

Did Fair Value Accounting Contribute to the Financial Crisis?

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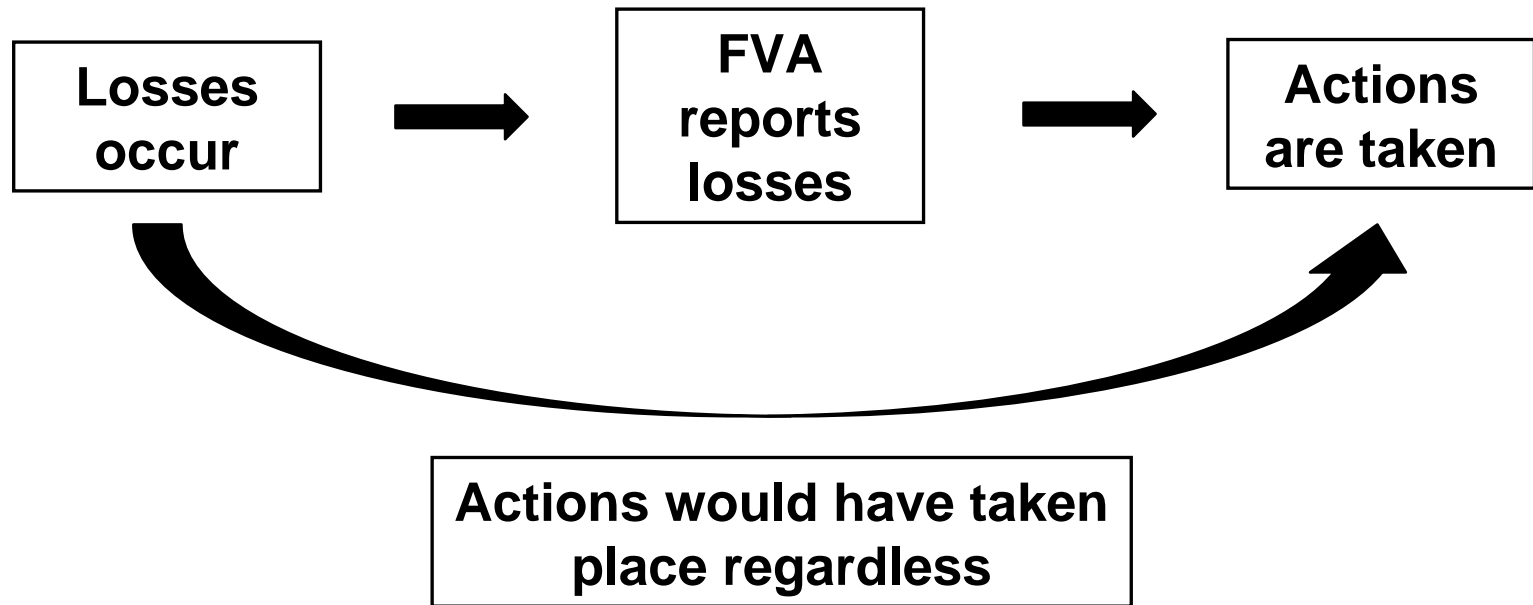
Motivation

- FVA has been blamed to have exacerbated the financial crisis
 - Excessive leverage in booms
 - Excessive write-downs in busts
 - Downward spirals: declines in asset values lead to write-downs, which leads to fire sales, further declines, and further write-downs
 - Contagion: Fire sales become relevant “marks” for other banks
- Major policy debate and intense pressure on the standard setters
- Arguments about the problems are often taken for granted, but:
 - Specific evidence of the problems is rarely provided
 - Instead references to various models, but they model full FVA and not the accounting system that is currently in place
- Did FVA accounting contribute to the current crisis?

The Challenge of Identifying FVA as a Culprit

- Market prices are important – not only with FVA
 - Were problems caused by using market prices in accounting?
- Large losses obviously cause problems for banks
 - But did FVA exacerbate the problems?
 - Would these problems have not occurred otherwise?
- HCA as a benchmark or counterfactual
 - Would HCA have been better?
 - Impairments under HCA are quite similar to write-downs under FVA
 - Would the market have reacted differently if banks had not reported losses?

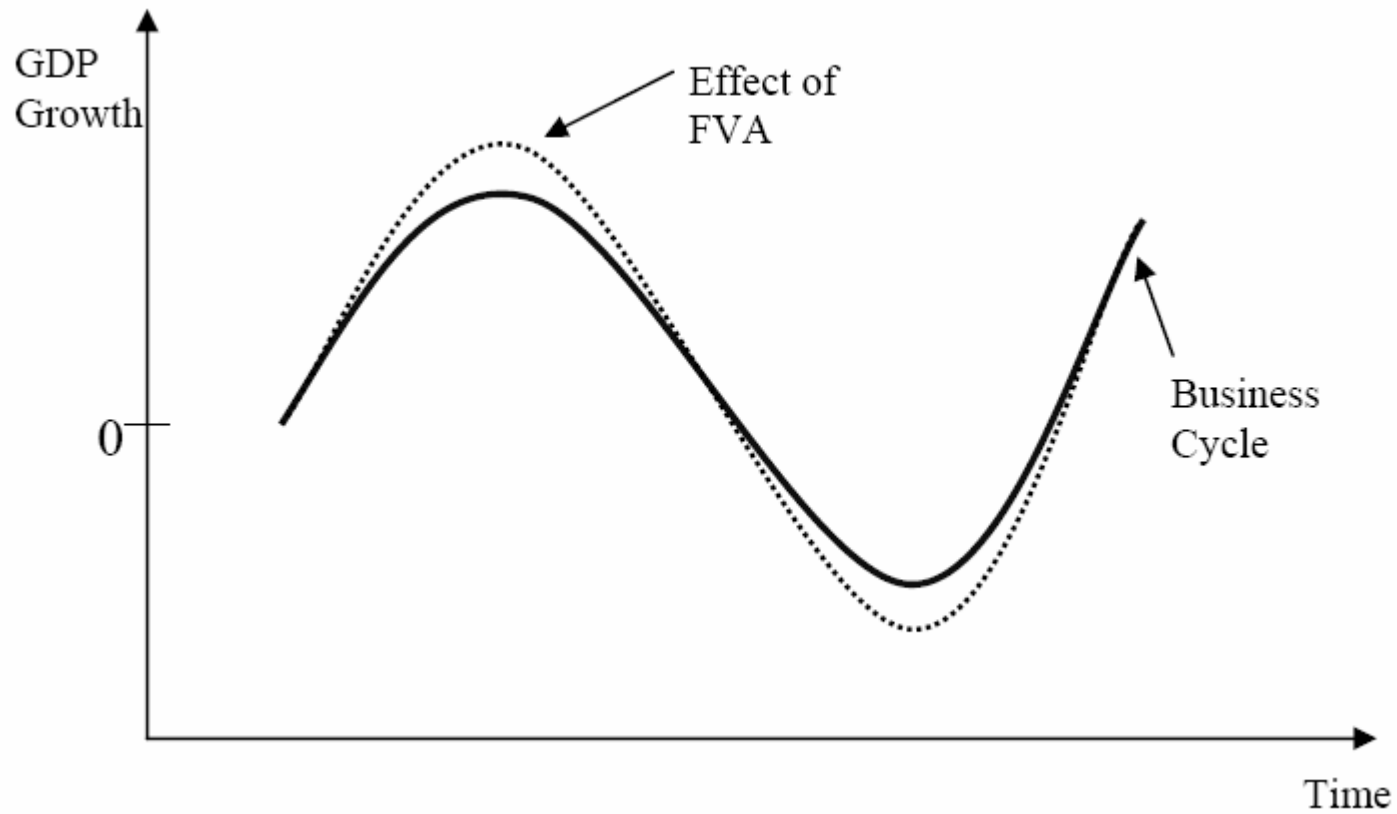
When can we blame FVA?



A Word on Procyclicality

- There are many sources of procyclicality for highly leveraged financial institutions:
 - Market-value-based bank management (VaR)
 - Haircuts and margin requirements (collateralized borrowing and repurchase agreements)
 - Collateralization requirements (based on ratings)
- Banks are forced to raise capital or sell assets in a financial crisis
- But this is not a matter or a result of FVA per se

Procyclicality of FVA?



A Roadmap to Identifying FVA as a Culprit

- We need to identify the link through which FVA caused problems
 - Capital regulation
 - Contracts (e.g., debt covenants, compensation contracts)
 - Accounting fixation by investors, rating agencies and bank managers
- FVA as stipulated by GAAP includes various circuit breakers (that can mitigate the effects if links exist)
 - Did they work?

Sneak Preview

- It is unlikely that FVA contributed to the severity of the financial crisis
 - FVA plays a limited role for most bank assets
 - There are mechanisms in place to limit negative effects from using (distorted) market prices:
 - FVA allows deviations from market prices or dealer quotes
 - Not all FV changes affect banks' net income
 - Adjustments for regulatory capital purposes
 - We do not find evidence that these mechanisms failed
- It is unlikely that FVA increased the leverage in the boom
 - FVA played a limited role for most bank holding companies
 - Assets for which FVA applies are very liquid and could be sold and repurchased to realize gains under HCA

What is Fair-Value Accounting (FVA)?

- FV = Price that would be received to sell an asset in an orderly transaction between market participants
 - Explicit restriction: It is not a price from a distress or fire sale
- FV is based on an exit price notion
 - Illiquidity has a systematic effect as spreads widen
- Under GAAP, three different levels of FVs depending on the inputs
 - Level 1: Market price for same asset \Rightarrow pure marking to market (MTM)
 - Level 2: Prices for similar assets and observable inputs for models
 - Level 3: Predominantly unobservable inputs for models
- Banks have (some) discretion and can deviate from prices or quotes
 - 66% of FV is in Level 2 (and Level 3 accounts for another 10%)
 - For over 75% of the fair values, banks use models (rather than prices directly)
 - Key issue: How much discretion did (and should) banks have?

Key Assets on Balance Sheets of U.S. Banks

	<i>Large Bank Holding Companies</i>	<i>Smaller Bank Holding Companies</i>	<i>Large Investment Banks</i>	
Trading Assets	12.22%	0.71%	Trading Assets	33.34%
Net Trading Assets	6.71%	0.37%	Net Trading Assets	15.66%
Other Securities	14.69%	20.67%	Collateralized Agreements	39.54%
Available-for-sale	14.56%	17.79%	Receivables	12.15%
Held-to-maturity	0.13%	2.88%	Securities Received as Collateral	2.83%
Loans and Leases	47.28%	61.67%	Securities Segregated for Regulatory and other Purposes	3.99%
Repo Agreements	10.04%	2.41%	Financial Instruments	97.73%
Financial Instruments	87.83%	90.02%	Total Assets	100%
Total Assets	100%	100%		

Key Rules

- Loans (including mortgages) and held-to-maturity securities (HTM) are reported at amortized costs
 - For most BHCs, loans constitutes over 50% of the balance sheet
 - But there are FV disclosure requirements for both loans and HTM
 - Interestingly, these disclosures are not criticized or questioned in the debate
- For securities reported at FV, changes do not always affect the income statement or regulatory capital
 - Unrealized changes in AFS securities affect only book equity (AFS \approx 15% of BS for BHCs)
 - Unrealized changes in AFS debt securities do not affect Tier 1 or Tier 2 capital
 - “Full FVA” applies only to trading assets (for most banks $<$ 10% of TA)

Impairment Testing

- Impairment testing is an old concept and it also applies to assets reported at (amortized) cost
- Other-Than-Temporary Impairments (OTTI) for AFS & HTM
 - OTTI affect income and regulatory capital
 - Concept addresses temporary price declines (e.g., liquidity crunch)
- Banks have some discretion in recognizing OTTI
 - Citigroup reported the first OTTI charges in the fourth quarter of 2008
 - Citigroup's total OTTI in 2008 was \$2.8 billion on AFS & HTM compared to over \$19 billion of net unrealized losses

Next steps

- Rules do not stipulate pure marking to market prices
 - They contain various circuit breakers
 - Fire-sale restriction
 - OTTI
 - Discretion in determining FV
- Procyclicality argument implies that
 - FVA leads to excessive leverage in booms
 - Write-downs in busts are excessive
- Any evidence on the use of circuit breakers?
 - Possible that the rules or their implementation were too tight

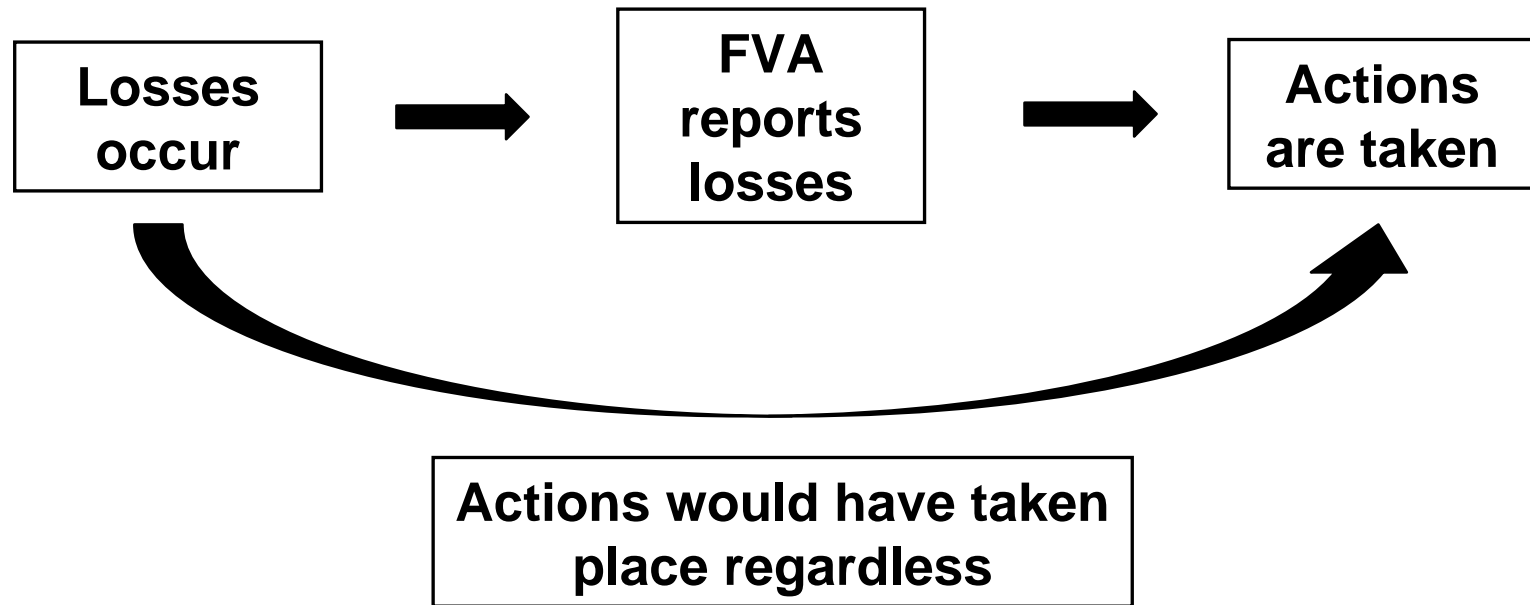
FVA in the Boom Period

- Unlikely that FVA write-ups contributed to high leverage
 - For IB, the use of market values seems inevitable (and not driven by accounting rules) given their business and funding model
 - For most BHC, the fraction of FV assets affecting regulatory capital in a boom was very small
- For liquid securities, HCA does not really impose a constraint
 - Gains trading and repurchase agreements

FVA in the Crisis: Investment Funds and Investment Banks

- At the beginning of the crisis
 - Slow-down in growth and decline in housing prices
 - Increase in delinquency rates and defaults (especially subprime)
- Led to major problems in mortgage markets
 - Information asymmetry, uncertainty, reduced liquidity and difficulties with refinancing & repos
- Problems affected investment funds (or SIVs)
 - Given their business model (short-term financing & redeemable funds), FVA is not an option, it is inevitable
 - Similar arguments apply to investment banks (e.g., Bear Stearns faced a run)
- Concerns about subprime exposure would have existed under HCA
 - If anything, the issue was lack of transparency
- There were problems, but essentially the same under HCA

Recall this picture



FVA in the Crisis: Bank Holding Companies

- BHC generally have a different business model
 - For a few large BHC with substantial trading positions, the earlier discussion for IB also applies
- Regulatory capital constraints (and other mechanisms) could in principle lead to downward spirals
- But even if link exists, two questions arise:
 - Were there widespread fire sales or price distortions?
 - Did the circuit breakers work?
 - Banks get to classify securities at the outset
 - OTTI (instead of strict impairment)
 - Regulatory capital add-backs (e.g., AFS debt securities)
 - Deviations from market price (e.g., use of models, Level 3)

Mixed Evidence on Price Distortions

- Key element of the FV criticism is that it forces write-downs to distorted or artificially low prices
 - What evidence do we have?
- Coval et al. (2009) find that pricing of high-grade credit risk is consistent with movements in equity markets
 - Of course, equity markets could also suffer from distortions
- Bank of England (2008), Fitch (2008) and various banks claim that ABX indices cannot be justified by fundamentals
 - Exclude liquidity premia & non-credit-risk factors from fundamentals
 - But they can be relevant, especially if there are solvency concerns
- Even if prices (or quotes) are distorted, FVA allows for deviations
 - Evidence of distorted prices is not sufficient

Evidence on Deviations from MTM

- Use of models is widespread (Level 2 and Level 3)
 - Banks report almost all MBS in Level 2 or Level 3 (even prior to the crisis) \Rightarrow MBS were generally not subject to pure MTM
- Net transfers into Level 3 from other categories were clearly possible
 - Level 3 assets doubled during the crisis (7% to almost 14%)
 - Relative to total FV, transfers were small but individual banks made substantial transfers

Evidence on Deviations from MTM (cont.)

- It is of course possible that banks did not transfer enough assets into Level 3 to avoid contagion
 - But UBS & Citi moved to “fundamental models” or “intrinsic cash flow methodology” for subprime (in Q4 07)
 - JPM (Q4 2008): Majority of CMO, CDO & ABS in Level 3
- Thus, problem assets appear to have been moved to Level 3 either before or during crisis
- But it is possible that Level 3 FVs are too low to avoid contagion and downward spiral

Evidence on Market Pricing of Reported FVs

- Is there evidence of excessive write-downs?
- Several studies on market pricing:
 - E.g., Goh et al. (2009); Kolev (2009); Song et al. (2009)
- Basic idea:
 - Regress market price per share on FVs and other assets (per share)
 - What is the market value of \$1 reported FV?
 - Coefficient of about 1 on FV (or L1-L3) assets implies market pricing and reporting are consistent
- Key result: Level 3 assets have a coefficient below 1 and a lower coefficient than Level 1 and Level 2 FVs
 - No clear evidence of excessive write-downs, such as coefficient > 1

Two Explanations for Market Pricing of FVs

- Reporting explanation
 - Level 3 assets are overstated relative to market value of these assets
 - Banks use the discretion in Level 3 to their advantage
- Fire-sale explanation
 - Banks deviate from market prices, i.e., reduce some of the extreme liquidity discounts in accordance with FAS 157
 - Market anticipates that the bank may have to engage in fire sales and hence prices L3 assets below reported values
 - In this case, market agrees with long-run value reported but simply anticipates that some assets will have to be sold at a discount
- However, the second explanation implies that
 - Banks are deviating from extreme prices
 - Fire sales take place in spite of higher reported FVs

Evidence from Market-to-Book Ratios

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

Evidence from Loans

- Banks report loans at amortized cost in the balance sheet but have to provide FVs in the notes
- Loans are fairly illiquid and hence we expect that, if anything, reported FVs of loans would be fairly low during the crisis

	<i>Loans Held</i>		<i>Reported Loss Expectation</i>	
	Amortized Cost	Fair Value	Allowance for LLL	Total Implied Loss
Bank of America	866.2	841.6	23.1	47.7
Citigroup	660.9	642.7	29.6	47.8
JP Morgan	721.7	700.0	23.2	44.8
Wells Fargo	849.6	835.5	21.1	35.1

Key Takeaways

- We do not find evidence supporting claims that
 - FVA contributed to the crisis in a major way or that
 - HCA would have helped to mitigate the crisis
- FVA is far less pervasive and links to leverage or regulatory capital are far less obvious than often thought
- Banks made ample use of the discretion in FVA
 - The notion of pure marking to market is in many cases a myth
- Little evidence that banks were forced to excessively write-down assets (for some assets the opposite is likely true)
- But we neither claim that there were no downward spirals nor that more FVA during the crisis would have been better
 - Other factors (e.g., collateralization, haircuts, margin requirements, short-term financing) seem more important
 - There are various subtle tradeoffs with respect to the accounting system

Policy Issues and Tradeoffs

- It is important to recognize that one reason why FVA played a small role is its limited use and effect on banks' capital
 - Our study cannot be used to legitimize an extended use of FVA
- While FVA did not hurt, it is also not clear how much it helped either
 - Did FVA really provide an early warning in this crisis?
 - As illiquidity increases, FVA loses many of its desirable properties
 - Evidence from HCA for loans suggests slow impairment (as in prior crises)
- FVA may inject some volatility into the numbers and the system but timely impairments facilitate prompt corrective actions
 - Tradeoff (also with respect to ex ante incentives)
 - Even if there are problems with FVA, it is not clear that we would prefer HCA
- It is not clear that problems of procyclicality or regulatory capital are best addressed (directly) in the accounting system