

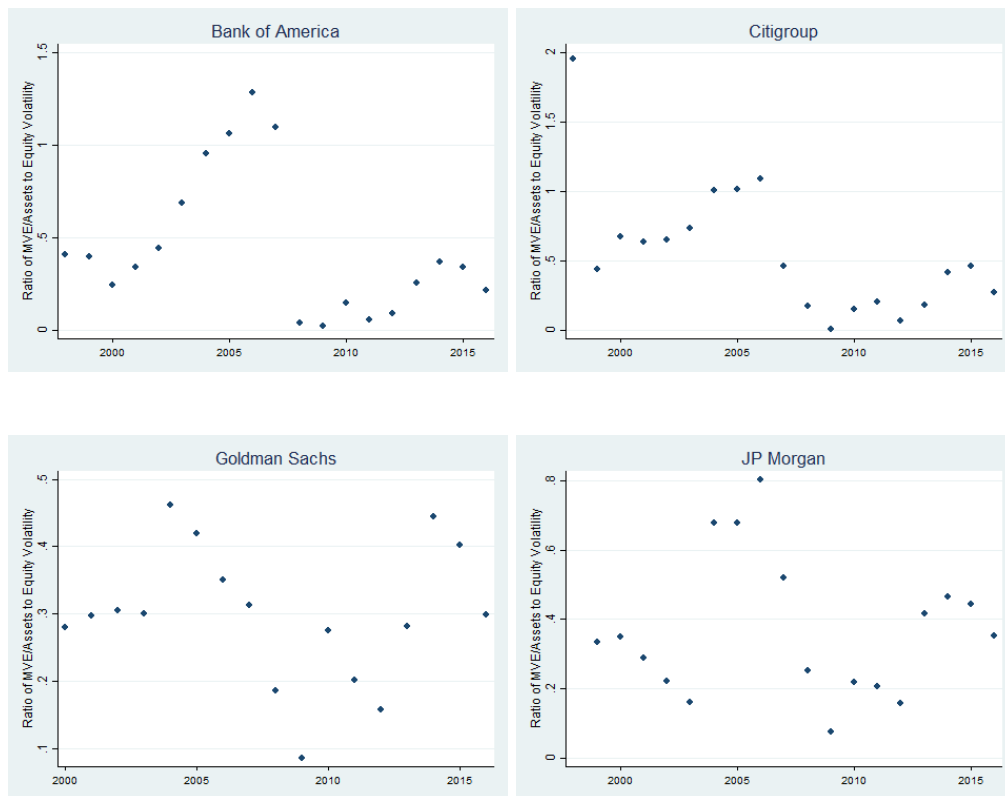
Understanding Long-Term Bank Trends

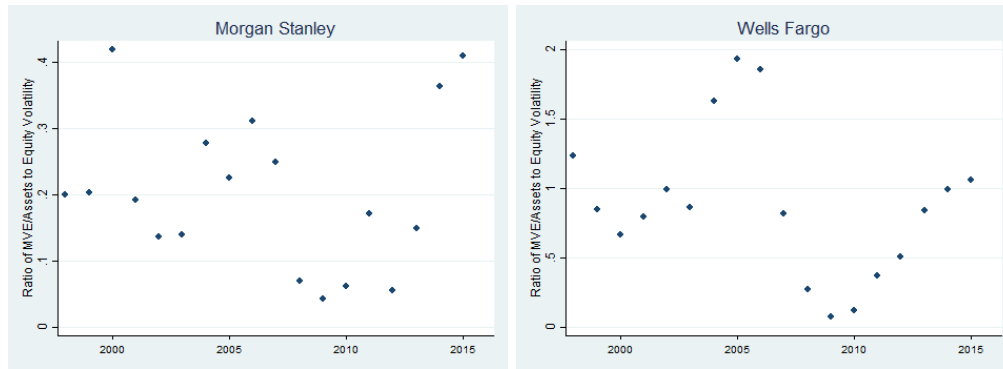
October 24, 2016

1 Relationship between MVE/Assets and Volatility Over Time

For each bank, we computed an implied measure of asset volatility by taking the ratio of MVE/assets to equity volatility and seeing how this has evolved over time.

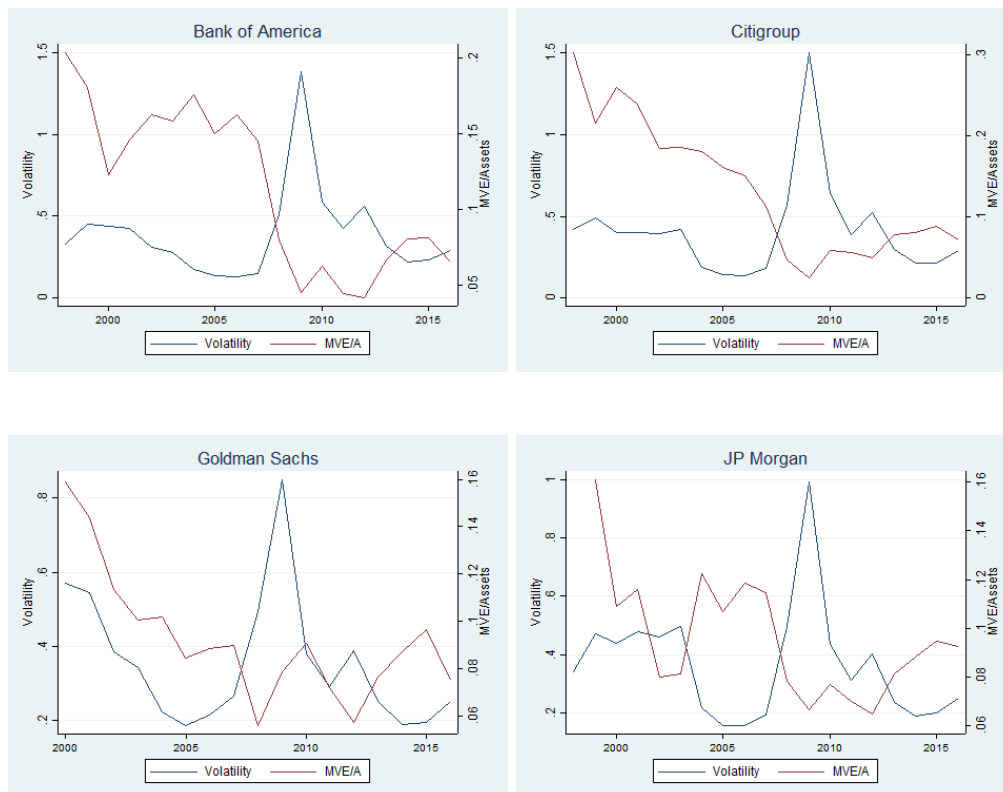
1.1 MVE ratio/volatility

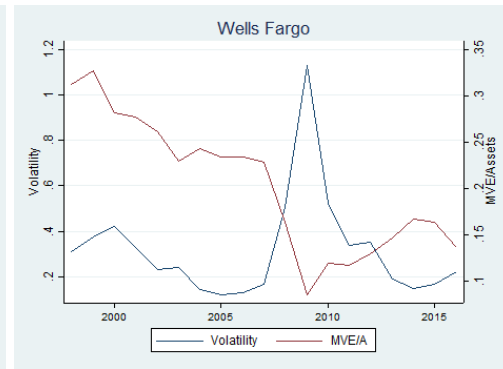
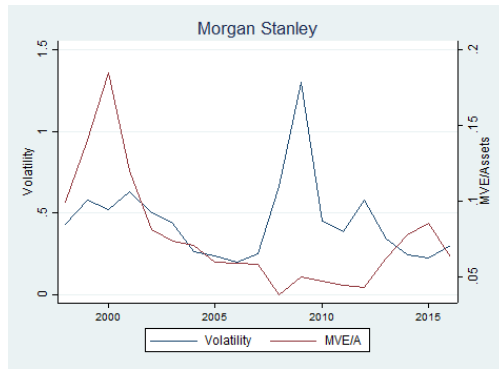




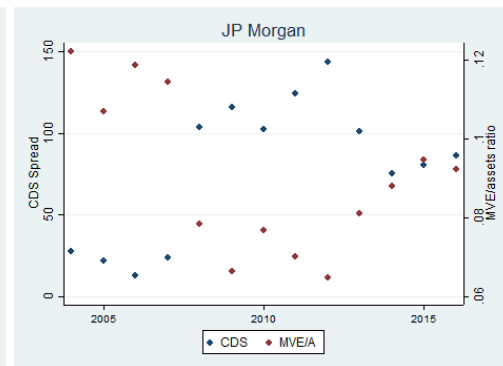
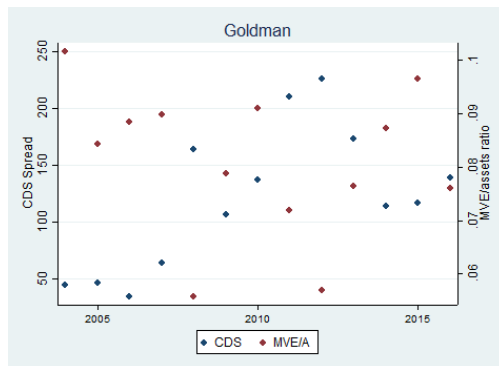
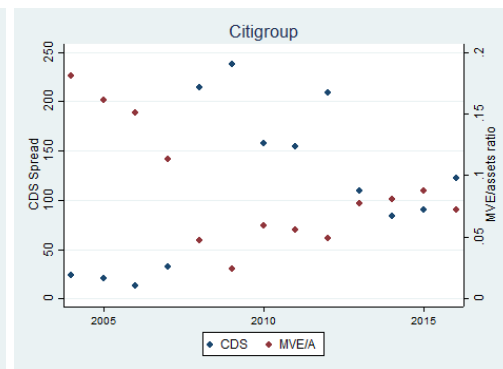
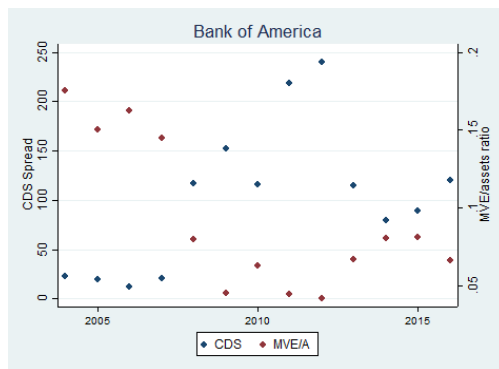
1.2 MVE/assets and volatility over time

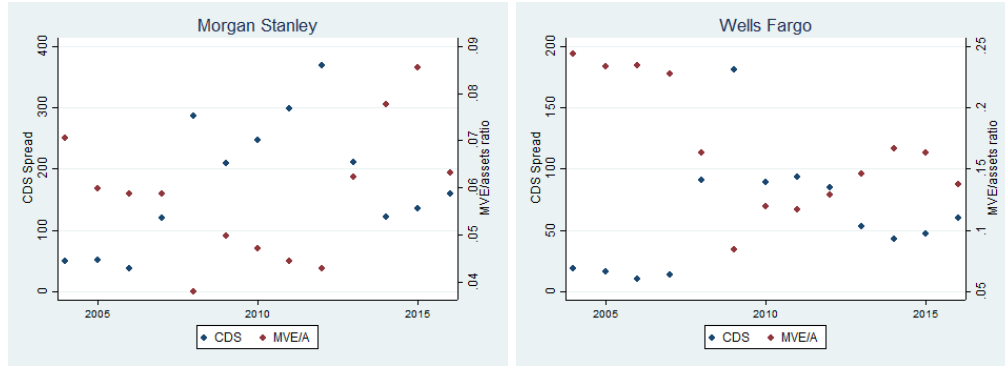
To understand what is driving the graphs above, we also graphed the MVE/assets and volatility series separately.





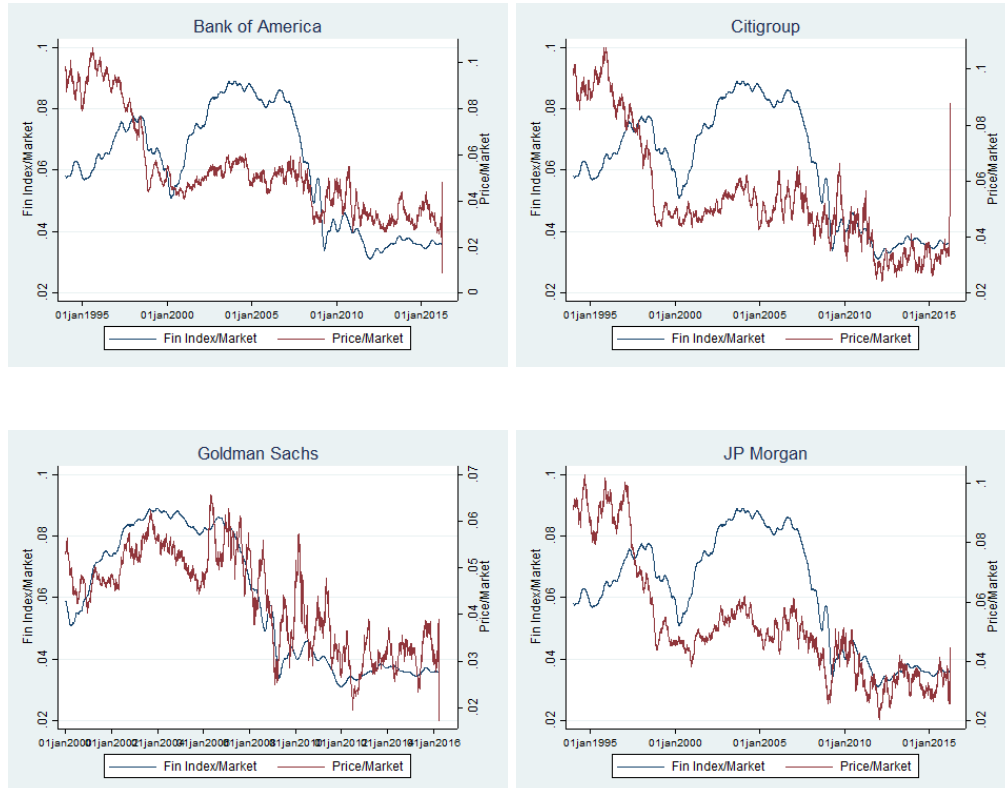
2 Relationship between MVE/Assets and CDS Spread Over Time





3 Pre-crisis bubble

We compare our six banks to the S&P 500 to see if there is a large pre-crisis bubble. To do this, we take the closing price of (1) our six banks and (2) the KBW Nasdaq Bank Index and divide it by the S&P 500. We use a three month moving average to compute these ratios.





4 Pulling crisis back

We construct our basic tables (for the Big 6) using 1995-2005 as the pre-crisis period.

Table 1: Big 6 Beta

<i>Bank</i>	1995-2005	2002-2007	Post-Crisis	2015
Bank of America	1.09	0.88	1.79	1.22
Citigroup	1.48	1.19	1.78	1.32
Goldman Sachs	1.24	1.33	1.32	1.21
JP Morgan	1.39	1.35	1.46	1.20
Morgan Stanley	1.63	1.56	1.85	1.40
Wells Fargo	0.97	0.77	1.43	1.04
Mean	1.30	1.18	1.61	1.23
Median	1.32	1.26	1.62	1.22

Table 2: Big 6 Volatility

<i>Bank</i>	1995-2005	2002-2007	Post-Crisis	2015
Bank of America	29.54	19.70	39.02	23.21
Citigroup	34.19	24.51	38.06	21.75
Goldman Sachs	36.71	26.92	28.23	19.35
JP Morgan	34.78	28.01	29.57	20.17
Morgan Stanley	40.60	31.75	37.22	22.60
Wells Fargo	26.29	17.29	28.74	16.94
Mean	33.69	24.70	33.47	20.67
Median	34.49	25.71	33.40	20.96

Table 3: Big 6 Volatility/Market

<i>Bank</i>	1995-2005	2002-2007	Post-Crisis	2015
Bank of America	1.78	1.24	2.21	1.97
Citigroup	2.08	1.48	2.13	1.85
Goldman Sachs	1.88	1.77	1.67	1.64
JP Morgan	2.06	1.68	1.71	1.71
Morgan Stanley	2.42	2.01	2.18	1.92
Wells Fargo	1.63	1.13	1.59	1.44
<i>Mean</i>	1.98	1.55	1.92	1.76
<i>Median</i>	1.97	1.58	1.92	1.78

5 Yellen on our paper

From Full committee hearing on "Semi-Annual Testimony on the Federal Reserve's Supervision and Regulation of the Financial System." (SD/24) on September 28, 2016.

Congressman Duffy (R-WI) said: "Larry Summers recently -- I'm sure you've read his piece -- said that towards the price capital, information is at least superficially inconsistent with the view that banks are far safer today than they were before the crisis.

And some support for the notion that risks have actually increased. Larry Summers, do you disagree with Mr. Summers, as well?" And Yellen responded: "Yes I -- I do, I disagree significantly with that conclusion because it is based on the notion that markets properly evaluated the risks and banking work in this agency (ph) before the crisis. And nothing could be further from the truth."

Congressman Ellison (D-MI) followed up that: "My good friend from Wisconsin, Congressman Duffy, was asking you to respond about an opinion piece by Larry Summers. I got the sense that you might want to elaborate a little bit more on what he asked you. Would you like to take the last 20 or so seconds, just to sort of stretch out on your answer a little bit?"

And Yellen responded: "Yes, so thank you for that. So Summers, finds that measures of riskiness, of bank debt, haven't diminished since the financial crisis, two reasons. He finds that, one is that prior to the crisis, clearly market participants underestimated risks. And second, we're dealing with too big to fail and investors can no longer expect that they will be shielded from risks if things go wrong..."