

The Economic Consequences of Relaxing Fair Value Accounting and Impairment Rules on Banks during the Financial Crisis of 2008-2009

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Abstract:

Fair value accounting (FVA) has been blamed for amplifying the recent financial crisis. We conduct an event study of 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 to relax FVA rules and negative reactions when policymakers support FVA. Second, we expect especially positive reactions to the curtailment of FVA and impairment rules for banks that are relatively sensitive to pro-cyclical contagion. Third, we investigate cross-sectional reactions to factors that potentially contribute 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 expect banks that have fewer alternative sources of information about fair values beyond those reported in financial statements to experience relatively negative reactions to potential relaxation of FVA and impairment rules.

We examine ten event windows related to FVA and impairment rules for financial institutions. We also examine a subset of five event windows that are relatively “clean” of potential confounding events. As predicted, we find that events that signaled an increased (decreased) probability that existing FVA standards would be relaxed (retained) generally produced positive (negative) abnormal stock price reactions for sample banks. The magnitude of the stock price reactions was positively related to our proxy for individual bank’s susceptibility to contagion in our ten-window design but was insignificant in our “clean” five-window design. Further, stock price reactions were weakly associated with firm-specific attributes that could contribute to contagion, with holdings of illiquid assets being the only significant variable in both designs.

In sum, while stock market participants appeared to welcome relaxation of FVA and impairment rules during the financial crisis of 2008-09, we provide only modest evidence that banks that benefited the most were more susceptible to contagion. We believe our study informs the debate about the role of FVA in the recent financial crisis.

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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.” CFO.com, October 29, 2008.

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 (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, 127) worried 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 In contrast, several commentators (e.g., Ball 2008, CFA Center for Financial Market Integrity 2008 and 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.

¹ Similar views are expressed by Newt Gingrich (Forbes.com, Sept. 29, 2008) and by several participants at the SEC’s October 29 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.

In this paper, we examine whether bank stock prices were affected by events that potentially changed the probability that policymakers would relax (or retain) existing FVA or impairment rules during the financial crisis of 2008-2009. This approximate six-month period of debate about FVA and impairment rules culminated with three Financial Accounting Standards Board (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 the requirement to apply 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 believe our paper is among the first to examine whether investors, on balance, believed the alleged negative effects of FVA (via reliance on fire-sale market prices in illiquid markets and the contagion caused by distress sales of assets) potentially outweighed the benefits associated with having more timely mark-to-market data for decision-making. We directly test whether relaxation of FVA and impairment rules increased 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.³ If these potential fire sale markdowns recorded under the original FVA rules did not reflect long run economic values, inefficient regulatory intervention and pro-cyclical contagion become more likely and equity values were likely to be destroyed. Alternatively, if investors on balance perceive that curtailing FVA or impairment rules could mask the underlying economics of banks, we could see relatively negative reactions to proposals that relax FVA or impairment rules. Thus, we also

³ 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 – see the Appendix for more detail.

investigate the role of a bank's information environment on the stock price reactions to the deliberations leading to 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 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 pro-cyclical contagion dominated concerns about the loss of fair value information, on average.

Next, 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 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 tended to reap the greatest benefit from relaxation of FVA and impairment rules.

Next, 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, (iii) 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 (i) banks being less than ‘well capitalized,’ (ii) poor asset liquidity, and (iii) banks’ likelihood of being subject to potential other-than-temporary impairments related to the 2008-09 financial meltdown.

Finally, 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 informativeness hypothesis, we find that banks with no analyst coverage experience smaller positive stock price reactions to events leading up to the FASB’s relaxation of FVA and impairment rules.

To rule out the possibility that our findings are driven by other contemporaneous events unrelated to the modification of FVA impacting the banking industry, we examine other sources to identify confounding events. We find that two of our event windows appear to have no confounding events and three others are confounded with events which would generate bank stock price reactions in the direction *opposite* to that predicted by the events related to FVA. We label this five-window subset as “clean” and re-run our analyses using only these five relatively clean event-windows.

We find that the banks in our clean sample experience abnormal stock returns in the predicted direction in each of the five event windows. We also find a highly statistically and economically significant stock price reaction when the five clean event windows are combined. The fact that we continue to find significant stock price reactions in an event study confined to only these relatively clean event windows adds weight to our initial results that stock market participants considered FVA and impairment rules to be value relevant for banks during the recent economic crisis.

Next, we re-estimate our cross-sectional analyses using the clean event windows. In our cross-sectional analyses, we continue to find that the coefficient on our overall proxy for contagion is

positive as predicted but is no longer statistically significant at conventional levels. Using this smaller set of clean event windows, we continue to find that the magnitude of the stock price reaction to the relaxation of FVA and impairment rules was positively related to the proportion of assets that are less liquid. However, the coefficients on proxies of other bank-specific factors that we previously found significant in our initial ten event window design have signs in the predicted direction but are no longer statistically significant.

We believe our study informs the debate about the role of FVA in the recent financial crisis. The FASB has 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. Ours is one of the first event studies to examine the impact of events that affected the probability of FVA rules being modified during a period of market turmoil, the 2008-09 financial crisis. The prior FVA literature (e.g., Barth, Landsman and Wahlen 1995; Beatty, Chamberlain and Magliolo 1995; and Cornett, Rezaee and Tehranian 1996) does not directly address the potential criticisms of FVA during a severe credit crunch, including the need to take impairments based on fire-sale prices driven by market illiquidity and the adverse contagion effects that FVA potentially causes. On balance, our evidence suggests that, when relaxation of FVA and impairment rules was discussed by regulators and the media, investors reacted favorably as if banks would benefit and pro-cyclical contagion would be reduced. We 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 subject to being marked down to fire sale prices.

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 (2009) 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 economic consequences 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.

Section 2 provides a brief background of fair value accounting in the banking industry, outlines events from September 2008 through April 2009 during the financial crisis that potentially affected the continuation of FVA and impairment rules and develops hypotheses about how these events affected bank stock prices. Section 3 describes our data sources, sample selection, research design and variable measurement. Section 4 presents the results of the overall reaction to fair value policy announcements. Section 5 investigates whether the stock market reactions are a function of bank-specific characteristics. Section 6 concludes.

2.0 Background and hypothesis development

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 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.⁴ To the extent markets are volatile and regulators use FVA for both monitoring

⁴ 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

and contracts, intervention is more likely as banks 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. These two studies conclude that investors expect 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) points out that bank regulation was the more likely reason for investors' negative assessment of the implication SFAS 115 for bank stock prices.

We evaluate the economic consequences of the relaxation of FVA and impairment rule in the financial crisis of 2008-09. During this crisis, markets for asset-backed securities, and even interbank and secured lending, were not functioning normally. The SEC and the FASB faced intense political pressure to relax FVA and impairment rules. Such pressure generates an ideal setting to examine the economic consequences associated with relaxing FVA and impairment rules. Moreover, conducting an event study during this crisis also 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 fire-sale of assets by one bank forces other banks to mark down their assets, which reduces risk-based capital for all banks that hold similar assets. Some of these otherwise healthy banks with now-impaired capital ratios are forced to sell assets and curtail lending, further lowering asset prices and

scandal prohibits banking regulators from applying regulatory accounting principles that are any less rigorous than GAAP. 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

exacerbating the financial crisis. In contrast, under historical cost accounting, losses are recognized far more slowly.

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 2009 is summarized in Table 1. We consider events from September 2008 onward as this is when the national and worldwide economies quickly deteriorated, including (i) the takeover of government-sponsored organizations Fannie Mae (Federal National Mortgage Association) and Freddie Mac (Federal Home Loan Mortgage Corporation) by the FHFA (Federal Housing Financial Agency) on September 7, 2008, (ii) the bankruptcy of Lehman Brothers and sudden sale of Merrill Lynch to Bank of America on September 14, (iii) the intervention by the Federal Reserve Bank to ‘bailout’ AIG on September 16, (iv) the temporary ban on short-selling of financial stocks by the SEC (Securities and Exchange Commission) on September 19, (v) the two remaining U.S. investment banks, Goldman Sachs and Morgan Stanley converting to bank holding companies with the approval of the Federal Reserve on September 21, (vi) the Federal Deposit Insurance Corporation (FDIC) seizing Washington Mutual, the nation’s largest savings and loan, on September 25, and (vii) Citigroup agreeing to acquire Wachovia, the nation’s 4th largest bank, on September 29. Stock prices fell dramatically and stock price volatility soared.

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 rules⁵) 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

⁵ 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.

Google news and Google blogs – see Table 1); the probability of FVA being relaxed or suspended likely increased during this period.⁶

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. SFAS 115 permitted a security to be reclassified out of the trading category in rare situations. SFAS 65 permitted a loan to be reclassified out of the held-for-sale category if the entity had the intention to hold the loan until maturity. 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)

Event window 2 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

⁶ Given there were many non-FVA events in this bill, we also run our tests after excluding this first event but find the reported inferences remain unchanged.

this event for completeness.

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, the opposition to relaxing FVA accounting rules likely reduced the probability of FVA being suspended.

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 of FVA rules being 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 Issue No. 99-20, allowing more managerial judgment in determining other-than-temporary impairments (OTTI). 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 the management may have current information suggesting that the underlying assets are still expected to fully perform. 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 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 a 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. The ninth event window 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

Our sample period from early September, 2008 through April 3, 2009 covers much of the financial crisis and thus includes other events related to the banking industry and the economy at large that occur simultaneously with the FVA events we study. Consequently, the results we document may be attributable to coincident confounding events, rather than events that signaled potential changes in FVA or impairment rules. To address this concern, we identify confounding events occurring within the ten event windows discussed above.

We use five different sources to identify potentially confounding events. Our first source is Ait-Sahalia, Andritzky, 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 identify 44 key crisis events between September 1 and December 31, 2008 by examining news releases from federal agencies and the major media outlets. Next, 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 outlets 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.”⁷

These potentially confounding events are summarized in Table 2.

We identify no 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 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 and examine whether stock market participants considered events potentially affecting FVA and impairment rules to be value relevant for banks.

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 the recent period of economic instability because of increased probability of regulatory intervention (regulatory intervention hypothesis) or because illiquid assets are inappropriately marked to market (noisy information hypothesis), 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 (decrease) the probability of FVA or impairment rules being relaxed (retained) in the banking industry are associated with significant positive (negative) stock price reactions among banks.

We examine (i) each of the ten event windows listed in Table 1 separately and (ii) an overall event window for all 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

⁷ Wall Street Journal’s timeline of the credit crisis can be accessed at http://online.wsj.com/public/resources/documents/info-CRISIS0809_Retro.html. And, the Washington Post article describing the timeline of the crisis on Wall Street is available at <http://www.washingtonpost.com/wp-srv/business/economy-watch/timeline/index.html>.

rules would be relaxed (retained).

2.6 Do banks that are more susceptible to pro-cyclical 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. For example, a bank that needed to improve its regulatory capital ratio might be forced to sell mortgage-backed securities in the 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. Other banks exposed to FVA rules that held similar securities were arguably required to write down their holdings to these fire-sale prices because of FASB guidance associated with FAS 157, “Fair Value Measurements.”⁸ This in turn caused capital adequacy ratios of some of these otherwise healthy banks to fall below ‘well-capitalized’ and forced 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).

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.

In short, we predict that banks that faced larger consequences from changes in FVA and impairment rules should experience larger stock price reactions. We construct a proxy for individual

⁸ 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 tend to base inputs observable market data were used, which essentially resulted in marking assets to fire sale prices. See Mortgage Bankers Association (2009).

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 discussions about modifying FVA or impairment rules. 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). 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). 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.

2.6 Cross-sectional market reactions to events signaling a change in FVA or impairment rules (H3-H8)

Next, we examine the cross-sectional relationship between 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 discuss each explanation of cross-sectional bank 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 or better 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 the inactive market and more banks were forced to react to improve their regulatory capital. 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 the markets are not functioning properly and market inputs are used in valuing these assets, the models essentially result in fire-sale prices. 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 fire-sale prices (Mortgage Bankers Association 2009). 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 as they mark down their assets to the recent fire-sale price.

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 suggests 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 applying 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/fire 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 changes 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 aspects of 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, 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.

3.0 Methodology

3.1 Stock price reactions

Bank-specific 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 the CRSP equally-weighted daily return, on a variable capturing interest rate changes, and on ten event dummy variables as specified in Table 1:

$$RET_{it} = \alpha_0 + \beta_1 Mkt_Ret_t + \gamma_1 \Delta T_Bill_t + \delta_1 FV_Window_t + \varepsilon_{it} \quad (1)$$

Where

RET_{it} = daily stock return for firm i ,
 Mkt_Ret_t = CRSP equally-weighted daily return,
 ΔT_Bill_t = daily change in 3-month Treasury bill secondary market rate,
 FV_Window_t = indicator variables that allow for mean shifts in returns on event days.

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 δ_1 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 Thompsom (1986).⁹ 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. To illustrate how the Sefcik and Thompson (1986) approach works, consider a setting in which the event coefficient, δ_1 (from equation 1), has a constant component and a component that depends on firm-specific values of BTM_Securities, Not-well-cap, FV_A to Total A, Level 2 and 3 FV_A, BTM_Securities, Trading_A to Total A, and Analyst Coverage. That is, δ_1 can be expressed as follows:

$$\delta_1 = b_0 + b_1 (\text{Not-well-cap}) + b_2 (\text{FV_A to Total A}) + b_3 (\text{Level 2 and 3 FV_A}) + b_4 (\text{BTM_Securities}) + b_5 (\text{Trading_A to Total A}) + b_6 (\text{Analyst Coverage}) \quad (2)$$

where:

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 undercapitalized” 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	= 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.

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

⁹ 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.

dependent variable.¹⁰ To obtain weighted-portfolio returns we define two matrices: (i) a $t \times j$ matrix, R , of returns where t is the number of periods and j the number of firms, and (ii) a $j \times k$ matrix, F , where k represents the number of determinants of cross-sectional variation plus the intercept. Finally, we estimate $(F'F)^{-1}F'R'$ 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:

$$RET_{it} = \alpha_i + \beta_i \text{Mkt_Ret}_t + \gamma_i \Delta T\text{-Bill}_t + b_i \text{FV_Window_Combined}_t, \quad (3)$$

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 $\text{FV_Window_Combined}$ 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.¹¹ 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

¹⁰ In all results reported in the paper, the FV_Window coefficients, δ_1 , examined in our cross-sectional analyses are those from firm-specific regressions of (1) with the FV_Window variable defined as $\text{FV_Window_Combined}$.

¹¹ The Bank Holding Companies Database collects financial data included in the FR Y-9C reports filed by the bank holding companies. These reports contain information from the balance sheet, income statement, risk-based capital measures and additional supporting schedules. The data is available quarterly from 1986 onwards.

were identified primarily through a search of Google, Google News, and Google Blogs. We also cross-checked our events with FASB's chronology of events listed in their project updates to be sure that we did not miss important announcements or events. Finally, all our cross-sectional variables are measured at the beginning of our event analysis period, i.e., at the beginning of September 2008.

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). As of June 30, 2008, almost 45% of sample banks were classified by regulators as less than "well capitalized." 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 1 and 2 FV_A), and 82.6% of banks in our sample were followed by analysts (Analyst Coverage). Sample banks had a mean (median) -2% (-1.8%) return during the collapse of Lehman Brothers in September 2008. The mean and median equally weighted CRSP daily index return was -0.1% from August 29, 2008 through April 3, 2009, and the total buy-and-hold market return over the same period was -23.4%. The mean and median daily change in Treasury Bill rate was -0.01% from August 29, 2008 through April 3, 2009.

4.0 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 of the all event window analysis. The sign of the market reaction was as predicted for nine of the ten events; event window four is 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 clean event windows. The sign of the market reaction was as predicted for each of these five events and, on average, banks had significant stock price reactions in the predicted direction for each of the five windows.

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 ($p = 0.001$).¹² Consistent with the results reported in column 1, we find that the inferences drawn do not change when we restrict our analysis to the 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. If market perceptions capture the underlying economics, then-existing FVA and impairment rules appeared to be

¹² 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.

perceived as harmful on average to banks during this crisis.

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

While our stock market reaction tests discussed above indicate a significant relation between potential changes in FVA/impairment rules and bank equity values, we next explore the link to contagion among banks during the financial crisis of 2008-09. Recall that contagion is the process whereby arguably independent shocks at one bank spread like a disease to other banks, and in the extreme, potentially lead to a breakdown of the entire banking system. In this section we address whether contagion among banks was exacerbated by FVA and impairment rules. In section 5.1, we conduct an overall test of the relation between contagion and banks' stock price reactions to potential changes in FVA and impairment rules. We investigate bank characteristics that potentially affect contagion in section 5.2, and consider the countervailing effect of potentially losing fair value information in section 5.3.

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 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 ($p = 0.076$), consistent with interdependencies across the banking industry and suggesting that banks more susceptible to contagion are also the ones that would benefit most 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 ($p = 0.174$). 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: (i) low regulatory capital (H3), (ii) more assets recorded at fair value (H4), (iii) poor asset liquidity (H5); (iv) larger potential impairments (H6); and (v) proportion of trading assets relative to total assets (H7).

Table 6 summarizes the estimated coefficients of the signed-mean market reaction variable (FV_Window_Combined) from seven different regressions, as described in the methods section. Again, 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. 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 positively related to banks being less than ‘well capitalized’ and marginally significant ($p = 0.102$). 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 market value tests and thus more exposed to pro-cyclical contagion as other banks marked down their assets to fire sale prices ($p = 0.075$). 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 related to the 2008-09 financial meltdown ($p = 0.064$). Finally and 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 associated with market reactions to potential modifications to FVA or impairment rules: (i) being less than 'well-capitalized' (Not-well-cap); (ii) the extent of illiquid assets on their books (sum of level 2 and level 3 fair value assets) and (iii) the likelihood of other-than-temporary impairments (BTM_securities).

Column 2 of Table 6 reports the results of examining the components of contagion after restricting the analysis to the five 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)

Finally, we investigate whether the potential loss of fair value information harms banks with a relatively weak information environment. We proxy for a weak information environment by the absence of professional analyst coverage. We argue that banks with no analyst coverage are likely to have fewer alternative sources of information and investors in these banks are more likely to be harmed by the potential relaxation of FVA and impairment rules. 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 ($p = 0.023$) to events suggesting relaxation (retention) of then-existing FVA and impairment rules. This is consistent with investors in banks without analyst coverage being concerned they would not be able to rely on analysts' expertise to compensate for 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 2009 and the CFA Center for Market Integrity 2008). 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 ($p = 0.240$).

5.4 Interpreting the cross-sectional results

So how should one interpret our mixed cross-sectional results? On one hand, one could put more weight on our higher power but potentially confounded ten event-window results. This would implicitly require one to assume that event window news is being driven largely by potential changes in FVA and impairment rules. With this interpretation, we find some evidence consistent with pro-cyclical contagion being related to: (i) banks being less than well-capitalized; (ii) the extent of banks' illiquid assets, and (iii) banks' likelihood of experiencing other-than-temporary impairments.

Alternatively, if one is concerned that other non-FVA events may be confounding our ten-window results, one should probably rely on our relatively clean but lower power five-window tests. Here, we only find evidence of pro-cyclical contagion being related to the relative magnitude of banks' illiquid assets. While this is arguably the most direct measure of banks' exposure to pro-cyclical FVA-induced contagion (as level 2 and level 3 assets were most subject to concern about being marked down to fire sale prices during the crisis), none of the other cross-sectional explanations of stock price reactions are statistically significant.

6.0 Conclusion

The financial crisis of 2008-09 arguably led to a near meltdown 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 requiring banks to mark down many of their assets to fire sale prices. For example, assume a bank has to sell assets at fire sale prices due to a shortfall in regulatory capital. This, in turn, can force 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 maintain adequate regulatory capital.

We examine stock price 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. We identify ten event windows where policymaker deliberations, recommendations and actions potentially affected the probability of FVA and impairment rules being relaxed or supported. We find that four of seven events that signaled an *increased* probability that existing FVA standards would be relaxed had significant *positive* abnormal stock price reactions for sample banks. We find that two of three events that signaled a *decreased* probability that existing FVA standards would be relaxed exhibited significant *negative* abnormal stock returns.

We also identify a subset of five “clean” event windows that either (i) did not have confounding events or (ii) had potential confounding events operating in the opposite direction from that predicted by potential changes in FVA or impairment rules. Restricting our analysis to these five “clean” event windows, we find that both of the “clean” event windows that signaled an *increased* probability that the existing FVA standards would be relaxed had significant *positive* abnormal stock price reactions. Further, all three of the “clean” event windows that signaled a *decreased* probability that existing FVA standards would be relaxed exhibited significant *negative* abnormal stock returns. In addition, we find a highly significant reaction when we aggregate all events into one window, regardless of whether the aggregation is over the original ten event windows or a subset of five “clean” event windows. In sum, investors apparently acted as if the potential negative effects of then-existing FVA and impairment rules outweighed the benefits associated with having more timely and hence transparent mark-to-mark

data for decision making.

In cross-sectional tests, we find mixed evidence on the distribution of stock price reactions being consistent with investors worrying about contagion among banks. When we examine all ten event-windows, banks that were most susceptible to pro-cyclical contagion tended to garner the greatest benefit from relaxation of FVA and impairment rules. When we restrict our analysis to a subset of five relatively clean event windows, we fail to find evidence that banks most susceptible to contagion reaped the greatest benefits from potential modification of FVA and impairment rules. 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 2008-09 financial meltdown. Both were at least marginally significant in our ten-window tests but were insignificant in our clean five-window tests. In our ten-window tests, we also found some evidence that banks with no analyst coverage react less positively to the events that relaxed FVA. This suggests that FVA data may provide timely and informative disclosures about the banks' financial soundness when other information sources are less available. In sum, the ten-window results are consistent with opposing views related to relaxing FVA, i.e., market participants act as if FVA encourages contagion but also provides more informative disclosures for at least some banks. However, analyst coverage was insignificant in our relatively clean five-window tests.

While our research indicates that 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 might argue that had regulators used separate cost-basis RAP, political and market reactions to U.S. GAAP FVA and impairment rules would likely have been muted. However, research by Hill and Ingram (1989) and Blacconiere et al

(1991) reminds us that Savings and Loans (S&L) strategically used regulatory accounting principles (“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 either.

Further, 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. This approximate six-month period of deliberation culminated with three Financial Accounting Standards Board (FASB) staff positions (FSPs) issued on April 9, 2009 that affected FVA and impairment rules: (i) FSP No. FAS 157-4, (ii) FSP No. FAS 115-2 and FAS 124-2; and (iii) FSP FAS No. 107-1 and APB 28-1.

FSP 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). The notion that a transaction resulting from a forced liquidation or distressed sale does not represent fair value also is discussed in paragraphs 10 and 17 of Statement 157.

FSP No. FAS 115-2 and FAS 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 a credit loss 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.

FSP No. FAS 107-1 and APB 28-1 relates to fair value disclosures of any financial instruments. This FSP 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.

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

Event (Window) No.	Date (Day of week)	Description	Source	Δ probability of relaxation of FVA	Google news/blog hits
1 (W1)	9/28/2008 (Sunday)	Draft of 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.	EESA 2008 draft dated Sep 28, 2008	Increase	471
2 (W1)	9/29/2008 (Monday)	Draft EESA 2008 put to vote in the house, but it did not pass.	Wikipedia	Decrease	3845
3 (W1)	9/30/2008 (Tuesday)	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	SEC Press Release 2008-234	Increase	99
4 (W1)	10/1/2008 (Wednesday)	On the evening of Oct 1, 2008, the Senate passed a revised version of the EESA 2008.	Wikipedia	Increase	<i>See event 6</i>
5 (W1)	10/2/2008 (Thursday)	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. ¹³ 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.	FAF letter	Decrease	3
6 (W1)	10/3/2008 (Friday)	The House passed the revised version of the EESA. President Bush signed the bill into law within hours of the vote.	Wikipedia	Increase	5604 (Events 4 and 6 combined)
7 (W2)	10/13/2008 (Monday)	IASB issued amendments to IAS 39 and IFRS 7 that permitted the reclassification of some financial instruments that would allow banks to avoid using FV in reporting financial instruments. (These reclassifications were already allowed under US GAAP in rare circumstances.) Sir David Tweedy	IASB new release	Increase	7

¹³ 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.

		acknowledges that IASB was forced to amend rules due to political pressure.			
8 (W2)	10/15/2008 (Wednesday)	EU regulator's committee votes unanimously to accept IASB's emergency changes made to mark-to-market rules.	Financial Times	Increase	6
9 (W3)	10/29/2008 (Wednesday)	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 www.securitization.net says that SEC did not indicate what future course of action it is considering.	Multiple client newsletters	Decrease	19
10 (W4)	11/21/2008 (Friday)	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)	www.marketwatch.com	Increase	3
11 (W5)	12/30/2008 (Tuesday)	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 <u>not</u> be suspended.	SEC report and CFO.com	Decrease	71
12 (W6)	1/12/2009 (Monday)	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.	FASB website	Increase	10
13 (W7)	2/18/2009 (Wednesday)	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.	FASB press release	Decrease	26
14 (W8)	3/10/2009 (Tuesday)	Bernanke in a speech to 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.	Washington Post	Increase	75
15 (W8)	3/11/2009 (Wednesday)	In a testimony to the House Financial Services subcommittee, Mary Schapiro, SEC Chairwoman, supported changes to mark-to-market rules.	CFO.com	Increase	10

16 (W8)	3/12/2009 (Thursday)	In a House Financial Services subcommittee hearing standard setters and regulators were pressed hard to alter existing fair value accounting rules immediately.	CFO.com	Increase	121
17 (W9)	3/16/2009 (Monday)	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.	FASB press release and CFO.com	Increase	59
18 (W10)	4/1/-4/2/2009 (Wednesday-Thursday)	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.	Financial Times	Increase	282

Notes to Table 1:

EESA = Emergency Economic Stabilization Act

IASB = International Accounting Standards Board

FSP EITF = FASB Staff Position Emerging Issues Task Force

OTTI = other-than-temporary-impairments

Table 2

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

Event Window (Predicted Market Reaction)	Dates	Confounding Event	Direction of Market Reaction
W1 (+)	09/27/08 to 10/04/08	09/25 - WAMU is closed by OTS.	-
		09/28 - TARP recapitalization of nine US banks.	+
		09/29 - Hypo Real Estate rescue, Ad hoc bank bailout of Bradford and Bingley as well as Fortis.	+
		09/30 - Irish Government Guarantee Scheme, Ad hoc bank bailout of Dexia	+
		09/30 - Net Bank fails.	-
		10/02 - Policy rates maintained by ECB.	
		10/03: EESA is passed, UK long-term repo with expanded collateral, Enhancement of depositor protection in UK.	+
W2 (+)	10/12/08 to 10/16/08	10/12 - The Federal Reserve Board announces its approval of an application by Wells Fargo to acquire Wachovia	+
		10/13 - French loan guarantees, UK support package details are announced and Euro zone announces co-ordinated measures to provide liquidity to the US dollar.	+
		10/14 - US Temporary Liquidity Guarantee Program: US govt. announces capital purchase program of up to \$250B	+
		10/15 - ECB announces expansion of the collateral framework	+
W3 (-)	10/28/08 to 10/30/08	10/28 - The U.S. Treasury Department purchases a total of \$125 billion in preferred stock in nine US banks under the Capital Purchase Program of TARP	+
		10/29 - Federal Reserve cuts the key federal funds rate by 50 basis points to 1.00 percent, the Treasury and FDIC announce that they are crafting a plan to provide government guarantee to almost 3 million homeowner mortgages.	+
W4 (+)	11/20/08 to 11/22/08	11/20 - Fannie Mae and Freddie Mac declare that they will suspend mortgage foreclosures until Jan, 2009.	+
		11/21 - FDIC seizes three banks, Timothy Geithner is elected as the Treasury Secretary.	?
		11/21 - The US Treasury Department purchases a total of \$3 billion in preferred stocks	+

		in 23 US banks under the Capital Purchase Program.	
		11/23 and 11/24 – Citigroup rescue announced.	+
W5 (-)	12/29/08 to 12/31/08	12/29-12/30: US Treasury Department announces that it will purchase \$5 billion in preferred stock from GMAC as part of its program to assist domestic automotive industry.	+
		12/31 - The US Treasury Department purchases a total of \$1.91 billion in preferred stock from seven US banks under the CPP.	+
W6 (+)	01/11/09 to 01/13/09	No confounding events identified.	
W7 (-)	02/17/09 to 02/19/09	02/19 - Obama announces a plan, which could cost as much as \$275 billion, aimed at enabling 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 announces purchase of corporate financing instruments.	+
W8 (+)	03/09/09 to 03/13/09	03/13 - The Federal Reserve announces that the target range for the Federal Funds rate will remain at 0 to 0.25%.	+
W9 (+)	03/15/09 to 03/17/09	No confounding events identified.	
W10 (+)	03/31/09 to 04/03/09	04/01 - Sheila Blair calls for a new system of regulation for big financial institutions deemed to be high risk and included raising their capital requirements.	+/-

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**

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

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)

Δ 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 is the Stock Market Reaction to announcements related to potential modification or suspension Fair Value or Impairment Accounting Rules? (H1)**

Panel A: Market Reactions to individual event windows^a (n = 44,117; R-square = 0.18 for overall sample; n = 38,237; R-square = 0.17 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.

$$\text{Model: } \text{RET}_{it} = \alpha_0 + \beta_1 \text{Mkt_Ret}_t + \gamma_1 \Delta\text{T-Bill}_t + \delta_1 \text{FV_Window_n}_t + \varepsilon_{it}$$

Independent Variables	Event date range ^a	Predicted Sign ^a	(1) All windows			(2) 'Clean' windows		
			Coeff.	t-stat	P-value ^b	Coeff.	t-stat	P-value ^b
Intercept	--	--	-0.0006	-0.37	0.712	-0.0003	-0.22	0.827
Mkt_Ret	--	+	1.0339	15.67	<0.001	1.1081	19.02	<0.001
$\Delta\text{T-Bill}$	--	-	-0.0174	-1.23	0.111	-0.0208	-1.49	0.070
FV_Window 1	9/27/08 to 10/4/08	+	0.0144	2.75	0.003	--	--	--
FV_Window 2	10/12/08 to 10/16/08	+	0.0078	0.46	0.323	--	--	--
FV_Window 3	10/28/08 to 10/30/08	-	-0.0109	-1.24	0.108	-0.0083	-1.71	0.045
FV_Window 4	11/20/08 to 11/22/08	+	-0.0037	-0.29	0.613	--	--	--
FV_Window 5	12/29/08 to 12/31/08	-	-0.0042	-1.63	0.052	-0.0054	-1.67	0.049
FV_Window 6	1/11/09 to 1/13/09	+	0.0029	1.72	0.044	0.0036	1.72	0.044
FV_Window 7	2/17/09 to 2/19/09	-	-0.0090	-2.10	0.019	-0.0075	-1.63	0.052
FV_Window 8	3/9/09 to 3/13/09	+	0.0170	2.20	0.015	--	--	--
FV_Window 9	3/15/09 to 3/17/09	+	0.0119	3.57	<0.001	0.0105	2.61	0.005
FV_Window 10	3/31/09 to 4/3/09	+	0.0032	0.88	0.190	--	--	--

Notes to Table 4 on next page

Table 4 (continued)

What is the Stock Market Reaction to announcements related to potential modification or suspension Fair Value or Impairment Accounting Rules? (H1)

Panel B: Overall Market Reaction after combining individual event windows^a 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.

$$\text{Model: } \text{RET}_{it} = \alpha_0 + \beta_1 \text{Mkt_Ret}_t + \gamma_1 \Delta\text{T-Bill}_t + \delta_1 \text{FV_Events_Combined}_t + \varepsilon_{it}$$

Independent Variables	Event date range ^a	Predicted Sign ^a	(1) All windows			(2) 'Clean' windows		
			Coeff.	t-stat ^b	p-value ^c	Coeff.	t-stat ^b	p-value ^c
Intercept	--	--	-0.0005	-0.35	0.731	-0.0004	-0.30	0.762
Mkt_Ret	--	+	1.0376	16.30	<0.001	1.1031	20.30	<0.001
ΔT-Bill	--	-	-0.0178	-1.31	0.096	-0.0196	-1.44	0.075
FV_Events_Combined	8/29/08 to 4/3/09	+	0.0089	3.13	0.001	0.0083	3.41	<0.001

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 **bold**. We report (1 - (p/2)) values for coefficients that assume a sign opposite to the one predicted.

Definition of variables:

RET_{ie} = 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 RET_{i,1}.

Mkt_Ret = equally weighted return from CRSP, a portfolio of all publicly held U.S. stocks.

ΔT-Bill = change in the daily 3-month U.S. Treasury-bill secondary market rate. Source is Federal Reserve of St. Louis.

FV_Window_n = an indicator variable that equals 1 (-1) during each event window assumed to increase (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.

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.

$$\text{Model: } Ab_RET_i = \beta_0 + \beta_1 \text{Contagion}_i + \varepsilon$$

Independent Variables	Predicted Sign ^a	(1) All windows			(2) Clean windows		
		Coeff.	t-stat ^b	p-value ^c	Coeff.	t-stat ^b	p-value ^c
Intercept	--	0.1505	2.12	0.036	0.0658	1.42	0.157
Contagion	+	0.2849	1.44	0.076	0.0860	0.94	0.174

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: (i) likelihood of being required to take impairments on non-fair value investments, (ii) level of regulatory capital, (iii) use of fair value assets, (iv) amount of trading assets, (v) illiquidity and (vi) analyst coverage? (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.

$$\text{Model: } Ab_RET_i = \beta_0 + \beta_1 \text{Not-well-cap}_i + \beta_2 \text{FV_A to Total A}_i + \beta_3 \text{Level 2 and 3 FV_A}_i + \beta_4 \text{BTM_Securities}_i + \beta_5 \text{Trading_A to Total A}_i + \beta_6 \text{Analyst Coverage}_i + \varepsilon$$

Independent Variables	Hypothesis/ Predicted Sign ^a	(1) All windows			(2) Clean windows		
		Coeff.	t-stat ^b	P-value ^c	Coeff.	t-stat ^b	P-value ^c
Intercept	--	-2.2945	-1.43	0.156	-0.2498	-0.39	0.700
Not-well-cap	H3/+	0.0657	1.27	0.102	0.0132	0.34	0.369
FV_A to Total A	H4/+	0.0383	0.60	0.276	-0.3056	-1.71	0.955
Level 2 and 3 FV_A	H5/+	0.7237	1.45	0.075	0.8066	2.06	0.021
BTM_Securities	H6/+	2.2850	1.53	0.064	0.3491	0.54	0.294
Trading_A to Total A	H7/+	-1.715	-0.99	0.837	-1.181	-1.01	0.842
Analyst Coverage	H8/+	0.2867	1.93	0.023	0.0529	0.71	0.240

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 - (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 2.

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.