' retention of the risks of the securitized assets, *The Accounting Review* 83, 1181-1215.
- Cheng, M., D. Dhaliwal, and M. Neamtiu, 2008, Banks' asset securitization and information uncertainty, Working paper (University of Arizona).
- Committee of European Banking Supervisors. 2007. Analytical report on prudential filters for regulatory capital, 5 October. http://www.c-eps.org/getdoc/d0ce6620-b3f7-40a5-8e5b-bc380f22f6ce/145Final_Analytical_report_on_prudential_filters.aspx.
- Dechow, P.M., A.P. Hutton, and R.G. Sloan, 1996, Economic consequences of accounting for stock-based compensation, *Journal of Accounting Research* 34, 1-20.
- Eccher, A., K. Ramesh, and S. R. Thiagarajan, 1996, Fair value disclosures bank holding companies, *Journal of Accounting and Economics* 22, 79–117.
- Financial Accounting Standards Board, 1993, Statement of Financial Accounting Standards No. 115, Accounting for certain investments in debt and equity securities (Financial Accounting Standards Board, Norwalk, CT).
- Financial Accounting Standards Board, 1998, Statement of Financial Accounting Standards No. 133, Accounting for derivative instruments and hedging activities (Financial Accounting Standards Board, Norwalk, CT).
- Financial Accounting Standards Board, 2000, Statement of Financial Accounting Standards No. 140, Accounting for transfers and servicing of financial assets and extinguishments of liabilities (Financial Accounting Standards Board, Norwalk, CT).
- Financial Accounting Standards Board, 2003, Financial Interpretation No. 46, Consolidation of variable interest entities (Financial Accounting Standards Board, Norwalk, CT).
- Financial Accounting Standards Board, 2006, Statement of Financial Accounting Standards No. 157, Fair value measurements (Financial Accounting Standards Board, Norwalk, CT).
- Financial Accounting Standards Board, 2007, Statement of Financial Accounting Standards No. 159, The fair value option for financial assets and liabilities (Financial Accounting Standards Board, Norwalk, CT).
- Financial Accounting Standards Board, 2008, Exposure Draft, Conceptual Framework for Financial Reporting: The Objective of Financial Reporting and Qualitative Characteristics and Constraints of Decision-Useful Financial Reporting Information (Financial Accounting Standards Board, Norwalk, CT).

- Financial Accounting Standards Board, 2009a, Statement of Financial Accounting Standards No. 166, Accounting for transfers of financial assets—an amendment of FASB statement no. 140 (Financial Accounting Standards Board, Norwalk, CT).
- Financial Accounting Standards Board, 2009b, Statement of Financial Accounting Standards No. 167, Amendments to financial interpretation no. 46(R) (Financial Accounting Standards Board, Norwalk, CT).
- International Accounting Standards Board, 1999, International Accounting Standard 39, Financial instruments: recognition and measurement (International Accounting Standards Board, London, UK).
- International Accounting Standards Board, 2008a, Exposure Draft of An Improved Conceptual Framework for Financial Reporting: Chapter 1: The Objective of Financial Reporting (International Accounting Standards Board, London, UK).
- International Accounting Standards Board, 2008b, ED 10 Consolidated Financial Statements (International Accounting Standards Board, London, UK).
- International Accounting Standards Board, 2009, Derecognition, Proposed amendments to IAS 39 and IFRS 7 (International Accounting Standards Board, London, UK).
- Landsman, W.R., 2007, Is fair value accounting information relevant and reliable? Evidence from capital market research, Accounting Business & Research Special Issue: International Accounting Policy Forum, 19-30.
- Landsman, W., K. Peasnell, and C. Shakespeare, 2008, Are asset securitizations sales or loans?, The Accounting Review 83, 1251.
- Laux, C., and Leuz, C., 2010, Did Fair-Value Accounting Contribute to the Financial Crisis?, Journal of Economic Perspectives, forthcoming.
- Nelson, K. K., 1996, Fair value accounting for commercial banks: An empirical analysis of SFAS No. 107, The Accounting Review 71, 161–82.
- Niu, F., Richardson, G., 2006, Are securitizations in-substance sales or secured borrowings: Capital market evidence, Contemporary Accounting Research 23, 1105–1133.
- Plantin, G., H. Saprà, and H. S. Shin. 2008a. Fair value accounting and financial stability. Financial Stability Review 12, Banque de France, Paris.
- Plantin, G., H. Saprà, and H. S. Shin. 2008b. Marking-to-market: Panacea or Pandora's box. Journal of Accounting Research 46, 435-460.

- Reinhart, C.M., and K.S. Rogoff, 2009, *This time Is different: eight centuries of financial folly*, Princeton University Press, Princeton, NJ.
- Schrand, C.A. and J.A Elliot, 1998, Risk and financial reporting: a summary of the discussion at the 1997 AAA/FASB conference, *Accounting Horizons* 12, 271-282.
- Shaffer, S., 2010, Fair value accounting: villain or innocent victim – exploring the links between fair value accounting, bank regulatory capital and the recent financial crisis, Working paper (Federal Reserve Bank of Boston Quantitative Analysis Unit).
- United States Securities and Exchange Commission, 2008. Report and recommendations pursuant to Section 133 of the Emergency Economic Stabilization Act of 2008: Study on mark-to-market accounting.
- Wong, M. H. F., 2000, The association between SFAS no. 119 derivatives disclosures and the foreign exchange risk exposure of manufacturing firms, *Journal of Accounting Research* 38, 387-417.
- Venkatachalam, M., 1996, Value relevance of banks' derivative disclosures, *Journal of Accounting and Economics* 22, 327-355.