Market Reactions to Policy Deliberations on Fair Value Accounting and Impairment Rules During the Financial Crisis of 2008-2009

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Abstract:

Fair value accounting (FVA) has been blamed for amplifying the financial crisis of 2008-2009. We investigate investor and creditor reactions to policymaker deliberations, recommendations and decisions about FVA and impairment rules in the banking industry. If FVA was a key contributor to the financial crisis as some industry pundits and academic research suggest, we first should observe positive stock market reactions to proposals that relax FVA rules and negative reactions when policymakers support FVA. Second, we investigate cross-sectional stock price reactions to bank-specific factors that potentially contributed to pro-cyclical contagion. Third, we examine whether banks that have fewer alternative sources of information about fair values experience relatively negative reactions to potential relaxation of FVA and impairment rules. Finally, we investigate credit market reactions to these policy deliberations, recommendations and decisions by examining changes in credit default swap spreads for a subset of banks in our sample.

Our first result suggests that investors acted as if the potential negative effects of then-existing FVA and impairment rules outweighed any benefits associated with having more timely and transparent mark-to-market data for decision-making. Second, while our cross-sectional test results are mixed, our most robust result suggests that the magnitude of stock price reactions to the relaxation of FVA and impairment rules was positively related to the proportion of banks’ illiquid assets. Third, we provide mixed evidence that banks without analyst coverage (and thus presumably fewer alternative sources about fair values) were harmed by proposals and policies that relaxed FVA and impairment rules. Finally, our results on credit market reactions suggest that positive stock market reactions to the potential relaxation of FVA rules are not likely caused by wealth transfers from creditors to shareholders.

JEL classification: G14, G21, M41

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“In perhaps the most sweeping indictment of fair-value accounting to date, the chairman of the Federal Deposit Insurance Corporation during the 1980s savings-and-loan debacle told the Securities and Exchange Commission today that mark-to-market accounting rules caused the current financial meltdown.” Katz (2008)

1. Introduction

The Financial Accounting Standards Board (FASB) states that a long-term objective is to use fair value (a.k.a., mark-to-market) accounting to measure and report financial instruments (e.g., see Statement of Financial Accounting Standard (SFAS) No. 159). However, critics argue that fair value accounting (FVA) contributed to the worst economic crisis in the United States since the Great Depression (Hughes and Tett 2008; Johnson 2008; Rummell 2008). Speaking at a SEC panel on mark-to-market accounting and the market turmoil following the subprime crisis, William Isaac, chairman of the Federal Deposit Insurance Corporation (FDIC) from 1978 to 1985, blamed FVA for causing the financial meltdown that followed the subprime crisis (Katz 2008).\(^1\) The International Monetary Fund (2008, pg. 127) stated that “investment decision rules based on fair value accounting outcomes could lead to self-fulfilling forced sales and falling prices when valuations fell below important thresholds (either self-imposed by financial institutions or regulation).” Theoretical models by Cifuentes, Ferrucci, and Shin (2005) and Plantin, Shin, and Sapra (2008) show that FVA has the potential of exacerbating contagion among banks (i.e., the spread of market shocks) potentially leading to a breakdown of the entire banking system.\(^2\) Downtoh et al. (2012) document contagion effects of fair value accounting by showing that firms without write-downs related to mortgage backed securities (MBS) and collateralized debt obligations (CDO) exhibit significant negative abnormal returns at the same time as firms that experience write-downs. Others have also questioned whether the FASB’s move towards more fair value reporting meets its objectives of providing useful and cost effective information to investors (e.g., Benston 2008, Bratten et al. 2013). In contrast, several commentators (e.g., Ball 2008, CFA Center for Financial Market Integrity 2008, Ryan 2009) suggest that relaxing FVA rules would lead to less timely and hence less informative disclosures about banks’ financial soundness and, as a result, extend the duration of the financial crisis. Further, Muller III et al. (2011) find that adoption of fair value accounting can reduce information asymmetry across firms.

In this paper, we (i) assume that stock markets were efficient with respect to public information

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\(^1\) Similar views were expressed by Newt Gingrich (Forbes.com, Sept. 29, 2008) and by several participants at the SEC’s October 29, 2008 Roundtable on Mark-to-Market Accounting including Aubrey Patterson (Chairman and CEO of BancorpSouth, Inc.) and Bradley Hunkler (Vice President and Controller of Western & Southern Financial Group).

\(^2\) Pro-cyclical contagion is the process whereby one bank is affected by the actions of another bank. For example, assume that in the recent recession, Bank A is forced to sell assets at fire-sale prices to shore up its regulatory capital. This in turn forces other banks to mark their similar assets to these declining prices, causing some of these otherwise healthy banks to sell assets and curtail lending in an attempt to bolster their regulatory capital. Prices fall further, and the cycle repeats itself exacerbating the crisis.
during the financial crisis of 2008-2009 and (ii) examine whether bank stock prices were affected by events that potentially changed the probability that policymakers would relax (or retain) existing FVA and impairment rules during the crisis. This approximate six-month period of debate about FVA and impairment rules culminated with three FASB staff positions (FSPs) issued on April 9, 2009. These FSPs clarified that FVA and impairment rules need not be applied when markets are illiquid or when transactions are forced by liquidation or distressed sales. In short, this guidance generally relaxed FVA and impairment rules during the financial crisis – see the Appendix for more details on these rule changes.

By examining stock price reactions to policy deliberations and decisions leading to these FSPs, we investigate the link between FVA and contagion and inform the debate about the role of FVA and impairment rules during a period of extreme financial turmoil. We examine whether investors, on balance, believed the alleged negative effects of FVA potentially outweighed the benefits associated with having more timely mark-to-market data for decision-making. We test whether relaxation of FVA and impairment rules appeared to increase bank values during a financial crisis characterized by pro-cyclical contagion. We expect positive (negative) reactions to events that increased (decreased) the probability of FVA or impairment rules being relaxed. Alternatively, if investors on balance perceive that curtailing FVA or impairment rules could mask the underlying economics of banks, we should observe relatively negative reactions to proposals that relax FVA or impairment rules. Thus, we also investigate the role of a bank’s information environment on the stock price reactions to the deliberations leading to the ultimate relaxation of FVA and impairment rules.

We first examine ten event windows leading to the eventual adoption of new FVA and impairment rules. We find that four of seven event windows that signaled an increased probability that existing FVA standards would be relaxed produced significant positive abnormal stock price reactions for sample banks. We find that two of three event windows that signaled a decreased probability of existing FVA standards being relaxed exhibited significant negative abnormal stock returns. We also find a highly significant reaction when we combine all ten events into one event window using an indicator variable

3 This seems plausible given Bowen et al (1989) found that, except for the actual day of the crash, prices appeared to efficiently impound earnings news during the aftermath of the stock market crash of 1987. Note that equity markets can be efficient and liquid while other markets (such as the market for mortgage-backed securities during the financial crisis) can be distressed and illiquid (e.g., see Diamond and Rajan, February 2009, on the credit crunch). Further, consistent with the notion that markets of mortgage-backed securities became distressed and illiquid during the recent financial crisis, Merrill et al. (2012) document that capital constrained insurance companies sold comparable non-agency residential mortgage backed securities at significantly lower prices than other non-constrained insurance companies.

4 While marking impaired assets to market was arguably not required under then-existing FVA and impairment rules, the emphasis in practice was apparently to use the last transaction price or the last quoted price as the primary basis of estimating fair value in SFAS No. 157. The result was marking assets to ‘fire sale’ prices during the crisis. The subsequent FASB staff position, FSP No. FAS 157-4 (April 2009), provided guidance on determining fair value when markets were thin with the aim of avoiding marking assets to distressed fire sale prices – again, see the Appendix for more detail on these rules.
that equals 1 (-1) during each event window assumed to increase (decrease) the probability of suspension/modification of FVA or impairment rules, 0 otherwise. Our initial results suggest that (i) stock market participants viewed FVA and impairment rules to be value-relevant for banks during the recent economic crisis, and (ii) concerns about FVA exacerbating pro-cyclical contagion dominated concerns about the loss of timely fair value information, on average.

Second, we test for a relation between individual bank’s susceptibility to contagion and their stock price reaction to subsequent events that led to relaxation of FVA and impairment rules. We construct a proxy for individual bank sensitivity to contagion by examining banks’ stock price reactions to the collapse of Lehman Brothers in mid-September 2008 – an event that arguably precipitated the financial crisis of 2008-09. Our proxy captures the market’s assessment of bank susceptibility to contagion directly via the broken banking relationships with Lehman Brothers and indirectly via the market’s forecast of the side effects of Lehman’s failure on individual banks and on the banking system in general. We find that our proxy for contagion is weakly associated with stock price reactions to events leading to the relaxation of FVA and impairment rules, i.e., banks that were most sensitive to contagion showed some tendency to exhibit greater benefit from relaxation of FVA and impairment rules.

Third, we identify additional bank-specific factors that potentially contribute to pro-cyclical contagion, including relatively (i) low regulatory capital, (ii) more assets recorded at fair value, (ii) poor asset liquidity, (iv) larger potential impairments, and (v) more trading assets. We find that the magnitude of stock price reactions to the relaxation of FVA and impairment rules was positively related to banks’ illiquid assets and their likelihood of being subject to potential other-than-temporary impairments.

Fourth, we predict that banks with a relatively weak information environment, proxied by the absence of analyst coverage, should experience more negative (or less positive) reactions to the potential loss of fair value information resulting from the relaxation of FVA and impairment rules. Arguably, fair value accounting provides more timely and relevant information (Ball 2008 and Ryan 2009). Thus, if FVA is relaxed or modified, banks with no analyst coverage have fewer alternative sources of timely and relevant information. Consistent with this hypothesis, we find some evidence that banks with no analyst coverage experience smaller positive stock price reactions to the combined ten events leading up to the FASB’s relaxation of FVA and impairment rules.

Finally, we investigate the reaction of creditors to the potential relaxation of FVA and impairment rules by examining changes in credit default swap (CDS) spreads for 16 banks in our sample. We detect some evidence that spreads changed during four of the ten event windows, but these changes do not show a consistent pattern. Nonetheless, our mixed results help us conclude that the positive stock market reactions to potential relaxation of FVA rules were not likely due to wealth transfers from creditors to shareholders.
Our study is among the first to examine the impact of events that affected the probability of FVA rules being modified during a period of extreme market turmoil, the 2008-09 financial crisis.\textsuperscript{5} We believe our study informs the debate about the role of FVA during the crisis.\textsuperscript{6} The FASB had alleged that investors wanted more FVA because it provides more timely and relevant information than the cost-basis model. In contrast, bankers argued that FVA contributed to the credit crisis. On balance, our evidence suggests that investors reacted favorably when regulators and the media discussed relaxation of FVA and impairment rules, as if banks would benefit and pro-cyclical contagion would be reduced. We also provide some evidence that banks that benefited the most were more susceptible to contagion, especially those that had relatively large amounts of illiquid assets that were potentially exposed to being marked down during the crisis.

\textbf{2. Background and hypothesis development}

\textbf{2.1. Fair value accounting in the banking industry}

Accounting serves at least two key functions in the banking industry – an information role common to all public companies in the economy and a contracting role that has unique implications specific to regulated industries such as banking. In its information role, FVA and impairment rules provide analysts and investors information about the current market value and riskiness of key bank assets and liabilities. This information can be especially important when markets are volatile and fair values diverge from their underlying historical costs. In its contracting role, accounting forms the basis for monitoring and contracting with regulatory agencies such as the Federal Reserve and the Federal Deposit Insurance Corporation (FDIC). Especially important are contractual minimum capital requirements defined by accounting numbers.\textsuperscript{7} To the extent markets are volatile and regulators use FVA for both monitoring and

\textsuperscript{5} In a related paper, Bhat, Frankel and Martin (2011) find that fair value accounting exacerbates the feedback effect between the holdings of mortgage backed securities and the underlying asset market. In one of their analyses, for a subset of our event windows, they find that bank stock price reactions to the easing of mark-to-market rules are associated with the intensity of the feedback effect. In contrast, our paper focuses on the entire regulatory/political debate surrounding FVA and impairment rules during the financial crisis. We examine several events and test a number of hypotheses not considered by Bhat et al (2011).

\textsuperscript{6} Our paper is also related to emerging literature on the 2008 financial crisis in general (e.g., Beltratti and Stulz 2009; Diamond and Rajan 2009; Shleifer and Vishny 2009; Acharya, Gale and Yorulmazer 2009) and on the role of FVA in that crisis in particular (Ryan 2009, Laux and Leuz 2009, Sapra 2009). In a time-series analysis spanning 1988-2007, Khan (2013) finds an association between systemic risk and the proportion of the banks’ balance sheet that rely on fair value reporting, particularly during times of market illiquidity. Gartenberg and Serafeim (2009) fail to find a negative association between stock returns of banks during the fourth quarter of 2008 and their holdings of level 1 and level 2 fair value assets and hence conclude that FVA did not exacerbate the financial crisis. None of these papers investigates the stock price reactions associated with policymaker initiatives to relax FVA or impairment rules. Moreover, we exploit cross-sectional variation in banks’ returns to these regulatory events to test fine-grained hypotheses related to the potential consequences of relaxing FVA.

\textsuperscript{7} The Financial Institutions Reform, Recovery and Enforcement Act of 1989 (“FIRREA”) and the Federal Deposit Insurance Corporation Improvement Act of 1991 (“FDICIA”) enacted in the wake of the Savings and Loans scandal prohibits banking regulators from applying regulatory accounting principles that are any less rigorous than GAAP.
contracts, intervention is more likely as banks more frequently hit thresholds that indicate concern about capital adequacy. Barth, Landsman and Wahlen (1995) find that banks violate regulatory capital requirements more frequently under fair value than historical cost regimes, but share prices do not fully reflect this additional regulatory risk.

2.2. Prior Literature on the stock market reaction to FVA rules

Cornett, Rezaee and Tehranian (1996) and Beatty, Chamberlain, and Magliolo (1996) investigate the stock price reaction of bank holding companies around events related to the promulgation of fair value accounting in the early 1990s. Each of these studies concluded that investors expected implementation of SFAS 105, 107, and 115 to decrease bank stock values. Cornett et al. (1996) hypothesize that sample banks' negative stock price responses result from SFAS 115's impact on bond covenants whereas Beatty et al. (1996) focus on both SFAS 115's impact on contracting and on bank regulation. Lys (1996) argues that bank regulation was the more likely cause of investors' negative assessment of the implication SFAS 115 for bank stock prices.

We evaluate the economic consequences of the relaxation of FVA and impairment rules during the financial crisis of 2008-09 – a period in which both the SEC and the FASB faced intense political pressure to relax FVA and impairment rules. This presents an ideal setting to examine the economic consequences associated with relaxing FVA and impairment rules. Moreover, conducting an event study during this crisis enables us to test claims that FVA is less valuable when markets for assets are illiquid. The argument is that inactive illiquid markets make banks pro-cyclical because a write-down of assets by one bank may cause other banks to mark down their assets, which in turn could reduce risk-based capital for all banks that hold similar assets. Some of these otherwise healthy banks with now-impaired capital ratios may be forced to sell assets and curtail lending, further lowering asset prices and exacerbating the financial crisis. In contrast, under historical cost accounting, losses are recognized far more slowly.

Thus, a unique feature of our study is that, unlike the prior literature on FVA (e.g., Barth, Landsman and Wahlen 1995; Beatty, Chamberlain and Magliolo 1995; and Cornett, Rezaee and Tehranian 1996), we conduct an event study around pronouncements related to changes in FVA rules in the midst of a financial crisis. Most of these prior studies examined events in the 1990s when asset markets were liquid and not distressed. Our setting allows us to examine the reactions of equity holders and creditors to the alleged concern that FVA exacerbated contagion and forced firms to mark assets to lower prices in the midst of the recent financial crisis.

2.3. Events that could affect the probability of a change in FVA or impairment rules

The timeline of events leading up to relaxation of FVA and impairment rules in March and April

Further details about the minimum capital requirements for banks and the regulatory action for violating these minimum capital requirements can be found at [http://stlouisfed.org/col/director/materials/alco_capitaladequacy.htm](http://stlouisfed.org/col/director/materials/alco_capitaladequacy.htm)
2009 is summarized in Table 1. Our first event window is the period around the introduction, deliberation and passage of the amended Emergency Economic Stabilization Act of 2008 (EESA). It begins on September 27, the day before the release of an EESA draft which gave the SEC the authority to suspend FVA and required the SEC to conduct a study on the effects of FVA (including impairment rules\(^8\)) within 90-days from the day of the enactment of the Act. Event window 1 ends on October 4, 2008, the day after President Bush signed EESA into law within hours of the House passing the revised version of the bill. Activity leading up to passage of the bill received intense media coverage (with approximately 10,000 cites on Google news and Google blogs – see Table 1); the probability of FVA being relaxed or suspended likely increased during this period.

Event window 2 begins on Monday October 13, 2008 when the International Accounting Standards Board (IASB) issued amendments to International Accounting Standard (IAS) 39 ‘Financial Instruments: Recognition and Measurement,’ and International Financial Reporting Standard (IFRS) 7 ‘Financial Instruments: Disclosures’ that permitted the reclassification of some financial instruments so that banks reporting under IFRS could avoid using fair values in reporting selected financial instruments. The IASB’s Chairman, Sir David Tweedy, acknowledged that the IASB was forced to amend rules due to political pressure. In early October 2008, the IASB received requests to address differences between the reclassification requirements of IAS 39 and US GAAP. Unlike US GAAP, IAS 39 did not permit reclassifications for financial assets classified as held for trading. The Board was asked to consider allowing entities applying IFRS the same ability to reclassify a financial asset out of the held-for-trading category as is permitted by SFAS 115 and SFAS 65. The IASB responded quickly:

“The Board normally publishes an exposure draft of any proposed amendments to standards to invite comments from interested parties. However, given the requests to address this issue urgently in the light of market conditions, and after consultation with the Trustees of the IASC Foundation, the Board decided to proceed directly to issuing the amendments. In taking this exceptional step the Board noted that the amendments to IAS 39 relaxed the existing requirements to provide short-term relief for some entities. The Board also noted that the amendments were a short-term response to the requests and therefore the Board decided to restrict the scope of the amendments.” (IASB 2008)

The second event window ends on October 16, the day after the European Union’s (EU) regulator’s committee voted unanimously to accept IASB’s emergency changes to mark-to-market rules. International FVA rules were clearly relaxed during this event window but given the event did not change the rules for U.S. banks, it likely had little effect on the stock prices of U.S. banks. We include this event for completeness.

\(^8\) In general, impairment rules are intertwined with FVA rules in the deliberations described here and in most of the event windows examined. Hence, testing for the separate implications of relaxing FVA and impairment rules is not feasible.
The third event window is centered on the three days before, during and after the first of two SEC-hosted roundtable discussions of mark-to-market accounting on October 29, 2008. The purpose of the round table discussions was to provide input to the SEC study mandated by the EESA of 2008 (see event window 1). While no formal rules were proposed, most panelists argued that SFAS 157, Fair Value Measurements, should be retained. While far from definitive given the event was a public forum, we interpret the opposition to relaxing FVA accounting rules as likely reducing the probability that FVA would be curtailed.

The fourth event window is centered on the three days before, during and after the second of two SEC-hosted roundtable discussions of mark-to-market accounting on November 21, 2008. While no consensus was reached about the future of mark-to-market rules, Chairman Cox mentioned in his opening remarks that “at a minimum there are areas where fair value accounting could be improved.” While again not definitive given the event was a public forum, the Chairman’s statement that FVA rules “could be improved” likely increased the market’s probability assessment that FVA rules would be relaxed.

The fifth event window is the three days centered on December 30, 2008 – the date the SEC issued its staff study of mark-to-market accounting. The study recommended that SFAS 157 be improved but that existing mark-to-market rules be retained. The staff’s recommendations likely reduced the probability of FVA being suspended by the SEC Board.

The sixth event window is the three days centered on January 12, 2009 – the date the FASB issued FSP EITF 99-20-1, amending impairment guidance of EITF No. 99-20, allowing more managerial judgment in determining other-than-temporary impairments (OTTI). FSP EITF 99-20-1 provided guidance to establish that it is inappropriate to automatically conclude that every decline in fair value represents an OTTI. It required further analysis and allowed managerial judgment to assess whether a decline in fair value suggests an OTTI, thereby allowing for more managerial discretion in recording OTTIs. This event clearly relaxed impairment rules and gave managers the opportunity to avoid some OTTIs.

The seventh event window is the three days centered on February 18, 2009 – the date the FASB announced a project to improve measurement and disclosure of fair value estimates with the specific goal of providing more guidance on determining when a market is active or inactive, when a transaction is

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9 FSP EITF 99-20-1 applies to impairment of interests held by a transferor in a securitization transaction accounted for as a sale and in purchased beneficial interests in securitized financial assets; it aligns the guidance for OTTI under EITF 99-20 with FAS 115. Previously, EITF 99-20 required the use of market participant assumptions about future cash flows in determining OTTIs, not allowing for managerial judgment in the determination of the probability regarding the collection of the previously projected cash flows. Thus, applying EITF 99-20 in an illiquid/distressed market can automatically result in an OTTI when the fair value is less than the cost basis, even though management may have current information suggesting that the underlying assets are still expected to fully perform.
distressed, etc. We interpret the FASB’s continued support for FVA as likely reducing the probability of FVA being suspended by policymakers.

The eighth event window encompasses five days of political activity that supported the relaxation of FVA rules. On March 10, 2009, Federal Reserve Board of Governors Chairman Bernanke, in a speech before the Council of Foreign Relations, said current accounting rules need to be revised so that they do not amplify negative effects of a downturn. On the same day, Rep. Barney Frank echoed Bernanke’s views nudging regulators to explore the possibility of implementing new guidelines for mark-to-market rules. On March 11, Mary Schapiro, SEC Chairwoman, supported changes to FVA rules in testimony to the House Financial Services subcommittee. On March 12, standard setters and regulators were pressed in a House Financial Services subcommittee hearing to alter existing FVA rules immediately. The probability of FVA being relaxed or suspended likely increased during this period.

The ninth window revealed policy decisions about impairment and FVA rules. It is the three days centered on March 16, 2009 – the day the FASB proposed two new staff positions that would relax FVA and impairment rules as described in the Appendix.

The tenth event window is the four days centered on April 1-2, 2009. On April 1, 2009, the Financial Times reported that the FASB was expected to approve changes in FVA and impairment rules proposed on March 16, 2009. The FASB affirmed changes in FVA rules on April 2, 2009.

Table 1 provides data on the number of Google News and Google Blogs cites for each event and event window using search terms available from the authors. We caution the reader not to take the numerical data too literally. Rather, these data provide a sense of the amount of new coverage each step in the policymaking process received.

2.4. Contemporaneous events that may potentially confound our event windows

Other events related to the banking industry and the economy in general may occur simultaneously with the FVA events we study. Consequently, the results we document may be attributable to potentially confounding events, rather than events that signaled likely changes in FVA or impairment rules. Given the process of identifying potentially confounding events is inherently subjective, we use five external sources. Our first source is Ait-Sahalia, Andtritzky, Jobst, Nowak and Tamirisa (2010). Ait-Sahalia et al. (2010) construct a detailed database of macroeconomics and financial sector policy initiatives announced during the crisis in four advanced economies – the United States, the United Kingdom, the euro area and Japan – between June 1, 2007 and March 31, 2009. Our second source is Lev and Zhou (2010) who examine news releases from federal agencies and major media outlets and identify 44 key crisis events between September 1 and December 31, 2008. Third, we identify potentially confounding events from the crisis timeline in Acharya, Philippon, Richardson and Roubini (2009). Finally, we examine two major media outlets to identify any confounding events that might not have been covered by the above three
sources. The two media sources include Wall Street Journal’s timeline of the financial crisis, “Two Years in the Credit Crisis,” and a Washington Post article titled “Timeline: Crisis on Wall Street.” These potentially confounding events are summarized in Table 2.

Our search of these sources identified no important confounding events in windows 6 and 9. Windows 3, 5 and 7 appear to have confounding events, but the impact of these events on bank stock prices is likely to be in the direction opposite to that predicted by FVA related events in these windows. Thus, we label the subset of five event windows 3, 5, 6, 7 and 9 as “clean” in that either (i) we did not identify confounding events or (ii) confounding events worked opposite to our predictions related to changes in FVA and impairment rules. We re-run our analyses using these five relatively clean event windows.

2.5. Overall market reaction to events signaling a change in FVA or impairment rules (H1)

We begin by examining the reaction of bank stocks to the above events that signaled potential changes in FVA or impairment rules. If FVA was harmful to banks in general during this period of economic instability because of increased probability of regulatory intervention or because illiquid assets are inappropriately marked to market, we should observe positive stock price reactions to events that signaled relaxation of FVA rules and negative reactions to announcements that supported current FVA rules. Thus our first overall hypothesis is:

_Hypothesis 1: Events that potentially increase the probability of FVA or impairment rules being relaxed (retained) are associated with significant positive (negative) stock price reactions among banks._

We examine (i) each of the ten (five) event windows listed in Table 1 separately and (ii) an overall event window for all ten (five) event windows aggregated together. We aggregate individual event windows by assigning +1 (-1) to each event window assumed to increase the probability that FVA or impairment rules would be relaxed (retained).

2.6. Do banks that are more susceptible to procyclical contagion have relatively large reactions to events signaling a change in FVA or impairment rules? (H2)

Next, we examine the cross-sectional relation between bank susceptibility to contagion and stock price reactions to events that potentially changed the probability of FVA or impairment rules being relaxed or retained. Credit markets became illiquid during the global economic crisis of 2008-09. Trades not backed by a stable government ceased to exist – except at ‘fire-sale’ prices in an inactive market.11


11 It is important to note that there is no consensus in prior literature on what constitutes a ‘fire-sale’ price and prior studies have only documented evidence that is suggestive of fire sales. However, in our study, the existence and
For example, a bank that needed to improve its regulatory capital ratio might sell its mortgage-backed securities in the inactive open market to move them from assets requiring large amounts of risk-based capital to cash or U.S. Treasuries that required little or no risk-based capital.\textsuperscript{12} Other banks exposed to FVA rules that held similar securities were allegedly more likely to write down their holdings to these significantly lower prices from illiquid markets because of FASB guidance associated with FAS 157, “Fair Value Measurements.”\textsuperscript{13} This in turn could cause capital adequacy ratios of some of these otherwise healthy banks to fall below ‘well-capitalized’ and potentially force these banks to curtail lending and sell assets in the inactive marketplace in an attempt to improve their capital ratios or risk costly regulatory intervention. This ‘pro-cyclical’ contagion allegedly worsened the financial crisis as prices for securities fell and even more banks were forced to react to improve their regulatory capital. We predict that banks that were relatively more exposed to pro-cyclical contagion had stronger positive (negative) reactions to changes in the probability of FVA or impairment rules being relaxed (retained).

\textit{Hypothesis 2: The magnitude of the stock price reactions to events that potentially changed the probability of FVA or impairment rules being relaxed (retained) in the banking industry is relatively positive (negative) for banks that are more susceptible to pro-cyclical contagion.}

Acharya, Pedersen, Philippon and Richardson (2009) argue that the Lehman failure revealed the systemic flaws and interrelationships in the banking industry that could contribute to contagion. Thus, we construct a proxy for individual bank sensitivity to contagion by assigning a scaled rank to each bank based on its stock price reaction to the collapse of Lehman Brothers in September 2008. Our proxy captures the market’s assessment of bank susceptibility to contagion directly via the broken banking relationships with Lehman Brothers and indirectly via the market’s forecast of the side effects of Lehman’s failure on the banking system. We chose this proxy because the Lehman’s collapse was early in the crisis and did not overlap with discussions about modifying FVA or impairment rules. Stock return reactions to Lehman’s collapse are summed from September 12, 2008 through Sep 15, 2008 (where September 13 and 14 are non-trading days). Banks’ stock return reactions are ranked from most negative to most positive and scaled by the total number of banks in the sample (i.e., 288).

Identification of fire sales is not a necessary condition for FVA to exacerbate contagion. FVA can contribute to contagion even in the absence of fire sales to the extent that banks are required (or believe they are required) to write down assets on their balance sheet to lower observed market prices.

\textsuperscript{12} Bhat et al. (2011) and Merill et al. (2012) provide evidence consistent with this argument. Bhat et al. (2011) find that bank with lower total capital ratios tend to reduce their holdings of mortgage backed securities following a decline in the price of such securities. Merill et al. (2012) show that capital-constrained insurance companies sell comparable residential mortgage backed securities at much lower prices than other insurers arguably to improve regulatory capital ratios.

\textsuperscript{13} Technically FAS 157 did not require other banks to mark their assets to fire-sale prices (level 3 assets were not required to be marked to fire-sale prices to begin with). However, the guidance provided by the FASB regarding FAS 157 implicitly conveyed that observable market inputs are preferred over unobservable inputs. Therefore, valuation models in practice tended to base inputs on observable market data, which essentially resulted in marking assets to fire sale prices. See Mortgage Bankers Association (2009).
2.7. Cross-sectional market reactions to events signaling a change in FVA or impairment rules (H3-H8)

Next, we examine the cross-sectional relationship between other specific bank characteristics and the overall market reaction to events that potentially changed the probability of FVA or impairment rules being relaxed or retained. We begin by identifying bank characteristics that potentially contributed to pro-cyclical contagion, including relatively (i) low regulatory capital, (ii) more assets recorded at fair value, (iii) poor asset liquidity, (iv) larger potential impairments, and (v) more trading assets. Finally, we predict that banks with a relatively weak information environment, proxied by the absence of analyst coverage, should experience more negative reactions (or less positive reactions) to the potential loss of fair value information resulting from the relaxation of FVA and impairment rules. Below, we elaborate on each of these cross-sectional explanations for the variation in bank stock returns.

First, we consider the adequacy of banks’ regulatory capital. In December 1991, the U.S. Congress passed the Federal Deposit Insurance Corporation Improvement Act (FDICIA), which emphasized the importance of adequate capital buffers. One key provision of the FDICIA, Prompt Corrective Action (PCA), involved early intervention in problem banks by regulators. PCA aims to resolve banking problems of inadequate capital early and at the minimum cost to the bank insurance fund. PCA uses three major ratios in the assessment of capital adequacy. These three ratios are (i) Tier 1 Risk-Based Capital ratio, (ii) Total Risk-Based Capital ratio and (iii) Tier 1 Leverage ratio.

Based on these ratios, banks are categorized by their regulatory capital into five categories: “well-capitalized,” “adequately capitalized,” “undercapitalized,” “significantly undercapitalized,” or “critically undercapitalized.” Well-capitalized banks are supposed to have sufficient capital to serve as a buffer from market swings. In contrast, market volatility can lead to swings in fair values such that regulatory capital is impaired and regulatory intervention is more likely for banks that are not well-capitalized. Regulatory intervention can result in the dilution of equity values or even takeovers. We hypothesize that banks that are less than “well-capitalized” are more affected by changes in FVA or impairment rules. For example, when banks experience a positive reaction to events that can lead to relaxation of FVA or impairment rules, we expect a larger positive reaction from banks that are relatively poorly capitalized.

*Hypothesis 3: The magnitude of the stock price reactions to events that potentially changed the probability of FVA or impairment rules being relaxed (retained) in the banking industry is relatively positive (negative) for banks that are less than ‘well capitalized.’*

Our proxy for banks that are less than well-capitalized, ‘Not-well-cap,’ is an indicator variable that assumes the value 1 if a bank is not classified as well-capitalized based on its regulatory capital ratios and 0 otherwise. That is, Not-well-cap assumes the value 1 if a bank is classified as adequately capitalized, undercapitalized, significantly undercapitalized, or critically undercapitalized. Not-well-cap equals 0 if a bank is classified as well-capitalized.
Our second cross-sectional hypothesis considers banks’ use of FVA. Banks that have relatively more assets denominated in fair values should experience relatively large positive (negative) reactions to changes in the probability of FVA or impairment rules being relaxed (retained).

**Hypothesis 4:** The magnitude of the stock price reactions to announcements that potentially changed the probability of FVA or impairment rules being curtailed in the banking industry is positively related to the bank’s proportion of fair value assets.

We measure a bank’s proportion of fair value assets, “FV_A to Total A,” as the ratio of assets reported using fair value to the total assets of the bank. Assets reported at fair value include available-for-sale securities, trading assets, loans and leases reported at fair value, other financial assets, and servicing rights reported at fair value.

Third, we consider bank exposure to pro-cyclical consequences of illiquid assets reported at fair value. As discussed above, credit markets became illiquid during the financial crisis of 2008-09. Pro-cyclical contagion allegedly contributed to the financial crisis as prices for securities fell in inactive markets and more banks were exposed to write-downs of their illiquid fair valued assets. We predict that banks with relatively large amounts of illiquid assets reported at fair value were more exposed to pro-cyclical contagion and had stronger reactions to changes in the probability of FVA or impairment rules being relaxed (retained).

**Hypothesis 5:** The magnitude of the stock price reactions to announcements that potentially changed the probability of FVA or impairment rules being curtailed in the banking industry is positively related to the bank’s amount of illiquid fair value assets.

Our measure for the amount of illiquid fair value assets, “Level 2 and 3 FV_A,” is the sum of level 2 and level 3 fair value assets scaled by total assets of the bank. Level 2 assets’ fair values are based on models that use market inputs. So, if these markets are illiquid and not functioning properly and market inputs are used in valuing these assets, the models can result in distressed prices that are much lower than the reported value of these assets. Level 3 assets are the most difficult for banks to measure at fair value – generally because there is no active market for these assets. As a result, unobservable inputs must be used to model their values. The models used to value these assets require a "liquidity risk factor" and the result is valuations that generally are not much different from recent prices from distressed sales in illiquid markets (Mortgage Bankers Association 2009). Benston (2008) points out that per SFAS No. 157, exit values are not supposed to include transaction costs. Yet, several examples provided by the FASB as interpretative guidance to accompany SFAS No. 157 included transaction costs in the determination of the fair value of assets. This tended to occur when the fair values were determined by reference to quoted prices for similar assets, which resulted in assets being marked to even lower fair values in practice. Thus, we predict that firms with a higher proportion of their assets classified as level 2 and level 3 fair value assets are more susceptible to write downs and pro-cyclicality.
Fourth, on March 16, 2009, the FASB proposed a new rule that relaxed the conditions under which a bank would have to report impairment in the value of its non-fair value assets (FSP No. FAS 115-2 and FAS 124-2). To avoid considering an impairment as ‘other-than-temporary’ under the new rules, bank management would be required to assert that (i) it does not have the intent to sell the security and (ii) it is more likely than not that it will not have to sell the security before recovery of its cost basis. Prior to this FASB Staff Position, to avoid an OTTI, management was required to state that it has both the intent and ability to hold an impaired security for a period of time sufficient to allow for any anticipated recovery in fair value. Further, the new rule required that only the impairment related to credit loss be recognized in earnings. Impairment related to all other factors (e.g., liquidity) is to be recognized in other comprehensive income. Relaxation of these rules for recording OTTI leads to the following hypothesis:

_Hypothesis 6: The magnitude of the stock price reactions to events that potentially changed the probability of FVA or impairment rules being relaxed (retained) in the banking industry is especially positive (negative) for banks with relatively large amounts of potentially impaired securities._

Our measure for potentially impaired securities, “BTM_Securities,” is the book-to-market ratio of a bank’s debt-securities portfolio. BTM_Securities equals the sum of amortized cost of held-to-maturity securities and available-for-sale securities scaled by the total fair value of held-to-maturity and available-for-sale securities.

Fifth, we examine the effects of potentially inconsistent application of FVA across banks subject to U.S. GAAP. If an asset is classified as a trading asset, the bank is required to report the asset at fair value on a recurring basis on the balance sheet and recognize any change in fair value in earnings. On the other hand, if the same asset is classified as an available-for-sale security, the bank reports the fair value of the asset on the balance sheet, but changes in fair value are not recognized in earnings unless the impairment is permanent. Thus, similar or even identical assets can have different effects on earnings and regulatory capital depending on their classification as trading versus available-for-sale. Prior to FSP No. FAS 157-4, which provided additional guidance for determining fair value of assets in illiquid markets or distressed transactions, a bank that classified an asset as a trading asset was arguably required to take an instant write-down if the market value of the asset declined even though the new price of the asset was from a distressed sale. On the other hand, a bank that classified the same asset as an available-for-sale security would take a write-down only if the decline in the market value was other-than-temporary. Accordingly, we expect that banks with relatively large amounts of trading assets will have more positive reactions to increases in the probability of FVA rules being relaxed.

_Hypothesis 7: The magnitude of the stock price reactions to events that potentially changed the probability of fair value accounting or impairment rules being relaxed (retained) in the banking industry is especially positive (negative) for banks with relatively more trading assets._
Our measure for the amount of trading assets, “Trading A to Total A,” is total trading assets scaled by total assets of the bank.

Our last cross-sectional factor considers an individual bank’s information environment. FVA arguably provides investors more timely and relevant information about the current market value of banks’ assets and liabilities (Ball 2008, Ryan 2009). This information can be important especially during crises when markets are volatile and there is greater information asymmetry. Relative to cost-basis accounting, strict FVA and impairment rules ought to improve the information environment of banks by increasing transparency and reducing information asymmetry. Assuming improved transparency and less information asymmetry are valuable to investors, we hypothesize:

_Hypothesis 8: The magnitude of the stock price reactions to events that potentially changed the probability of fair value accounting or impairment rules being relaxed (retained) in the banking industry is especially negative (positive) for banks with a relatively weak information environment._

Our proxy for banks’ information environment, “Analyst Coverage,” is an indicator variable that equals one if the bank has at least one IBES analyst providing an earnings estimate in the year prior to the start of our sample period (i.e., over the period September 1, 2007 to August 31, 2008) and zero otherwise. If FVA or impairment rules are relaxed, banks with no analyst coverage have fewer alternative sources of timely and relevant information, which in turn suggests that banks without analyst coverage are likely to have a relatively weak information environment characterized by greater information asymmetry and less transparency.\(^\text{14}\)

3. Methodology

3.1. Stock price reactions

Again, we assume stock prices efficiently impounded public information during the financial crisis of 2008-2009. Bank stock returns are commonly modeled using a two-factor model that controls for the market return and interest rate changes, e.g., see Flannery and James (1984) and Beatty et al. (1996). Therefore, to test H1, we use a two-factor model in which firm-specific returns are regressed on (i) the CRSP equally-weighted daily return, (ii) a variable capturing interest rate changes, and (iii) ten event dummy variables as specified in Table 1:

\[
\text{RET}_i = \alpha_0 + \beta_1 \text{Mkt}_t + \gamma_1 \Delta T-Bill_t + \delta_1 \text{FV}_t + \varepsilon_{it}
\]

where:

- \(\text{RET}_i\) = daily stock return for firm i,
- \(\text{Mkt}_t\) = CRSP equally-weighted daily return,
- \(\Delta T-Bill_t\) = daily change in 3-month Treasury bill secondary market rate,
- \(\text{FV}_t\) = indicator variables that allow for mean shifts in returns on event days.

\(^\text{14}\) However, prior literature has also documented that fair values provide more timely and relevant information only when objective-market determined fair value measures are available. For example, Khurana and Kim (2003) do not find a discernible difference in the informativeness of fair value measures relative to historical cost measures.
Each event window is specified as follows. FV_Window assumes a value of 1 on the day before, the day of, and the day after the event date(s) listed in Table 1. If two or more event periods overlap, the event window extends from the day preceding the first event to the day following the last event. In total, we examine ten event windows leading to the eventual adoption of new FVA and impairment rules. We report results using two different specifications of FV_Window. First, we allow δ₁ to vary by event (FV_Window_n) and report stock price reactions for each event window. Second, we report the stock price reaction for all events aggregated together (FV_Window_Combined) by setting FV_Window equal to 1 (-1) on announcement days assumed to increase (decrease) the probability of suspension/modification of FVA or impairment rules, 0 otherwise. To assess the statistical significance of the stock price reactions, we cluster standard errors by time (i.e., by trading day) to produce robust t-statistics (see Petersen 2009).

3.2. Cross-sectional analysis

As discussed earlier, we also test for cross-sectional variation (hypotheses H2-H8) in banks stock price reactions to deliberations leading to adoption of new FVA and impairment rules. Since cross-sectional dependence in security returns can produce ‘too many’ statistically significant t-values in event studies (Leftwich 1981), we use a procedure suggested by Sefcik and Thomspon (1986). To illustrate how the Sefcik and Thompson (1986) approach works, consider a setting in which the event coefficient, δ₁ (from equation 1), has a constant component and a component that depends on firm-specific characteristics. That is, δ₁ can be expressed as follows:

\[ δ₁ = b₀ + b₁ (\text{Not-well-cap}) + b₂ (FV_A to Total A) + b₃ (\text{Level 2 and 3 FV_A}) + b₄ (BTM_Securities) \\
+ b₅ (Trading_A to Total A) + b₆ (Analyst Coverage) \]  

where:

\begin{align*}
\text{Not-well-cap} &= 1 \text{ if a bank is classified as not “well-capitalized,”} \ 0 \text{ otherwise, i.e., a bank is classified as not well-capitalized for any category worse than “well-capitalized,” including “adequately capitalized,” “undercapitalized” or “significantly undercapitalized” or “critically undercapitalized.”} \\
\text{FV_A to Total A} &= \text{ratio of assets reported at fair value to total assets, i.e., the sum of available-for-sale securities, trading assets, loans and leases reported at fair value, other financial assets and servicing rights reported at fair value, scaled by total assets.} \\
\text{Level 2 and 3 FV_A} &= \text{sum of level 2 and level 3 fair value assets scaled by total assets.}
\end{align*}

15 The advantage of the Sefcik and Thompson (1986) approach is that it yields valid standard errors as it accounts for cross-sectional heteroskedasticity and cross-correlation of the residuals which is likely to occur in the presence of common event windows for all sample firms. An alternate approach is a two-step procedure that involves regressing event period residuals on proxies for the different determinants of cross-sectional variation. However, this approach may yield invalid standard errors.
BTM_Securities = the sum of amortized cost of held-to-maturity securities and available-for-sale securities scaled by the sum of the fair value of held-to-maturity securities and available-for-sale securities.

Trading_A to Total A = Trading assets scaled by total assets.

Analyst Coverage = 1 if a bank has analyst coverage over the 12 months prior to Sep 2009, 0 otherwise.

The Sefcik and Thompson (1986) procedure creates a portfolio for each cross-sectional hypothesis (plus the intercept). Thus, we have seven portfolios constructed from sample firm returns, and time-series regressions in equation (1) are performed using weighted-portfolio returns as the dependent variable. To obtain weighted-portfolio returns we define two matrices: (i) a t x j matrix, R, of returns where t is the number of periods and j the number of firms, and (ii) a j x k matrix, F, where k represents the number of determinants of cross-sectional variation plus the intercept. Finally, we estimate \((F'F)^{-1}FR'\) to get a matrix of weighted-portfolio returns (see Sefcik and Thompson 1986 for a full discussion). The equation below represents the portfolio time-series regressions:

\[
RET_{it} = \alpha_i + \beta_i Mkt_Ret_t + \gamma_i \Delta T-Bill_t + b_i FV_{Window\_Combined},
\]

where \(i\) ranges from one to seven and \(t\) equals the number of trading days in our sample period (i.e., 150).

The significance of a firm-specific characteristic in a cross-sectional regression is assessed by examining the t-statistics of the coefficient on FV_Window_Combined in the above system of equations. For example, to assess whether banks that are not well-capitalized had a more positive stock price reaction to events that signaled an increase in the probability that existing FVA and impairment rules would be modified, we examine whether \(b_1\) in the above system of equations is positive and statistically significant.

3.3. Data sources and sample selection

The sample comprises of all U.S. bank holding companies that file the FR Y-9C report and have financial data available on the Bank Holding Companies Database maintained by the Federal Reserve Bank of Chicago and stock price data on CRSP. These restrictions result in a sample of 299 bank holding companies. For the cross-sectional analysis we require that the bank holding companies have stock price data for the entire sample period, reducing the sample to 288 bank holding companies. The daily three-month U.S. Treasury bill secondary market rate data is obtained from the Federal Reserve Bank of St. Louis.

Our event analysis extends from the beginning of September 2008 to April 3, 2009. The announcements that we have identified as event windows are listed in Table 1. The announcements were identified primarily through a search of Google, Google News, and Google Blogs. To verify that we did not miss important announcements or events, we cross-checked our events with five sources discussed in

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16 In all results reported in the paper, the FV_Window coefficients, \(\delta_1\), examined in our cross-sectional analyses are those from firm-specific regressions of equation (1) with the FV_Window variable defined as FV_Window_Combined.
section 2.4 and the FASB’s chronology of events listed in their project updates. Finally, all our cross-sectional variables are measured before the beginning of our event analysis period.

3.4. Descriptive data

Table 3 presents descriptive data on sample banks. Cost-basis and fair value accounting data are from June 30, 2008 and stock price data are from August 29, 2008. The mean (median) bank had $33.6 ($2.3) billion in total assets, $2.8 ($0.2) billion in book value of equity and $3.2 ($0.2) billion in market value of equity. For each of these measures of size, the mean bank exceeded the 90th percentile, consistent with a relatively few huge national banks dominating the sample. As of the end of June 2008, the cost-basis of held-to-maturity and available-for-sale securities generally exceeded their fair values with mean (median) percentage differences being 1.3% (0.8%) but reaching 3.6% at the 90th percentile (see BTM_Securities). On average, assets recorded at fair value comprised 16.3% of total assets (FV_A to Total A), trading assets were less than 1% (Trading_A to Total A), level 2 plus level 3 fair value assets were 1.4% (Level 2 and 3 FV_A), and 82.6% of banks in our sample were followed by at least one analyst (Analyst Coverage). Sample banks had a mean (median) -2% (-1.8%) return in two trading days surrounding the collapse of Lehman Brothers in September 2008.

4. Results on overall and event-by-event stock price reactions to potential changes in FVA or impairment rules (H1)

Table 4 presents results on the reaction of bank stocks to ten individual events that signaled potential changes in FVA or impairment rules. Each predicted sign in Table 4 assumes that reporting under then-existing FVA and impairment rules was perceived as harmful to most banks during this period of economic instability. Given our events are aligned in calendar time and firms are all in the same industry, we use relatively short windows to better isolate the effects of each event. We acknowledge that, to the extent that the market did not quickly sort out the relative exposure of banks to potential changes in FVA and impairment rules, the entire market reaction may not be captured.

Column 1 of Panel A in Table 4, presents results for each of the 10 individual event windows. The sign of the market reaction was as predicted for nine of the ten events, with event window four (the second SEC-hosted roundtable discussion on FVA) being the only exception. On average, banks had significant positive reactions to four of seven events associated with relaxing FVA or impairment rules and significant negative reactions to two of three events signaling current FVA or impairment rules would be supported. Column 2 of Panel A in Table 4 presents results for the five relatively clean event windows. The sign of the market reaction was significant as predicted for each of these five events.

Panel B of Table 4 presents results on the overall stock market reaction for all event windows aggregated together by assigning +1 (-1) to each event window assumed to increase the probability that FVA or impairment rules would be relaxed (retained). The results for all ten events combined are
reported in column 1. The overall reaction was positive and significant \(p = 0.001\).\(^{17}\) Consistent with the results reported in column 1, we find that the inferences drawn do not change when we restrict our analysis to the five relatively clean windows. The results for the clean windows combined are reported in column 2 and once again the overall reaction is positive and significant \(p < 0.001\). On average, our results suggest that stock market participants viewed changes that relaxed (retained) FVA or impairment rules as positive (negative) for banks. Our results are consistent with stock market participants viewing fair value accounting rules to be value-relevant for banks during financial crisis of 2008-09. Also, if market perceptions capture the underlying economics, then-existing FVA and impairment rules appeared to be perceived as harmful on average to banks during this crisis.

5. Do stock market reactions to fair value announcements vary in the cross-section with individual bank’s susceptibility to contagion? (H2-H8)

Next, we further explore potential contagion among banks during the financial crisis of 2008-09 by considering the relation between bank-specific characteristics and the stock market reaction to deliberations on changes in FVA and impairment rules.

5.1. Overall test of contagion (H2)

In H2, we examine the overall cross-sectional relation between bank susceptibility to contagion and market reactions to events that potentially changed the probability of FVA or impairment rules being relaxed or retained. Recall that we measure individual bank sensitivity to contagion by assigning a scaled rank to each bank based on its stock price reaction to the collapse of Lehman Brothers measured from September 12, 2008 to Sep 15, 2008 (where September 13 and 14 were non-trading days). We assume that banks that had relatively negative stock price reactions to Lehman’s collapse are more susceptible to contagion. We rank individual bank’s stock return reactions from most negative to most positive and scale them by the total number of banks in the sample (i.e., 288) and label this variable ‘Contagion.’

Table 5 presents results on our overall cross-sectional test of the relation between bank susceptibility to contagion and market reactions to events that signaled potential changes in FVA or impairment rules. Table 5 summarizes the estimated coefficients of the signed-mean market reaction (FV_Window_Combined) from two different regressions – one for the intercept and one for Contagion, as described in the methods section. Each of these regressions is a time-series regression with the portfolio weight based on a cross-sectional proxy as a dependent variable, and market return, change in Treasury bill rate and signed-mean as the independent variables. When we consider all event windows in column 1 of Table 5, we find that Contagion is positive as predicted and significant at the 10% level \(p = 0.076\), suggesting that banks more susceptible to contagion are also the ones that would benefit most.

\(^{17}\) Event window 1 is centered around the deliberations and passage of the Emergency Economic Stabilization Act of 2008 (also known as the bailout bill). Since the bill included provisions unrelated to revising FVA or impairment rules, we repeated the analysis excluding event window #1 and the results were qualitatively unchanged.
from relaxation of FVA and impairment rules. However, when we restrict our analysis to the five clean event windows reported in column 2 of Table 5, we find that the coefficient on Contagion is still positive, but is no longer statistically significant at conventional levels ($p = 0.174$). We consider more fine-grained firm-specific factors that potentially contribute to contagion in the next section.

5.2. Components of contagion (H3-H7)

In this section we examine five bank characteristics that potentially contributed to pro-cyclical contagion during the financial crisis of 2008-09. Table 6 summarizes the estimated coefficients of the signed-mean market reaction variable (FV_Window_Combined) from each regression, as described in the methods section. The results of the all ten event-window analysis are reported in column 1 of Table 6. Consistent with H3, we find that the magnitude of stock price reactions to the relaxation of FVA and impairment rules was weakly positively related to banks being less than ‘well capitalized’ as it approaches statistical significance ($p = 0.102$). Perhaps not surprisingly given U.S. GAAP is used for regulatory purposes, concerns about regulatory capital appear to have affected investors’ reactions to potential changes in FVA and impairment rules. Inconsistent with H4, we find no evidence that the ratio of fair value assets to total assets was associated with stronger reactions to changes in FVA and impairment rules. Consistent with H5, we find that market reactions to changes in FVA and impairment rules were positively associated with the amount of illiquid (level 2 plus level 3 fair value) assets subject to being reported at fair value and thus more exposed to pro-cyclical contagion as other banks marked down their assets to lower prices from distressed sales ($p = 0.075$). The results on H4 and H5 compliment the findings of Lev and Zhou (2010) who also find that equity investors of financial firms with greater proportion of level 2 and 3 fair value assets react more negatively to the financial crisis events. Consistent with H6, we find that market reactions to changes in FVA and impairment rules were significantly associated with banks’ likelihood of being subject to other-than-temporary impairments ($p = 0.064$). Finally, inconsistent with H7, we find no evidence that the extent of trading assets was associated with stronger reactions to changes in FVA and impairment rules. In summary, of the five bank characteristics we identify, three are at least marginally significantly in their association with market reactions to potential modifications to FVA or impairment rules: (i) being less than ‘well-capitalized’; (ii) the extent of illiquid assets on their books; and (iii) the likelihood of other-than-temporary impairments.

Column 2 of Table 6 reports the results of examining the components of contagion after restricting the analysis to the five relatively clean event windows. Consistent with H5, we continue to find that market reactions to changes in FVA and impairment rules were positively associated with the proportion of illiquid (level 2 plus level 3 fair value) assets ($p = 0.021$). While the coefficients on the other previously significant variables, not-well-capitalized and likelihood of other-than-temporary impairment, are in the predicted direction, they are no longer statistically significant ($p = 0.369$ and $p = 0.294$, respectively).
5.3. Do investors care about the potential loss of fair value information? (H8)

Next, we investigate whether the potential loss of fair value information harms banks with a relatively weak information environment. We use the absence of professional analyst coverage as a proxy for a weak information environment. In results reported in column 1 of Table 6 for our ten event-window analysis, we find that banks without analyst coverage experience significantly smaller (larger) positive reactions (p = 0.055) to events suggesting relaxation (retention) of then-existing FVA and impairment rules. This is consistent with investors in banks without analyst coverage being concerned about the loss of value-relevant fair value information. Hence, the positive coefficient on analyst coverage can be interpreted as evidence consistent with views that relaxing FVA and impairment rules will lead to less timely and less informative disclosures for at least some banks (e.g., Ball 2008, Ryan 2008, CFA Center for Market Integrity 2008, and Muller III et al. 2011). However, after restricting our analysis to the five clean event windows reported in column 2 of Table 6, the coefficient on Analyst Coverage remains positive, but is no longer statistically significant (p = 0.478).

6. Creditor reactions to potential changes in FVA or impairment rules

Our analyses of stock market reactions discussed above suggests that, overall, stock market participants acted as if the potential negative effects of then existing FVA and impairment rules outweighed any benefits associated with having more timely and transparent fair values for decision making. In this section, we complement our stock return analyses by examining the reaction of creditors to these same events. By comparing the reactions of investors to those of creditors, we are able to provide evidence on whether the positive reaction witnessed in stock prices around relaxation of FVA rules was a result of value enhancement or a result of the transfer of wealth from creditors to shareholders. If the relaxation of then existing FVA and impairment rules allowed shareholders to extract additional rents from creditors, we would expect a positive stock price reaction (as documented above) but a negative reaction by creditors.

To examine the reaction of creditors to the relaxation of FVA and impairment rules, we examine changes in credit default swap (CDS) spreads around policy deliberations and decisions that suggested that the then existing rules might be relaxed or retained. Following prior literature (Jorion and Zhang 2007, King 2009), we use a multi-factor model to estimates abnormal changes in CDS spreads. We include the following factors in our model: (i) change in the CDS market index; (ii) a variable capturing

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18 While the response of creditors to the relaxation of rules could also have been measured using bond spreads, CDS spreads offer several advantages over bond spreads for measuring the response of creditors. CDS are more liquid, require less capital, and are more actively traded than the underlying bonds. Also, CDS spreads are not sensitive to the choice of the benchmark risk-free rate and do not reflect other factors that are not related to default risk, such as tax differences between Treasury and corporate bonds. (Jorion and Zhang 2007; King 2009).
change in the risk-free rate; and (iii) equity market volatility. Accordingly, we estimate the following model:

\[
\text{Ret}_\text{CDS}_t = \alpha_0 + \beta_1 \text{CDX}_t + \gamma_1 \Delta\text{T-Bill}_t + \delta_1 \Delta\text{Vol}_t + \theta_1 \text{FV}_\text{Window}_t + \epsilon_t
\]  

(4)

where:

- \(\text{Ret}_\text{CDS}_t\) = daily change in the level of the CDS spread,
- \(\text{CDX}_t\) = daily change in the CDX market index of Markit,
- \(\Delta\text{T-Bill}_t\) = daily change in 3-month Treasury bill secondary market rate,
- \(\Delta\text{Vol}_t\) = daily change in the implied market volatility of the S&P500 index,
- \(\text{FV}_\text{Window}_t\) = indicator variables that allow for mean shifts in CDS spreads on event days.

The CDS data on individual banks and the CDX market index is from the Markit database. Data on individual bank CDS contracts is the spread on the 5-year contract because these contracts are the most liquid and constitute over 85% of the entire CDS market (Jorion and Zhang 2007). To maintain uniformity in contracts, we only use CDS quotations for senior unsecured debt with a modified restructuring (MR) clause and denominated in US dollars. A CDS contract is included in the sample if it has fewer than 87 missing observations over the period September 2nd, 2008 to April 3rd, 2009.\(^\text{19}\) This results in a sample of CDS contracts written on the debt of 16 unique bank holding companies.\(^\text{20}\) Our sample size is comparable to other studies using CDS spreads of U.S. bank holding companies around our sample period (see King 2009). As for the stock returns tests discussed above, we report results using two specifications of \(\text{FV}_\text{Window}\): (i) \(\text{FV}_\text{Window}_n\) and (ii) \(\text{FV}_\text{Window}_\text{Combined}\). As before, standard errors are clustered by time to produce robust t-statistics.

Table 7 reports the changes in sample bank CDS spreads for ten individual events that signaled potential changes in FVA or impairment rules. Unlike predictions for each event in the stock price event study, we do not have predictions about the direction of change in CDS spreads for each event; ex ante, it is not clear whether relaxation of FVA and impairment rules will result in an increase in value for creditors or a wealth transfer from creditors to shareholders. Therefore, we report two-sided p-values for each of the event windows.

Column 1 of Panel A in Table 7 presents results for each of the 10 individual windows. Out of the ten event windows, there is a significant change in the CDS spreads in four windows (five through eight

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\(^{19}\) In order to retain a decent sample size, we used a natural break in the distribution of missing observations at 87 for all firms with credit default swaps. Most papers (e.g., Jorion and Zhang 2007) restrict the sample to credit default swaps that have at least 50% non-missing observations. Given we have 150 trading days in our sample, 87 is slightly more stringent than using a cutoff based on 50% non-missing observations.

\(^{20}\) In our reported results, we do not restrict the sample to only the most liquid CDS contracts (i.e., contracts with less than 40 days with no change in the spread from the previous trading day). Adding this restriction reduces the sample to CDS contracts of nine banks. However, the inferences drawn using the more restricted sample are the same as those drawn from the larger, less restrictive sample.
shown in bold). However, there is no consistent pattern in the change in CDS spreads in response to the change in the probabilities of FVA rules being relaxed. For example, events during windows six and eight suggested that there was an increased likelihood of the then existing FVA and impairment rules being relaxed. While the CDS spread widened during event window six, it narrowed during event window eight. Similarly, events during windows five and seven suggested that there was a reduced likelihood of FVA and impairment rules being relaxed. While the CDS spread narrowed during event window five, it widened during event window seven. The same inconsistent pattern is observed in the response of CDS spreads in the five relatively clean windows in Column 2 of Panel A in Table 7.

Panel B of Table 7 presents results on the reaction of CDS spreads for all event windows aggregated together by assigning +1 (-1) to each window assumed to increase the probability that FVA or impairment rules will be relaxed (retained). The results for all ten event windows combined are reported in Column 1. Overall, the CDS spreads narrowed during the ten event windows, but the estimated coefficient is not statistically significant at the ten percent level. Similarly, results of the combined clean windows (reported in Column 2) also indicate that, while the CDS spreads narrowed during these five event windows, the estimated coefficient is not statistically significant.

Overall, we fail to find a consistent response in CDS spreads to events signaling a change in the probability of FVA or impairment being relaxed or retained. However, our mixed evidence does suggest that the positive reactions observed in the stock market event study were not caused by wealth transfers from creditors to shareholders. If that were the case, we should have witnessed a consistent widening (narrowing) of CDS spreads around events that suggested that the then existing FVA and impairment rules were likely to be relaxed (retained).

7. Conclusion

The financial crisis of 2008-09 arguably led to a near collapse of the U.S. banking system. Then existing FVA and impairment rules were alleged to contribute to the crisis by exacerbating pro-cyclical contagion by effectively causing some banks to mark down at least some of their assets to lower prices from distressed transactions in illiquid markets. We examine stock market and credit market reactions to policy deliberations and decisions related to FVA and impairment rules during the financial crisis. In doing so, we examine the link between FVA and contagion, and inform the debate about the role of FVA and impairment rules during a period of extreme financial turmoil.

Overall, our stock market results suggest that investors acted as if the potential negative effects of then-existing FVA and impairment rules outweighed any benefits associated with having more timely and hence more transparent mark-to-mark data for decision-making. In cross-sectional tests, we find some weak evidence on the distribution of stock price reactions being consistent with investors worrying about contagion among banks. Further, when we looked at five bank-specific characteristics that could
contribute to contagion, we found robust evidence of the magnitude of stock price reactions to the relaxation of FVA and impairment rules being positively related to the proportion of banks’ illiquid assets. We find mixed evidence for two other bank characteristics: (i) banks being less than ‘well-capitalized,’ and (ii) banks’ likelihood of being subject to other-than-temporary impairments related to the stock price reactions. We also find some mixed evidence that banks with no analyst coverage react less positively to the events that relaxed FVA. This suggests that FVA data are perceived to provide timely and informative disclosures about the banks’ financial soundness when other information sources are less available.

Finally, we investigate the reaction of creditors to the potential relaxation of FVA and impairment rules by examining changes in credit default swap (CDS) spreads for a subset of banks in our sample. While we detect some evidence of spreads changing during four of the ten event windows, these changes do not show a consistent pattern. This result suggests that the positive stock market reactions to potential relaxation of FVA rules discussed above are not due to wealth transfers from creditors to shareholders.

While our research indicates that stock market participants acted as if then-existing FVA and impairment rules harmed banks on average during the financial crisis, it does not address the question, “Which is best – FVA or cost-basis accounting?” Throughout this period, regulatory accounting principles (RAP) largely relied on U.S. GAAP. Hence, one could argue that, had regulators used a separate system of cost-basis RAP, political and market reactions to U.S. GAAP-basis FVA and impairment rules might have been muted. However, research by Hill and Ingram (1989) and Blacconiere et al (1991) reminds us that Savings and Loan companies (S&L) strategically used RAP when it would benefit the firm or management. Under then-existing RAP, S&Ls were permitted a number of accounting devices that seemed to increase their capital, including the ability to record present gains at fair value, but defer losses on securities or loans already sold – a clear departure from GAAP. Hence, decoupling RAP from GAAP may not be a panacea.

Finally, our tests do not necessarily suggest that FVA is ‘worse’ than cost basis accounting for regulatory purposes. As we discussed above, we provide some modest evidence that investors in banks with less access to alternative information sources did not react as enthusiastically to policymakers’ efforts to relax FVA. Hence, it is possible that FVA merely accelerates the price and resource allocation adjustment processes resulting in a relatively speedy return to financial stability.
Appendix

Changes in Fair Value Accounting and Impairment Rules: September 29, 2008 to April 2, 2009

Following the onset of the financial crisis in September 2008, policymakers debated relaxation (versus retention) of then-existing FVA or impairment rules which culminated with three Financial Accounting Standards Board (FASB) staff positions (FSPs) issued on April 9, 2009:

(i). FSP No. FAS 157-4 provided additional guidance for estimating fair value in accordance with SFAS No. 157 when the volume of activity for the asset or liability has decreased significantly. Prior to FSP No. FAS 157-4, many in practice interpreted FASB guidance (in FSP No. FAS 157-3) as emphasizing the use of last transaction price or quoted price as the primary basis for estimating fair value in SFAS 157. This resulted in alleged misapplication of SFAS No. 157, which states that “a fair value measurement assumes that the asset or liability is exchanged in an orderly transaction between market participants to sell the asset or transfer the liability at the measurement date. An orderly transaction is a transaction that assumes exposure to the market for a period prior to the measurement date to allow for marketing activities that are usual and customary for transactions involving such assets or liabilities; it is not a forced transaction (for example, a forced liquidation or distress sale)” (emphasis added in FSP No. FAS 157-4).

(ii). FSP No. FAS 115-2 and 124-2 amended other-than-temporary impairment (OTTI) guidance in U.S. GAAP for debt securities to make the guidance more operational and to improve the disclosure and presentation of OTTI on debt and equity securities in the financial statements. The FASB modified the existing requirements that, to avoid recognizing an OTTI, an investor must assert that it has both the intent and ability to hold a security for a period of time sufficient to allow for an anticipated recovery in its fair value to its amortized cost basis. The new FSP required entities to assess whether the entity (a) has the intent to sell the debt security, or (b) more likely than not will be required to sell the debt security before its anticipated recovery. If either of these conditions is met, the entity must recognize an OTTI. Further, in instances in which a determination is made that an OTTI exists but the entity does not intend to sell the debt security and it is more likely than not that the entity will be required to sell the debt security before the anticipated recovery of its remaining amortized cost basis, the impairment is separated into (a) the amount of the total impairment related to the credit loss, and (b) the amount of the total impairment related to all other factors. The amount of the total OTTI related to credit loss is recognized in earnings and the amount of the total OTTI related to all other factors is recognized in other comprehensive income.

(iii). FSP No. FAS 107-1 and APB 28-1 amended FAS No. 107 and APB Opinion No. 28 to require disclosures about fair value of financial instruments for interim periods as well as in annual financial statements.
REFERENCES


Financial Accounting Standards Board (FASB), April 2009. FSP No. FAS 157-4: Determining fair value when the volume and level of activity for the asset or liability have significantly decreased and identifying transactions that are not orderly. Financial Accounting Standards Board, Norwalk, CT.


Table 1
Events relating to the potential suspension or modification of fair value accounting or impairment rules in the banking industry

<table>
<thead>
<tr>
<th>Event (Window) No.</th>
<th>Date (Day of week)</th>
<th>Description</th>
<th>Source</th>
<th>(\Delta) probability of relaxation of FVA</th>
<th>Google news/blog hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (W1)</td>
<td>9/28/2008 (Sunday)</td>
<td>Draft of Emergency Economic Stabilization Act (EESA) 2008 released which gave SEC the authority to suspend the application of SFAS 157 and asks SEC to conduct a study on mark-to-market accounting standards and impairment rules within 90-days from the day of the enactment of EESA 2008.</td>
<td>EESA 2008 draft dated Sep 28, 2008</td>
<td>Increase</td>
<td>471</td>
</tr>
<tr>
<td>2 (W1)</td>
<td>9/29/2008 (Monday)</td>
<td>Draft EESA 2008 put to vote in the house, but it did not pass.</td>
<td>Wikipedia</td>
<td>Decrease</td>
<td>3845</td>
</tr>
<tr>
<td>3 (W1)</td>
<td>9/30/2008 (Tuesday)</td>
<td>SEC, in conjunction with the FASB, issues clarification and guidance on the application of SFAS 157 and other issues surrounding fair value measurements. SEC stresses that managers could use their own judgment when valuing securities in illiquid markets</td>
<td>SEC Press Release 2008-234</td>
<td>Increase</td>
<td>99</td>
</tr>
<tr>
<td>4 (W1)</td>
<td>10/1/2008 (Wednesday)</td>
<td>On the evening of Oct 1, 2008, the Senate passed a revised version of the EESA 2008.</td>
<td>Wikipedia</td>
<td>Increase</td>
<td>See event 6</td>
</tr>
<tr>
<td>5 (W1)</td>
<td>10/2/2008 (Thursday)</td>
<td>Financial Accounting Foundation (FAF) expresses deep concerns about efforts of some to legislate the suspension of SFAS 157 in a letter to the Chairman of the Committee on Financial Services, Barney Frank. FAF urges Congress to make changes to SFAS 157 through FASB’s open due process and to reject any proposals that would threaten the independent process for establishing standards.</td>
<td>FAF letter</td>
<td>Decrease</td>
<td>3</td>
</tr>
<tr>
<td>6 (W1)</td>
<td>10/3/2008 (Friday)</td>
<td>The House passed the revised version of the EESA. President Bush signed the bill into law within hours of the vote.</td>
<td>Wikipedia</td>
<td>Increase</td>
<td>5604 (Events 4 and 6 combined)</td>
</tr>
<tr>
<td>7 (W2)</td>
<td>10/13/2008 (Monday)</td>
<td>International Accounting Standards Board (IASB) issued amendments to IAS 39 and IFRS 7 that permitted the recategorisation of some financial instruments that would allow banks to avoid using FV in reporting financial instruments. Sir David Tweedy acknowledges that IASB was forced to amend rules due to political pressure.</td>
<td>IASB new release</td>
<td>Increase</td>
<td>7</td>
</tr>
<tr>
<td>8 (W2)</td>
<td>10/15/2008 (Wednesday)</td>
<td>EU regulator’s committee votes unanimously to accept IASB’s emergency changes made to mark-to-market rules.</td>
<td>Financial Times</td>
<td>Increase</td>
<td>6</td>
</tr>
<tr>
<td>9 (W3)</td>
<td>10/29/2008 (Wednesday)</td>
<td>SEC hosts round table discussion on mark-to-market accounting. Articles indicate that several suggestions about improvements to FAS 157 were made but SEC did not indicate leaning towards a less restrictive interpretation of FAS 157 (see Proskauer Rose LLP client alert, pg 3 last paragraph). The update about the roundtable on</td>
<td>Multiple client newsletters</td>
<td>Decrease</td>
<td>19</td>
</tr>
</tbody>
</table>

\(^{21}\) FAF is an independent, private-sector organization responsible for oversight of the FASB and is committed to protecting investor interests through protecting the independence and integrity of the standard-setting process.
www.securitization.net says that SEC did not indicate what future course of action it is considering.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Description</th>
<th>Source</th>
<th>Change</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>11/21/2008 (Friday)</td>
<td>SEC held its second roundtable discussion on mark-to-market accounting. No consensus about what the future of mark-to-market rules will be. Though in his opening remarks Chairman Cox mentioned that “at a minimum there are areas where FV accounting could be improved.” (FEI article)</td>
<td><a href="http://www.marketwatch.com">www.marketwatch.com</a></td>
<td>Increase</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>12/30/2008 (Tuesday)</td>
<td>The SEC issued its staff study of mark-to-market accounting. The study recommended that SFAS 157 should be improved but that existing mark-to-market rules not be suspended.</td>
<td>SEC report and CFO.com</td>
<td>Decrease</td>
<td>71</td>
</tr>
<tr>
<td>12</td>
<td>1/12/2009 (Monday)</td>
<td>FASB issued FSP EITF 99-20-1, amending impairment guidance of EITF Issue No. 99-20 and only applies to impairment of interests held by a transferor in a securitization transaction accounted for as a sale and in purchased beneficial interests in securitized financial assets. Allows for more managerial judgment in determining other-than-temporary impairments. FSP EITF 99-20-1 aligns the guidance for OTTI under EITF 99-20 with FAS 115. See pg. 2 of FSP EITF 99-20-1 for differences in the guidance for estimating OTTIs between EITF 99-20 and FAS 115.</td>
<td>FASB website</td>
<td>Increase</td>
<td>10</td>
</tr>
<tr>
<td>13</td>
<td>2/18/2009 (Wednesday)</td>
<td>FASB initiates project to improve measurement and disclosure of FV estimates. The FASB expressed continued support for mark-to-market accounting but planned to provide more guidance on determining when a market is active or inactive, when a transaction is distressed, etc.</td>
<td>FASB press release</td>
<td>Decrease</td>
<td>26</td>
</tr>
<tr>
<td>14</td>
<td>3/10/2009 (Tuesday)</td>
<td>Bernanke in a speech before the Council of Foreign Relations said current accounting rules need to be revised so that they do not amplify negative effects of a downturn. Rep. Barney Frank echoed Bernanke’s views nudging regulators to explore the possibility of implementing new guidelines for mark-to-market rules.</td>
<td>Washington Post</td>
<td>Increase</td>
<td>75</td>
</tr>
<tr>
<td>15</td>
<td>3/11/2009 (Wednesday)</td>
<td>In a testimony to the House Financial Services subcommittee, Mary Schapiro, SEC Chairwoman, supported changes to mark-to-market rules.</td>
<td>CFO.com</td>
<td>Increase</td>
<td>10</td>
</tr>
<tr>
<td>16</td>
<td>3/12/2009 (Thursday)</td>
<td>In a House Financial Services subcommittee hearing standard setters and regulators were pressed hard to alter existing fair value accounting rules immediately.</td>
<td>CFO.com</td>
<td>Increase</td>
<td>121</td>
</tr>
<tr>
<td>17</td>
<td>3/16/2009 (Monday)</td>
<td>FASB proposes guidance on how to determine whether an asset’s market can be considered not active, whether a transaction being used to estimate an asset’s value is distressed. FASB issues two FASB Staff Positions (FSP) giving guidance on when markets are illiquid and OTTI.</td>
<td>FASB press release and CFO.com</td>
<td>Increase</td>
<td>59</td>
</tr>
<tr>
<td>18</td>
<td>4/1-/4/2/2009 (Wednesday-Thursday)</td>
<td>FASB affirms change in FV rules on April 2, 2009. FT reported that FASB is expected to approve change in FV rules on April 1, 2009. News release about the final staff positions is dated Apr 9, 2009.</td>
<td>Financial Times</td>
<td>Increase</td>
<td>282</td>
</tr>
</tbody>
</table>

Notes to Table 1:
FSP EITF = FASB Staff Position Emerging Issues Task Force
OTTI = other-than-temporary-impairments

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Table 2
Identifying potentially confounding events within the ten event windows in Table 1

<table>
<thead>
<tr>
<th>Event Window (Predicted Market Reaction)</th>
<th>Dates</th>
<th>Potentially Confounding Event(s)</th>
<th>Direction of Market Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1 (+)</td>
<td>09/27/08 to 10/04/08</td>
<td>09/25 - WAMU is closed by OTS.</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09/28 - TARP recapitalization of nine US banks.</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09/29 - Hypo Real Estate rescue, Ad hoc bank bailout of Bradford and Bingley as well as Fortis.</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09/30 - Irish Government Guarantee Scheme, Ad hoc bank bailout of Dexia</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09/30 - Net Bank fails.</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/02 - Policy rates maintained by ECB.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/03: EESA is passed, UK long-term repo with expanded collateral, Enhancement of depositor protection in UK.</td>
<td>+</td>
</tr>
<tr>
<td>W2 (+)</td>
<td>10/12/08 to 10/16/08</td>
<td>10/12 - The Federal Reserve Board announced its approval of an application by Wells Fargo to acquire Wachovia</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/13 - French loan guarantees, UK support package details are announced and Euro zone announced coordinated measures to provide liquidity to the US dollar.</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/14 - US Temporary Liquidity Guarantee Program: US govt. announces capital purchase program of up to $250B</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15 - ECB announced expansion of the collateral framework</td>
<td>+</td>
</tr>
<tr>
<td>W3 (-)</td>
<td>10/28/08 to 10/30/08</td>
<td>10/28 - The U.S. Treasury Department purchased a total of $125 billion in preferred stock in nine US banks under the Capital Purchase Program of TARP</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/29 - Federal Reserve cut the key federal funds rate by 50 basis points to 1.00 percent, the Treasury and FDIC announced that they are crafting a plan to provide government guarantee to almost 3 million homeowner mortgages.</td>
<td>+</td>
</tr>
<tr>
<td>W4 (+)</td>
<td>11/20/08 to 11/22/08</td>
<td>11/20 - Fannie Mae and Freddie Mac declared that they will suspend mortgage foreclosures until Jan, 2009.</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11/21 - FDIC seized three banks, Timothy Geithner is elected as the Treasury Secretary.</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11/21 – The US Treasury Department purchased a total of $3 billion in preferred stocks in 23 US banks under the Capital Purchase Program.</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11/23 and 11/24 – Citigroup rescue announced.</td>
<td>+</td>
</tr>
<tr>
<td>W5 (-)</td>
<td>12/29/08 to 12/31/08</td>
<td>12/29-12/30: US Treasury Department announced that it will purchase $5 billion in preferred stock from GMAC as part of its program to assist domestic automotive industry.</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12/31 - The US Treasury Department purchased a total of $1.91 billion in preferred stock from seven US banks under the CPP.</td>
<td>+</td>
</tr>
<tr>
<td>W6 (+)</td>
<td>01/11/09 to 01/13/09</td>
<td>No confounding events identified.</td>
<td></td>
</tr>
<tr>
<td>W7 (-)</td>
<td>02/17/09 to 02/19/09</td>
<td>02/19 - Obama announced a plan, which could cost as much as $275 billion, aimed at enabling</td>
<td>+</td>
</tr>
</tbody>
</table>
as many as five million homeowners who have little equity in their homes to refinance loans through Fannie Mae and Freddie Mac, Bank of Japan announced purchase of corporate financing instruments.

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Event Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>W8 (+)</td>
<td>03/09/09 to 03/13/09</td>
<td>03/13 - The Federal Reserve announced that the target range for the Federal Funds rate will remain at 0 to 0.25%.</td>
<td>+</td>
</tr>
<tr>
<td>W9 (+)</td>
<td>03/15/09 to 03/17/09</td>
<td>No confounding events identified.</td>
<td></td>
</tr>
<tr>
<td>W10 (+)</td>
<td>03/31/09 to 04/03/09</td>
<td>04/01 - Sheila Blair called for a new system of regulation for big financial institutions deemed to be high risk and included raising their capital requirements.</td>
<td>+/-</td>
</tr>
</tbody>
</table>

Notes to Table 2:
Sources include:
- Ait-Sahalia, Andritzky, Jobst, Nowak and Tamirisa (2010)
- Lev and Zhou (2010)
- Acharya, Philippon, Richardson and Roubini (2009)
- Wall Street Journal timeline of the financial crisis, “Two Years in the Credit Crisis”
- Washington Post article, “Timeline: Crisis on Wall Street”
Table 3

Descriptive statistics for sample banks

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>10th %tile</th>
<th>25th %tile</th>
<th>75th %tile</th>
<th>90th %tile</th>
<th>N</th>
<th>Std dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets (in $1000s)</td>
<td>33,634,107</td>
<td>2,273,479</td>
<td>669,397</td>
<td>1,002,950</td>
<td>6,351,986</td>
<td>17,495,472</td>
<td>288</td>
<td>197,160,629</td>
</tr>
<tr>
<td>Book Value of Equity (in $1000s)</td>
<td>2,810,203</td>
<td>188,011</td>
<td>61,067</td>
<td>86,346</td>
<td>567,126</td>
<td>1,891,705</td>
<td>288</td>
<td>15,274,996</td>
</tr>
<tr>
<td>Market Value of Equity (in $1000s)</td>
<td>3,202,507</td>
<td>191,301</td>
<td>45,991</td>
<td>83,891</td>
<td>683,173</td>
<td>2,367,354</td>
<td>288</td>
<td>15,142,726</td>
</tr>
<tr>
<td>BTM_Securities</td>
<td>1.013</td>
<td>1.008</td>
<td>0.994</td>
<td>1.001</td>
<td>1.019</td>
<td>1.036</td>
<td>288</td>
<td>0.022</td>
</tr>
<tr>
<td>Not Well-Cap</td>
<td>0.448</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>288</td>
<td>0.498</td>
</tr>
<tr>
<td>FV_A to Total A</td>
<td>0.163</td>
<td>0.146</td>
<td>0.051</td>
<td>0.093</td>
<td>0.215</td>
<td>0.289</td>
<td>288</td>
<td>0.114</td>
</tr>
<tr>
<td>Trading_A to Total A</td>
<td>0.005</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.008</td>
<td>288</td>
<td>0.027</td>
</tr>
<tr>
<td>Level 2 and 3 FV_A</td>
<td>0.014</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.010</td>
<td>288</td>
<td>0.077</td>
</tr>
<tr>
<td>Analyst Coverage</td>
<td>0.826</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>288</td>
<td>0.379</td>
</tr>
<tr>
<td>Contagion_Ret</td>
<td>-0.020</td>
<td>-0.018</td>
<td>-0.070</td>
<td>-0.043</td>
<td>0.005</td>
<td>0.031</td>
<td>288</td>
<td>0.046</td>
</tr>
<tr>
<td>Mkt_Ret</td>
<td>-0.001</td>
<td>-0.001</td>
<td>-0.041</td>
<td>-0.022</td>
<td>0.021</td>
<td>0.038</td>
<td>150</td>
<td>0.032</td>
</tr>
<tr>
<td>∆T-Bill (in %)</td>
<td>-0.010</td>
<td>-0.010</td>
<td>-0.105</td>
<td>-0.030</td>
<td>0.020</td>
<td>0.055</td>
<td>150</td>
<td>0.139</td>
</tr>
</tbody>
</table>

Notes to table 3:
Accounting data are from June 30, 2008 and stock price data are from August 29, 2008.
Total Assets = Total assets in thousands of U.S. dollars
Book Value of Equity = Book value of equity in thousands of U.S. dollars
Market Value of Equity = Market value of equity in thousands of U.S. dollars
BTM_Securities = the sum of amortized cost of held-to-maturity securities and available-for-sale securities scaled by the sum of the fair value of held-to-maturity securities and available-for-sale securities
Not-well-cap = 1 if a bank is classified as not “well-capitalized,” 0 otherwise, i.e., a bank is classified as not well-capitalized for any category worse than well-capitalized, including “adequately capitalized,” “undercapitalized” or “significantly or critically undercapitalized”
FV_A to Total A = ratio of assets reported at fair value to total assets, i.e., the sum of available for sale securities, trading assets, loans and leases reported at fair value, other financial assets and servicing rights reported at fair value, scaled by total assets
Trading_A to Total A = Trading assets scaled by total assets
Level 2 and 3 FV_A = The sum of level 2 and level 3 fair value assets scaled by total assets
Analyst Coverage = 1 if a bank has analyst coverage over the 12 months prior to Sep 2009, 0 otherwise
Contagion_Ret = Total return upon the collapse of Lehman Brothers (Sep 12, 2009 to Sep 15, 2009)
Mkt_Ret = CRSP equally-weighted daily return over the sample period (Sep 1, 2009 to Apr 3, 2009)
∆T-Bill = Daily change in 3-month Treasury bill secondary market rate in percent over the sample period (Sep 1, 2009 to Apr 3, 2009)
Table 4

What are stock market reactions to announcements related to potential modification or suspension of fair value or impairment accounting rules? (H1)

Panel A: Market Reactions to individual event windows \( (n = 44,117; \text{R-square} = 0.18 \text{ for overall sample}; n = 38,237; \text{R-square} = 0.17 \text{ for clean sample}) \)

Regression results below are calculated using ten (10) event windows centered on key announcements during the period from Aug 29, 2008 to Apr 3, 2009 related to suspension/modification of Fair Value accounting rules for banks.

Model: \( \text{RET}_t = \alpha_0 + \beta_1 \text{Mkt}_{-}\text{Ret}, + \gamma_1 \Delta T\text{-Bill}, + \delta_1 \text{FV}_-\text{Window}_t + \epsilon_t \)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Event date range</th>
<th>Predicted Sign</th>
<th>(1) All windows</th>
<th>(2) ‘Clean’ windows</th>
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<tr>
<td></td>
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<td>Coeff.</td>
<td>t-stat</td>
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<tr>
<td>Intercept</td>
<td>--</td>
<td>--</td>
<td>-0.0006</td>
<td>-0.37</td>
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<tr>
<td>Mkt_Ret</td>
<td>--</td>
<td>+</td>
<td>1.0339</td>
<td>15.67</td>
</tr>
<tr>
<td>ΔT-Bill</td>
<td>--</td>
<td>-</td>
<td>-0.0174</td>
<td>-1.23</td>
</tr>
<tr>
<td>FV_Window 1</td>
<td>9/27/08 to 10/4/08</td>
<td>+</td>
<td>0.0144</td>
<td>2.75</td>
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<td>FV_Window 2</td>
<td>10/12/08 to 10/16/08</td>
<td>+</td>
<td>0.0078</td>
<td>0.46</td>
</tr>
<tr>
<td>FV_Window 3</td>
<td>10/28/08 to 10/30/08</td>
<td>-</td>
<td>-0.0109</td>
<td>-1.24</td>
</tr>
<tr>
<td>FV_Window 4</td>
<td>11/20/08 to 11/22/08</td>
<td>+</td>
<td>-0.0037</td>
<td>-0.29</td>
</tr>
<tr>
<td>FV_Window 5</td>
<td>12/29/08 to 12/31/08</td>
<td>-</td>
<td>-0.0042</td>
<td>-1.63</td>
</tr>
<tr>
<td>FV_Window 6</td>
<td>1/11/09 to 1/13/09</td>
<td>+</td>
<td>0.0029</td>
<td>1.72</td>
</tr>
<tr>
<td>FV_Window 7</td>
<td>2/17/09 to 2/19/09</td>
<td>-</td>
<td>-0.0090</td>
<td>-2.10</td>
</tr>
<tr>
<td>FV_Window 8</td>
<td>3/9/09 to 3/13/09</td>
<td>+</td>
<td>0.0170</td>
<td>2.20</td>
</tr>
<tr>
<td>FV_Window 9</td>
<td>3/15/09 to 3/17/09</td>
<td>+</td>
<td>0.0119</td>
<td>3.57</td>
</tr>
<tr>
<td>FV_Window 10</td>
<td>3/31/09 to 4/3/09</td>
<td>+</td>
<td>0.0032</td>
<td>0.88</td>
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</tbody>
</table>

Notes to Table 4 on next page
What are stock market reactions to announcements related to potential modification or suspension of fair value or impairment accounting rules? (H1)

Panel B: Overall Market Reaction after combining individual event windows into a single signed event window (n = 44,117; R-square = 0.17 for overall sample; n = 38,237; R-square = 0.17 for clean sample)

Regression results below are calculated after combining the individual windows in Panel A centered on key announcements during the period from Aug 29, 2008 to April 3, 2009 related to suspension/ modification of Fair Value accounting rules for banks. Events with a predicted negative sign are multiplied by -1 to produce a consistent positive-signed combined event.

Model: \( R_{it} = \alpha_0 + \beta_1 \text{Mkt}_t + \gamma_1 \Delta T-\text{Bill}_t + \delta_1 FV_\text{Events}_t + \epsilon_{it} \)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Event date range</th>
<th>Predicted Sign</th>
<th>((1)) All windows</th>
<th>((2)) ‘Clean’ windows</th>
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<td></td>
<td></td>
<td>Coeff.</td>
<td>t-stat(^b)</td>
</tr>
<tr>
<td>Intercept</td>
<td>--</td>
<td>--</td>
<td>-0.0005</td>
<td>-0.35</td>
</tr>
<tr>
<td>Mkt_Ret</td>
<td>--</td>
<td>+</td>
<td>1.0376</td>
<td>16.30</td>
</tr>
<tr>
<td>(\Delta T)-Bill</td>
<td>--</td>
<td>-</td>
<td>-0.0178</td>
<td>-1.31</td>
</tr>
<tr>
<td>FV_Events_Combined</td>
<td>8/29/08 to 4/3/09</td>
<td>+</td>
<td>0.0089</td>
<td>3.13</td>
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</table>

Notes to Table 4:
\(^a\) Individual events and event windows are described in Table 2. Event dates ending on a weekend day are truncated to the subsequent day if it is the first date in the range or to the prior day if it is the last date in the range.
\(^b\) t-statistics are clustered by date to control for cross-sectional correlation.
\(^c\) P-values are one-sided for variables with directional predictions, two-sided otherwise. Coefficients on treatment variables that are significant at less than the 10% level are shown in \textbf{bold}. We report \((1 - (p/2))\) values for coefficients that assume a sign opposite to the one predicted.

Definition of variables:
\(R_{it}\) = cumulative raw return for bank ‘i’ on the range of dates specified for event ‘e,’ e.g., for event 1, the cumulative raw return for bank ‘i’ for the period 9/28/08 through 10/3/08 is \(R_{i1}\).
\(\text{Mkt}_t\) = equally weighted return from CRSP, a portfolio of all publicly held U.S. stocks.
\(\Delta T\)-Bill = change in the daily 3-month U.S. Treasury-bill secondary market rate. Source is Federal Reserve of St. Louis.
\(FV_\text{Window}_n\) = an indicator variable that equals 1 during each event window assumed to increase or decrease the probability of suspension/modification of FVA or impairment rules, 0 otherwise. Event window days are specified in table 2.
\(FV_\text{Events}_\text{Combined}\) = an indicator variable that equals 1 (-1) for all combined event window days assumed to increase (decrease) the probability of suspension/modification of FVA or impairment rules, 0 otherwise.
Table 5

Do stock market reactions to fair value announcements vary in the cross-section with individual bank’s susceptibility to contagion? (H2)

Regression results below are based on returns in the combined event window from key announcements during the period from Aug 29, 2008 to April 3, 2009 related to the suspension or modification of Fair Value accounting rules for banks. The estimated coefficients and p-values are based on Sefcik and Thompson (1986) weighted portfolio approach where the weights are based on the variables in the first column. Events with an expected negative sign are multiplied by -1 to produce a consistent positive-signed combined event. Model: \( Ab\_RET_i = \beta_0 + \beta_1 \text{Contagion}_i + \epsilon \)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Predicted Sign(^a)</th>
<th>(1) All windows</th>
<th>(2) ‘Clean’ windows</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-stat</td>
<td>p-value(^b)</td>
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<tr>
<td>Intercept</td>
<td>--</td>
<td>0.1505</td>
<td>2.12</td>
</tr>
<tr>
<td>Contagion</td>
<td>+</td>
<td>0.2849</td>
<td>1.44</td>
</tr>
</tbody>
</table>

Notes to Table 5:
\(^a\) Individual events and event windows are described in Table 2.  
\(^b\) P-values are one-sided for variables with directional predictions, two-sided otherwise. Coefficients on treatment variables that are significant at less than the 10% level are shown in **bold**. We report \(1 - (p/2)\) values for coefficients that assume a sign opposite to the one predicted.

Definition of variables:
\( Ab\_RET_i \) = cumulative abnormal return for bank \( i \) for the combined range of dates across all events described in Table 1.  
Contagion = the scaled rank assigned to each bank based on its stock price reaction to the collapse of Lehman Brothers in September 2008. Stock return reactions to Lehman’s collapse are summed from September 12, 2008 to Sep 15, 2008 (where September 13 and 14 are non-trading days). Bank’s stock return reactions are ranked from most negative to most positive and scaled by the total number of banks in the sample (i.e., 288).
Table 6

Do stock market reactions to fair value announcements vary in the cross-section with likely determinants of bank contagion? (H3-H8)

Regression results below are based on returns in the combined event window from key announcements during the period from Aug 29, 2008 to April 3, 2009 related to the suspension or modification of Fair Value accounting rules for banks. The estimated coefficients and p-values are based on Sefcik and Thompson (1986) weighted portfolio approach where the weights are based on the variables in the first column. Events with an expected negative sign are multiplied by -1 to produce a consistent positive-signed combined event.

Model: \( \text{Ab\_RET}_i = \beta_0 + \beta_1 \text{Not-well-cap}_i + \beta_2 \text{FV\_A to Total A}_i + \beta_3 \text{Level 2 and 3 FV\_A}_i + \beta_4 \text{BTM\_Securities}_i + \beta_5 \text{Trading\_A to Total A}_i + \beta_6 \text{Analyst Coverage}_i + \epsilon \)

<table>
<thead>
<tr>
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<td></td>
<td>Coeff.</td>
<td>t-stat</td>
</tr>
<tr>
<td>Intercept</td>
<td>--</td>
<td>-2.2945</td>
<td>-1.43</td>
</tr>
<tr>
<td>Not-well-cap</td>
<td>H3/+</td>
<td>0.0657</td>
<td>1.27</td>
</tr>
<tr>
<td>FV_A to Total A</td>
<td>H4/+</td>
<td>0.0383</td>
<td>0.60</td>
</tr>
<tr>
<td>Level 2 and 3 FV_A</td>
<td>H5/+</td>
<td>0.7237</td>
<td>1.45</td>
</tr>
<tr>
<td>BTM_Securities</td>
<td>H6/+</td>
<td>2.2850</td>
<td>1.53</td>
</tr>
<tr>
<td>Trading_A to Total A</td>
<td>H7/+</td>
<td>-1.715</td>
<td>-0.99</td>
</tr>
<tr>
<td>Analyst Coverage</td>
<td>H8/?</td>
<td>0.2867</td>
<td>1.93</td>
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</tbody>
</table>

Notes to Table 6:

a Individual events and event windows are described in Table 2.
b P-values are one-sided for variables with directional predictions, two-sided otherwise. Coefficients on treatment variables that are significant at less than the 10% level are shown in bold. We report \((1 - \frac{p}{2})\) values for coefficients that assume a sign opposite to the one predicted.

Definition of variables:

\(\text{Ab\_RET}_i\) = cumulative abnormal return for bank \(i\) for the combined range of dates across all events.

Not-well-cap = 1 if a bank is classified as not “well-capitalized,” 0 otherwise, i.e., a bank is classified as not well-capitalized for any category worse than well-capitalized, including “adequately capitalized,” “undercapitalized” or “significantly or critically undercapitalized.”

FV\_A to Total A = ratio of assets reported at fair value to total assets, i.e., the sum of available for sale securities, trading assets, loans and leases reported at fair value, other financial assets and servicing rights reported at fair value, scaled by total assets.

Level 2 and 3 FV\_A = The sum of level 2 and level 3 fair value assets scaled by total assets.

BTM\_Securities = the sum of amortized cost of held-to-maturity securities and available-for-sale securities scaled by the sum of the fair value of held-to-maturity securities and available-for-sale securities.

Trading\_A to Total A = Trading assets scaled by total assets.

Analyst Coverage = 1 if a bank has analyst coverage over the 12 months prior to Sep 2009, 0 otherwise.
Table 7

What are credit market reactions to announcements related to potential modification or suspension of fair value or impairment accounting rules?

Panel A: CDS spread reactions to individual event windows\(^a\) (\(n = 2,149\); R-square = 0.07 for overall sample; R-square = 0.06 for clean sample)

Regression results below are calculated using ten (10) event windows centered on key announcements during the period from Aug 29, 2008 to Apr 3, 2009 related to suspension/modification of Fair Value accounting rules for banks.

Model: \(\text{Ret}_{CDS_t} = \alpha_0 + \beta_1 \text{CDX}_{Ret} + \gamma_1 \Delta T\text{-Bill}_t + \delta_1 \Delta \text{Vol}_t + \theta_1 \text{FV\_Window}_t + \epsilon_{it}\)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Event date range(^a)</th>
<th>Predicted Sign(^b)</th>
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<th>(2) ‘Clean’ windows</th>
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<td>t-stat(^b)</td>
</tr>
<tr>
<td>Intercept</td>
<td>--</td>
<td>--</td>
<td>0.009</td>
<td>2.92</td>
</tr>
<tr>
<td>CDX_Ret</td>
<td>--</td>
<td>+</td>
<td>0.237</td>
<td>1.99</td>
</tr>
<tr>
<td>ΔT-Bill</td>
<td>--</td>
<td>-</td>
<td>-0.007</td>
<td>-2.75</td>
</tr>
<tr>
<td>ΔVol</td>
<td>--</td>
<td>+</td>
<td>0.081</td>
<td>1.27</td>
</tr>
<tr>
<td>FV_Window 1</td>
<td>9/27/08 to 10/4/08</td>
<td>+/-</td>
<td>-0.002</td>
<td>-0.08</td>
</tr>
<tr>
<td>FV_Window 2</td>
<td>10/12/08 to 10/16/08</td>
<td>+/-</td>
<td>-0.074</td>
<td>-1.55</td>
</tr>
<tr>
<td>FV_Window 3</td>
<td>10/28/08 to 10/30/08</td>
<td>+/-</td>
<td>-0.006</td>
<td>-0.69</td>
</tr>
<tr>
<td>FV_Window 4</td>
<td>11/20/08 to 11/22/08</td>
<td>+/-</td>
<td>0.023</td>
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<tr>
<td>FV_Window 5</td>
<td>12/29/08 to 12/31/08</td>
<td>+/-</td>
<td>-0.010</td>
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<td>FV_Window 6</td>
<td>1/11/09 to 1/13/09</td>
<td>+/-</td>
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<tr>
<td>FV_Window 7</td>
<td>2/17/09 to 2/19/09</td>
<td>+/-</td>
<td>0.035</td>
<td>8.46</td>
</tr>
<tr>
<td>FV_Window 8</td>
<td>3/9/09 to 3/13/09</td>
<td>+/-</td>
<td>-0.019</td>
<td>-1.83</td>
</tr>
<tr>
<td>FV_Window 9</td>
<td>3/15/09 to 3/17/09</td>
<td>+/-</td>
<td>0.007</td>
<td>1.39</td>
</tr>
<tr>
<td>FV_Window 10</td>
<td>3/31/09 to 4/3/09</td>
<td>+/-</td>
<td>-0.007</td>
<td>-0.99</td>
</tr>
</tbody>
</table>

Notes to Table 7 on next page
Table 7 (continued)

What are credit market reactions to announcements related to potential modification or suspension of fair value or impairment accounting rules?

Panel B: Overall Market Reaction after combining individual event windows into a single signed event window (n = 2,149; R-square = 0.05 for overall sample; R-square = 0.06 for clean sample)

Regression results below are calculated after combining the individual windows in Panel A centered on key announcements during the period from Aug 29, 2008 to April 3, 2009 related to suspension/modification of Fair Value accounting rules for banks. Events with a predicted negative sign are multiplied by -1 to produce a consistent positive-signed combined event.

Model: Ret_CDS_t = α_0 + β_1CDX_Ret_t + γ_1 ΔT-Bill_t + δ_1 ΔVol_t + θ_1 FV_Window_t + ε_t

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Event date range a</th>
<th>Predicted Sign a</th>
<th>(1) All windows</th>
<th>(2) ‘Clean’ windows</th>
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<td></td>
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<td>Coef. t-stat b</td>
<td>p-value c</td>
</tr>
<tr>
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<td>--</td>
<td>--</td>
<td>0.008 3.16</td>
<td>0.002</td>
</tr>
<tr>
<td>CDX_Ret</td>
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<td>+</td>
<td>0.306 1.92</td>
<td>0.056</td>
</tr>
<tr>
<td>ΔT-Bill</td>
<td>--</td>
<td>-</td>
<td>-0.007 -2.66</td>
<td>0.009</td>
</tr>
<tr>
<td>ΔVol</td>
<td>--</td>
<td>+</td>
<td>0.056 0.78</td>
<td>0.439</td>
</tr>
<tr>
<td>FV_Events_Combined</td>
<td>8/29/08 to 4/3/09</td>
<td>+/-</td>
<td>-0.009 -1.12</td>
<td>0.265</td>
</tr>
</tbody>
</table>

Notes to Table 7:

a Individual events and event windows are described in Table 2. Event dates ending on a weekend day are truncated to the subsequent day if it is the first date in the range or to the prior day if it is the last date in the range.
b t-statistics are clustered by date to control for cross-sectional correlation.
c P-values are two-sided. Coefficients on treatment variables that are significant at less than the 10% level are shown in bold.

Definition of variables:

Ret_CDS = daily change in the level of CDS spread.
CDX_Ret = daily change in the CDX market index of Markit Group.
ΔT-Bill = change in the daily 3-month U.S. Treasury-bill secondary market rate. Source is Federal Reserve of St. Louis.
ΔVol = daily change in the implied volatility of the stock market index.
FV_Window_n = an indicator variable that equals 1 during each event window assumed to increase or decrease the probability of suspension/modification of FVA or impairment rules, 0 otherwise. Event window days are specified in table 2.
FV_Events_Combined = an indicator variable that equals 1 (-1) for all combined event window days assumed to increase (decrease) the probability of suspension/modification of FVA or impairment rules, 0 otherwise.