Naked Short Selling: The Emperor's New Clothes?

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Naked Short Selling

- **“Short selling”** is the sale of a stock not owned by the seller. The stock is borrowed, or adequate borrowing arrangements are made. Such short selling is labeled as “covered shorting”.

- In **"naked short selling”,** the seller does not borrow or arrange to borrow the securities in time to make delivery to the buyer within the standard three-day settlement period. As a result, the seller fails to deliver securities to the buyer when delivery is due (known as a "failure to deliver" or "fail“)— definition by the SEC.

Naked Short Selling

- The naked short seller (NSS) fails to deliver (**"failure to deliver"** or “FTD” – really, more of a delay, than a failure; median age: 2.9 days (Boni 2006)).

- The Depository Trust & Clearing Corp. (DTCC) has an automatic procedure-Stock Borrow Program (SBP) - to settle such failed trades.
- The SBP uses a voluntary pool of lenders.
- Naked Short Seller bears the cost of SBP : Collateral, which is market to market like a futures contract, Interest on Collateral and other expenses similar to a covered short sale.

Naked Short Selling

- When the FTD cannot be settled using the SBP, the DTCC leaves the position open, unless a buy-in is initiated (very rarely done : Boni, 2006).

- The seller does not receive funds until the shares are delivered and funds remain with the buyer.

- Hence, the NSS has effectively borrowed either from the SBP or the buyer.

Is it Legal?

- Since January 2005, Regulation SHO requires short sellers to **LOCATE prior to trading**.
- Some exemptions (mainly market makers).
- By the third day, a bona fide attempt has to be made to deliver shares.
  - So, ‘strategic fails’ are, in fact, illegal (but hard to prove).
- So, why do fails still happen, if traders have to locate?
  - Locate is not a lock-in.
  - ‘Easy to locate’ list can be used.
  - Rules were tightened in July 2008.

Recent Interest

- In the recent past, regulators and the media have focused heavily on short-selling, and in particular, naked short-selling.
- Countries that have recently imposed new restrictions on short selling or naked short selling include the United Kingdom, Spain, Portugal, France, Italy, Greece, Germany, Luxemburg, Russia, South Korea, Singapore, Hong Kong and Taiwan.

Recent Interest

- Over **4,600 printed articles** on naked shorting have appeared in last 2 yrs in English-language magazines and newspapers alone.
  - Naked short sellers have (very!) few friends.
- Three major US investor groups are lobbying <u>against</u> naked shorting.
  - Movement for Market Reform
  - National Coalition Against Naked Short Selling (NCANS)
  - Coalition for Reform of Regulation SHO

Recent Interest

- Several lawsuits are petitioning from relief from alleged losses at the hands of naked shorters.

- Several CEO's have alleged manipulation of their stock and hence been vocal in their opposition to naked shorting.
  - Overstock, Patrick Byrne
  - Bear Stearns, Alan Schwartz
  - Lehmann, Richard Fuld
  - Morgan Stanley, John Mack

Naked Short Sellers: Barbarians?

- Why the specific focus on naked shorting?
  - fear of potential disruption to markets created by **phantom shares** and the consequent forced lending by the buyer;
  - fear that (those damn!) speculators will profit from stock **price manipulation** at the expense of the "good guys".
- There is relatively little talk of any beneficial effects of naked shorting: naked short sellers are typically perceived, quite unequivocally, as barbarians.

Naked Short Sellers: Barbarians?

- SEC rules after January 2005 require that intermediaries involved in the trade "**locate**" the shares before any short sale.
- In practice, before the changes to the rules in July 2008, this requirement was fulfilled by having lists of stock in which the stock was plentifully available, rather than identifying a specific bloc of shares.
- Also, settlement failures are not uncommon in financial markets.
- Hence, it is difficult to strongly assert manifest illegality in naked shorting.

Naked Short Sellers: Barbarians?

- Naked shorting also does not usually result in actual non-delivery to the buyer because of the protective systems of the electronic depositary.

- However, it is true that willful and blatant disregard for the rules and procedures that provide the framework for orderly markets, cannot and should not be condoned indefinitely.
  - Yes, naked short-sellers are villains of sorts.

- But, is that all they are, barbarians?

Can Short Sellers be Angels?

- Both covered and naked short selling should arguably contribute to the price discovery process by enabling value-traders and value arbitrageurs to more quickly bring the prices of overpriced securities in line with their “true value”.
  - Hence, **ease of short selling should help in reducing the size and frequency of positive pricing errors**.
- This expectation is the same for both covered and naked short-selling.

Can Short Sellers be Angels?

- Both intermediaries and traders, should also be able to “provide liquidity” more efficiently and cost-effectively in the presence of either covered or naked short-selling.
- **Ease of short-selling should arguably enable liquidity suppliers to continually manage their inventory** to minimize their risk exposure as needed in the wake of changing trade imbalances through investor purchases and sales.
- Once again, this expectation is similar for both covered and naked short-selling.

Regulating Short-Selling

- Yet, the SEC established *Regulation SHO* in 2005: rules that relaxed restrictions on short selling, e.g. by phased removal of the uptick rule, but, at the same time, increased restrictions on naked short selling.
- More recently, between Jul 21st and Aug 12th, 2008, US regulators temporarily banned naked short selling in 19 financial stocks.
- Clearly, short sellers are seen positively but their undressed cousins are viewed as being problematic.
- In this research, we investigate naked short selling from this perspective.

Does Short Selling actually Improve Market Quality?

- Asquith and Meulbroek (1996), Aitken et. al. (1998), Danielsen and Sorescu (2001), Jones and Lamont (2002), Gezy et. al. (2002), Ofek and Richardson (2003) and Reed (2007) all provide evidence that **stock prices do not fully incorporate information in the presence of short sale constraints.**
- Daouk and Charoenrook (2005) study the effects of changing restrictions on short selling in 111 countries and conclude that **allowing short selling improves market quality.**
- Bris et. al. (2007) similarly analyze equity markets around the world and find that **prices incorporate negative information faster in markets where short sales are allowed.**
- An exception: Shkilko et. al. (2007) document manipulative "**predatory short-selling**" around intra-day price reversals.

Does Short Selling Improve Market Quality?

- There is growing consensus that **short sellers enhance pricing quality** from studies that use recently available actual short sales data:
  - Diether et. al. (2007) find that short sellers correct overreaction in stock prices.
  - Boehmer et. al. (2008) use proprietary NYSE order data to find that short sellers, especially institutional short sellers, act as value arbitragers and correct overpriced securities, to generate permanent price effects and efficient pricing.
  - Bardong, Bartram and Yadav (2008) show that the pricing efficiency of short-sellers arises from better market (rather than security-specific) information, and from longer-lived (rather than short-horizon intra-day) information.

Naked Short Selling Literature

- Law papers
- Finnerty (2005): theory model, concludes NSS is likely to be used for manipulation.
- Culp and Heaton (2007): theory model, NSS is not different from covered.
- Evans et al. (2008 RFS forthcoming): FTDs linked to hard-to-borrow situations.
- Boni (2006 JFM): FTDs fall after REG SHO.
- Edwards and Hanley (2008): IPOs with naked short selling are more accurately priced.
- Two recent working papers - Boulton and Braga-Alves:

  1) *Naked Short Selling and Market Returns*

  2) *The Skinny on Naked Short Selling Restrictions*

Research Questions

- First, given that naked short selling should potentially contribute to the price discovery process by enabling value-traders and arbitrageurs take short positions when securities are overpriced, we ask:

Does naked short selling reduce positive pricing errors?

Does naked short selling reduce the magnitude and hence the volatility of pricing errors?

Research Questions

- Second, given that the additional liquidity due to the facilitation of liquidity suppliers should lead to lower trading costs and more orderly markets, we ask:

Does naked short selling reduce bid-ask spreads?

Does naked short selling reduce order imbalances?

Does naked short selling reduce stock price volatility?

Research Questions

- Third, given the popular perception of the alleged role of naked short-sellers, we ask:

Did naked short-sellers manipulate prices to ultimately bring about the demise of Bear Stearns, Lehman, Merrill and AIG in 2008?

Did naked short-selling intensify before or after credit rating downgrades of financial institutions in 2008?

Research Questions

- ***Did market quality improve when SEC banned naked shorting in July/August 2008?***

Finally, we ask:

- ***Was Reg SHO successful in curbing manipulative naked short selling?***

Measuring Naked Shorting

- Our proxy for naked short selling is based on the **outstanding number of fails to deliver** (FTDs).

- Daily data on which has been made available by the SEC under the Freedom of Information Act (FOIA) since March 22, 2004.
- The SEC dataset records outstanding fails to deliver only when the latter exceed 10,000 shares. We assume that, when no FTDs are reported, the number of FTDs is equal to zero.

Measuring Naked Shorting

- We proxy naked short selling by the Outstanding Naked Short Ratio (**ONSR**) defined for each day T as the estimated **cumulative naked short sales till day T scaled by the total number of shares outstanding** (obtained from CRSP).
  - Sum the observed and "latent" FTDs and divide by the number of shares outstanding.
- We also use other data to compute the extent of total shorting and the extent of covered shorting and construct suitable ratios to best reflect or estimate the economic inference we wish to make.

Measuring Naked Shorting

- Clearly, our ***ONSR* variable is a *proxy* for naked short-selling**, not an exact measure for it.
- In particular, we can think of three factors that can make our FTD-based proxy potentially imperfect.

- First, as highlighted by the SEC, “human or mechanical errors or processing delays can result from transferring securities in physical certificate rather than book-entry form, thus causing a FTD”.
  - such errors and delays should be random and not systematically related to any of our hypotheses and therefore may add noise but should not affect any of our conclusions.

Measuring Naked Shorting

- Second, Edwards and Hanley (2008) suggest that FTDs “in price supported IPOs may arise from the mechanism of the offering process”.
  - Accordingly, to avoid the possibility of IPO-related FTDs, we exclude securities that started trading during our sample interval.
- Third, it can be conjectured that a reported FTD may be triggered by a trading counterparty failing to receive due to funds for the purchase not being posted in a timely manner, rather than being caused by a trading counterparty failing to deliver because of naked shorting.
  - Evans et al. (2008) find that the number of FTDs is strongly related to rebate rates, indicating that FTDs originate largely from (naked) short transactions.
  - Boni (2006) shows that the number of FTDs is related to the number of short sales and offers evidence that market makers ‘strategically’ fail to deliver when borrowing costs are high, again pointing to FTDs being governed by (naked) short selling.

Measuring Naked Shorting

- We conduct our own analysis and find that new fails on day *t*+*3* are significantly and positively related only to short volume on day *t* and not to non-short volume on day *t*.

$$New\ FTD_{i,t+3} = \alpha_i + \beta_{1,i} Short\ Volume_{i,t} + \beta_{2,i} Non\ Short\ Volume_{i,t} + \varepsilon_{i,t}$$

	Parameter Estimate	*t*-value	
Short Volume	0.05	4.71	***
Non-Short Volume	<0.01	1.17	

Measuring Naked Shorting

- The SEC banned naked short selling of the stocks of 19 publicly traded financial institutions from July 21st to August 12th, 2008.
- During this ban period, the SEC order required that

  "no person may effect a short sale in these securities using the means or instrumentalities of interstate commerce unless such person or its agent has borrowed or arranged to borrow the security or otherwise has the security available to borrow in its inventory prior to effecting such short sale"
- Clearly, such an order only affected naked short sales and not covered short sales or anything else. As such, this ban should arguably decrease the number of FTDs originating from naked short sales, and not affect the number of FTDs originating for any other reason, in case such other FTDs exist.

Securities affected by the ban

- BNP Paribas Securities Corp., Bank of America Corporation, Barclays, Citigroup Inc., Credit Suisse Group, Daiwa Securities Group Inc., Deutsche Bank Group AG, Allianz SE, Goldman, Sachs Group Inc, Royal Bank ADS, HSBC Holdings PLC ADS, J. P. Morgan Chase & Co., Lehman Brothers Holdings Inc., Merrill Lynch & Co., Inc., Mizuho Financial Group, Inc., Morgan Stanley, UBS AG, Freddie Mac, Fannie Mae.

- We obtain data from CRSP for 17 of the 19 affected securities.
  - BNP Paribas Securities Corp. and Daiwa Securities Group Inc. trade over the counter, and the CRSP database does not include over the counter securities.

Measuring Naked Shorting

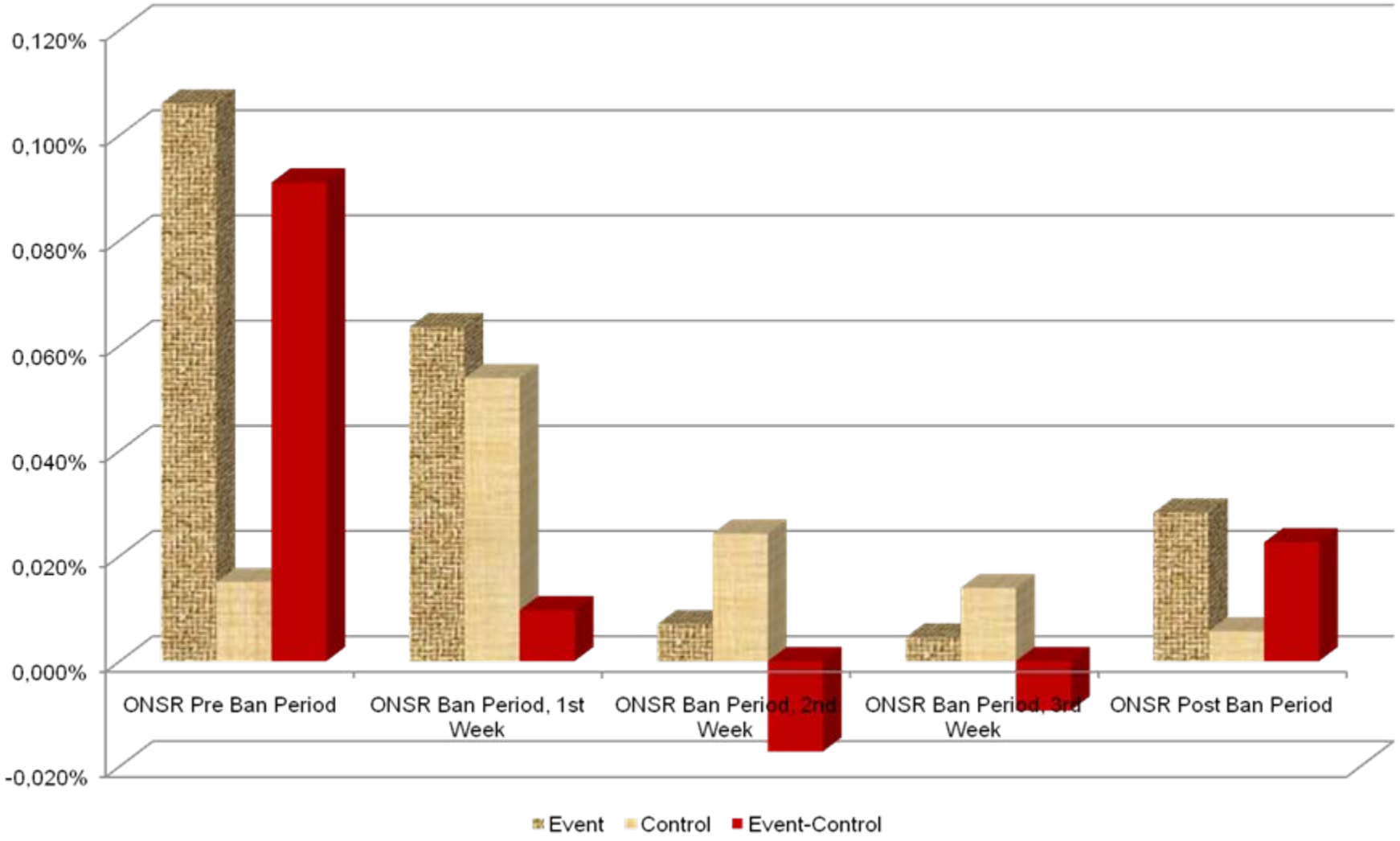
- We do an event study for FTD's for the SEC ban period
- We construct an industry and market cap matched sample.
- Then, for each of the 34 securities (the 17 affected securities and the 17 unique matches) and for each day in the interval January 1st to August 12th, 2008, we compute the *Outstanding Naked Short Ratio, ONSR*.
- We then compute mean *ONSR* for both event and control samples over a pre-ban period (January 1st to July 20th, 2008), for each week in the ban period (July 21st to August 12th, 2008), and for the three-week period following the ban (August 13th to September 2nd, 2008).

Measuring Naked Shorting

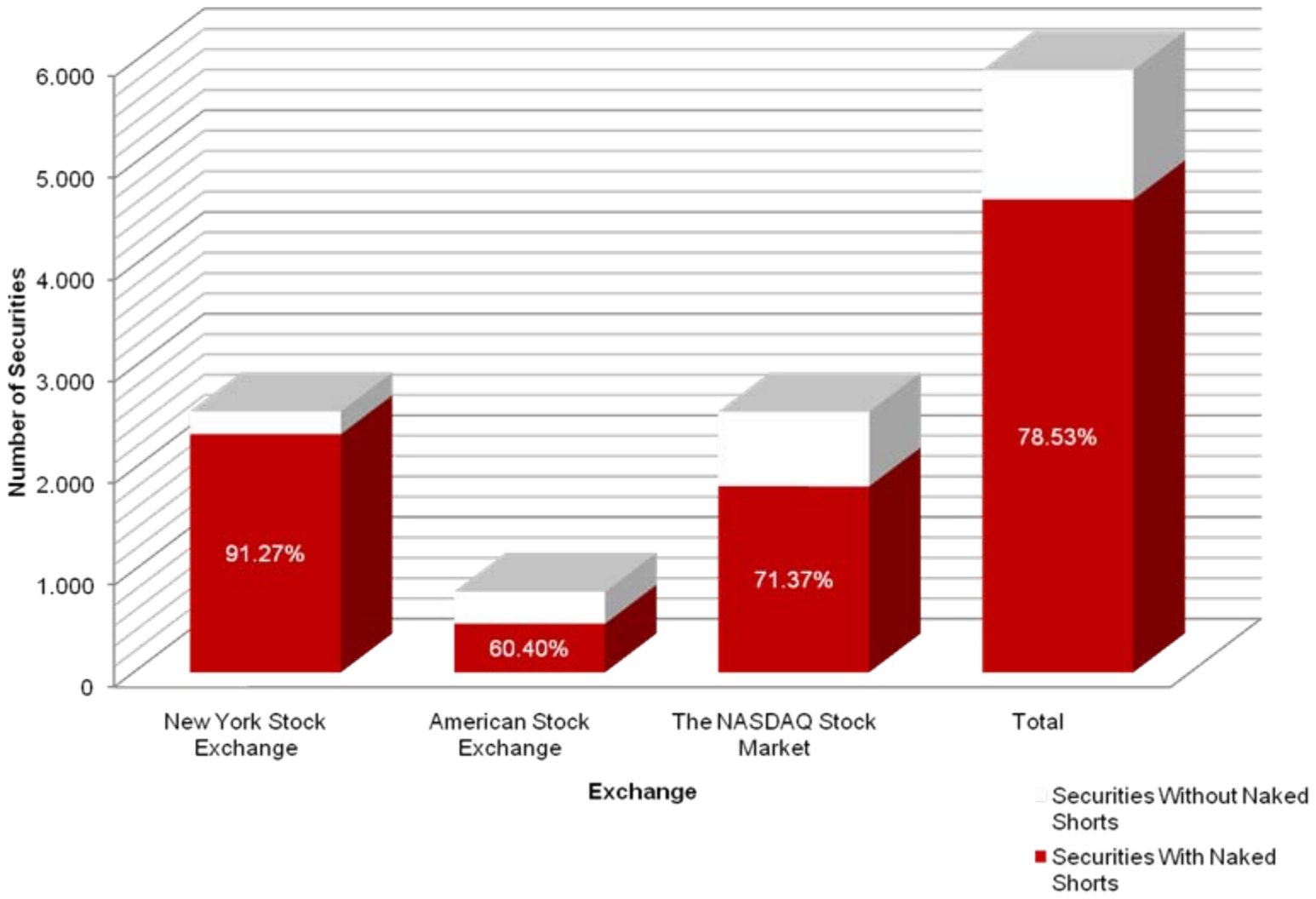
- *ONSR* for event companies drops by over 95%.
- The difference between the *ONSR* for the event and control firms is +ve prior to the ban, -ve during the ban, and +ve again after the ban is lifted.

All numbers scaled by Pre Ban values	Event Companies			Control Companies		
	Mean	t value		Mean	t value	
ONSR Pre Ban Period	100%	14	***	100%	15	***
ONSR Ban Period, 1st Week	60%	9	***	358%	55	***
ONSR Ban Period, 2nd Week	7%	1		161%	25	***
ONSR Ban Period, 3rd Week	4%	1		92%	14	***
ONSR Post Ban	27%	4	***	38%	6	***

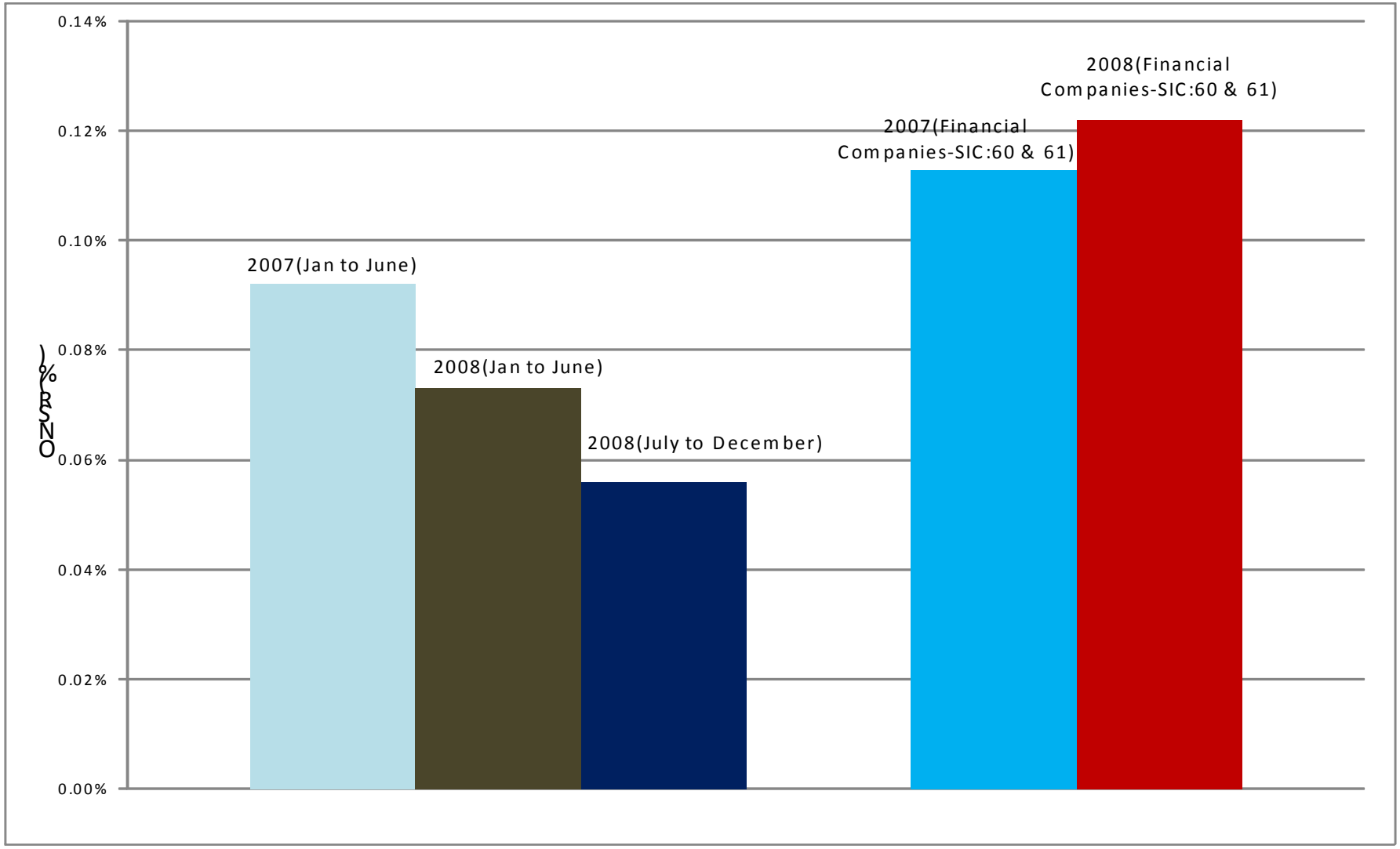
Measuring Naked Shorting



Incidence of Naked Short Selling



Incidence of Naked Short Selling



Measuring Pricing Error

- *Pricing Error* is the deviation of the observed market price from the estimated “true” fundamental price, scaled by the fundamental price.
- In the spirit of Hasbrouck (1993) we decompose observed return into a latent “fundamental” or efficient “random-walk” price and an error component.
- The information-efficient or the fundamental price of a security is a latent stochastic variable; hence, we employ a Kalman-filter methodology as in Hamilton (1985) and Dong et al. (2008) to estimate it.

Measuring Pricing Error

- Hamilton (1985) employs such an approach to estimate expected quarterly inflation, the latent variable, based on observed actual inflation.
- In the same way, we utilize the observed daily stock prices to infer the unobserved fundamental price, and hence the "pricing error". The outline of the estimation model is as follows:

Observed Stock Price: $S(t) = F(t) + Y(t)$

Latent Fundamental Price: $F(t) = \mu + F(t-1) + \varepsilon(t), \quad \varepsilon \sim N(0, \sigma_{\varepsilon}^2)$

Pricing Error: $\Delta Y(t) = -\alpha Y(t-1) + \varphi(t), \quad \phi \sim N(0, \sigma_{\phi}^2)$

Other Market Quality Measures

- **Relative Order Imbalance** is computed by dividing the dollar difference between buys and sells by total dollar daily trading volume.
- **Scaled Bid-Offer Spread** is a liquidity measure computed as the difference between the last bid and the last ask of the day, divided by the average of the last bid and last ask of the day.
- **Volatility** is computed as the standard error of 5-min stock price returns.

Data and Sample Period(s)

- The main analysis is done over the period Jan to Jun 2007 because of comprehensive availability of actual short sales data.
  - Compute mean ONSR, form 10 deciles, take 30 securities from each decile.
- Given that naked shorting varies very significantly over different deciles, we do a separate analysis of all firms in the highest naked shorting decile.
- We also separately analyze the ten most-naked-shorted securities as well.

Descriptive – by Decile

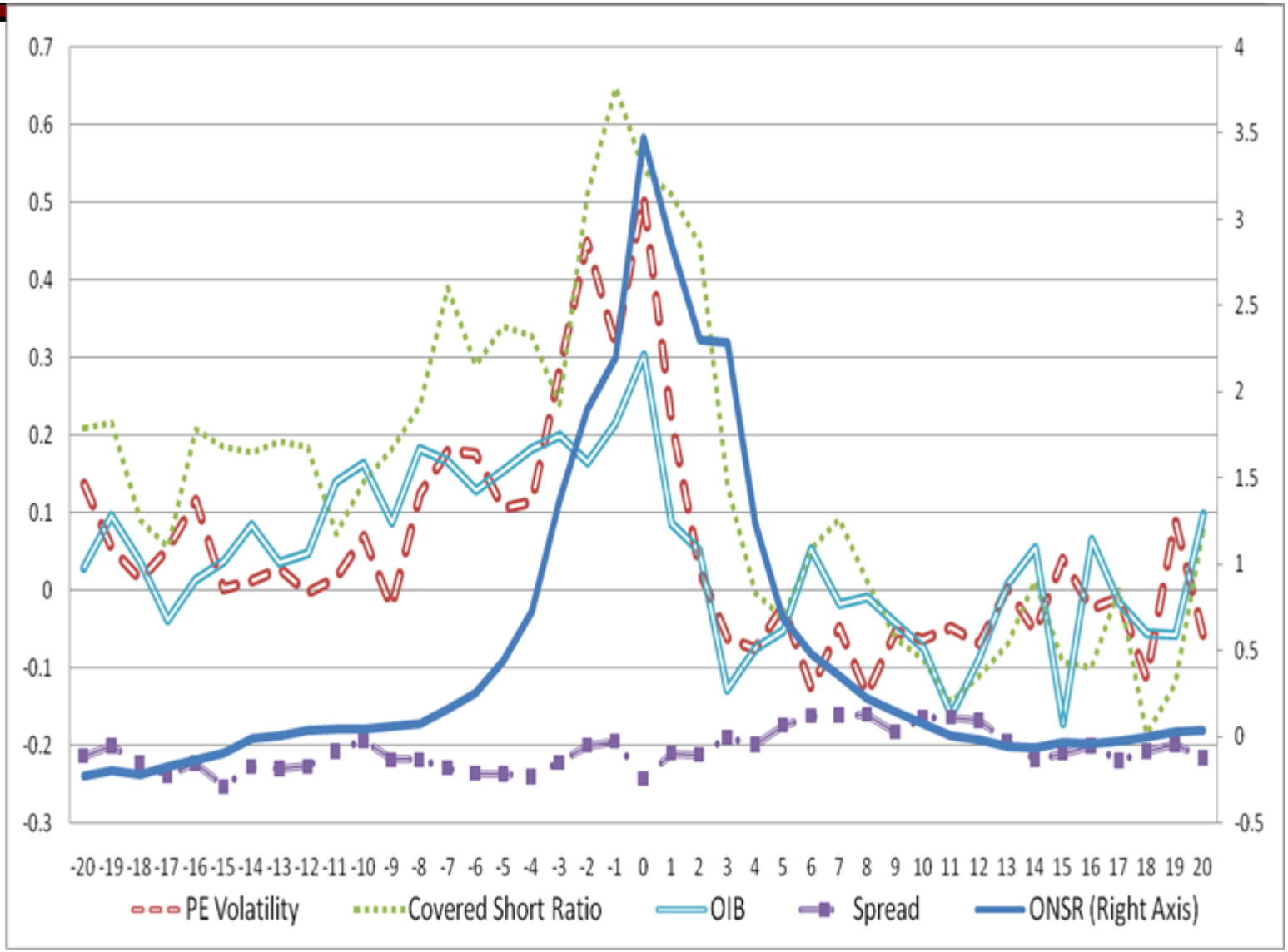
Decile	*ONSR*	*New Naked Short Ratio*	*Covered Short Ratio*	*Pricing Error*	*Proportion Positive Pricing Error*	*Order Imbalance*	*Share Turnover*	*Spread*	*Return* (basis points)	*Volatility*	*Institutional Ownership*	*Market Value* (US$ M)
Never Naked Shorted (0)	0.000%	0.00%	1.43%	0.12%	49.81%	0.01%	0.40%	0.40%	0.03	0.12%	33.91%	$568
1	0.001%	0.01%	1.20%	-0.07%	48.72%	3.97%	0.32%	0.10%	0.00	0.13%	69.05%	$16,639
2	0.003%	0.03%	1.34%	0.08%	50.73%	6.68%	0.44%	0.12%	-0.01	0.13%	70.49%	$12,287
3	0.004%	0.05%	1.19%	0.06%	50.31%	6.79%	0.33%	0.14%	0.05	0.12%	65.58%	$14,844
4	0.005%	0.04%	1.56%	-0.05%	49.94%	6.53%	0.43%	0.13%	0.02	0.14%	64.20%	$5,794
5	0.008%	0.07%	1.46%	-0.13%	47.21%	9.15%	0.44%	0.19%	-0.03	0.14%	61.91%	$4,841
6	0.011%	0.08%	1.59%	-0.24%	50.67%	6.20%	0.42%	0.13%	0.00	0.12%	53.12%	$6,630
7	0.016%	0.10%	1.19%	-0.01%	50.96%	6.23%	0.65%	0.13%	0.03	0.12%	58.68%	$3,053
8	0.026%	0.14%	1.63%	0.11%	51.47%	9.74%	0.58%	0.17%	0.06	0.14%	49.58%	$2,781
9	0.051%	0.17%	1.56%	0.17%	51.86%	11.48%	0.53%	0.19%	0.04	0.13%	31.26%	$1,286
10	0.490%	1.25%	2.47%	0.24%	52.32%	10.64%	0.75%	0.29%	-0.05	0.16%	39.35%	$1,292

Preliminary Analysis

- The extent of naked shorting decreases monotonically with the size of the firm: **Smaller firms have more naked shorting**.
- There is a positive correlation between pricing error (and proportion of positive pricing errors) and naked shorting, suggesting that **naked shorting is more present in relatively overpriced securities.**
- A lower proportion of negative pricing errors are observed for securities with high naked shorting, making it **unlikely that naked shorting is being used to lower prices below fundamental value**.

Highest Decile of Naked Shorting: Behavior of Outstanding Naked Short Ratio, Covered Short Ratio and Trading Volume around day with the highest naked shorting

PE volatility, Covered Short Ratio, OIB are all lower after naked shorting.



Naked Short Selling and Returns

- We use a VAR model to test for causality between naked short selling, covered short selling and daily returns using our 2007 sample.
- VAR Model:

$$\Delta \mathbf{Y}_{i,t} = \mathbf{c}_i + \boldsymbol{\varphi}_i \Delta \mathbf{Y}_{i,t-1} + \boldsymbol{\varepsilon}_{i,t}$$

$$\boldsymbol{\varepsilon}_{i,t} \sim \text{i.i.d.} N(\mathbf{0}, \boldsymbol{\Omega})$$

$$\mathbf{Y}_{i,t} = \begin{bmatrix} New\ Naked\ Short\ Ratio_{i,t} \\ Covered\ Short\ Ratio_{i,t} \\ Return_{i,t} \end{bmatrix}$$

- 2007 Overall Sample, 292 Securities (Results are qualitatively similar for the Most Naked-Shorted sample)

Response - Change	Predictor - Lagged Change			Constant
	NNSR	*CSR*	*Return*	
NNSR	0.04	0.01	<0.01	0.00
	*6.30****	*3.00****	*1.17*	*-2.34***
CSR	0.07	-0.36	<0.01	-0.01
	*6.08****	*-52.49****	*0.64*	*-23.09****
Return	-0.02	-0.02	-0.49	0.00
	-1.40	*-2.41***	*-83.79****	*0.26*

Naked Short Selling and Returns

- Our results show that:
  - there **is strong and significant positive feedback between naked shorting and covered shorting** in the general and most naked shorted samples.
  - **returns are highly negatively related to lagged covered short** selling for the overall sample.
  - **we do not find any significant relationship between returns and lagged naked short selling** for either of the samples.

- Overall, we do not find any evidence that naked short selling depresses stock prices in the short-term.

Causality between Naked Shorting and Market Quality

- To test for causality between naked shorting and measures of market quality, while controlling for interrelationships, we employ **a vector autoregressive model** with additional exogenous variables.
- The variables we include are *Outstanding Naked Short Ratio*, *Covered Short Ratio*, *Abs. Pricing Error*, *Volatility*, *Bid-Ask Spread* and *Order Imbalance*.
- We employ another specification where we use, instead of absolute pricing error, actual pricing error and a dummy variable indicating whether it was negative or positive.

Causality between Naked Shorting and Market Quality

- Model 1 (with Pricing Error) $\Delta \mathbf{Y}_{i,t} = \mathbf{c}_i + \boldsymbol{\varphi}_i \Delta \mathbf{Y}_{i,t-1} + \boldsymbol{\psi}_i \mathbf{X}_{i,t} + \boldsymbol{\varepsilon}_{i,t} \qquad \boldsymbol{\varepsilon}_{i,t} \sim \text{i.i.d.} N(\mathbf{0}, \boldsymbol{\Omega}_1)$

$$\mathbf{Y}_{i,t} = \begin{pmatrix} ONSR_{i,t} \\ CSR_{i,t} \\ PE_{i,t} \\ Volatility_{i,t} \\ Spread_{i,t} \\ OIB_{i,t} \end{pmatrix} \qquad \boldsymbol{\psi}_i \mathbf{X}_{i,t} = \begin{pmatrix} \psi_{i,1,1} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \psi_{i,3,3} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} Positive\ OIB_{i,.t-1} \\ 0 \\ Positive\ PE_{i,t-1} * \Delta ONSR_{i,t-1} \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

- Model 2 (with Pricing Error Volatility) $\Delta \mathbf{M}_{i,t} = \mathbf{c}_i + \boldsymbol{\theta}_i \Delta \mathbf{M}_{i,t-1} + \boldsymbol{\eta}_i \mathbf{N}_{i,t} + \boldsymbol{\xi}_{i,t}$

$$\boldsymbol{\xi}_{i,t} \sim \text{i.i.d.} N(\mathbf{0}, \boldsymbol{\Omega}_2)$$

$$\mathbf{M}_{i,t} = \begin{pmatrix} ONSR_{i,t} \\ CSR_{i,t} \\ PE\ \ Volatility_{i,t} \\ Volatility_{i,t} \\ Spread_{i,t} \\ OIB_{i,t} \end{pmatrix} \qquad \boldsymbol{\eta}_i \mathbf{N}_{i,t} = \begin{pmatrix} \eta_{i,1,1} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} Positive\ OIB_{i.t-1} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

Causality between Naked Shorting and Market Quality

- Determinants of Naked Short Selling (Response Variable: *ONSR*)

2007-Sample	Predictors - Lagged Changes							Other Predictors	
	ONSR	*CSR*	*PE*	*PE Volatility*	*Volatility*	*Spread*	*OIB*	*Positive Lag OIB*	*Constant*
Overall Sample 292 Securities	0.050	0.011	0.004		0.001	-0.003	-0.003	0.027	-0.018
	*6.74****	*2.98****	*1.11*		*0.40*	*-1.18*	*-0.99*	*3.29****	*-3.46****
Most Naked Shorted 202 securities	0.062	0.018	-0.001		-0.002	-0.006	-0.004	0.033	-0.020
	*6.76****	*4.89****	*-0.22*		*-0.51*	*-2.02***	*-1.40*	*3.88****	*-3.72****
Overall Sample 292 securities	0.0487	0.0096		-0.0017	0.0013	-0.0024	-0.0031	0.0256	-0.0164
	*6.79****	*2.75****		*-0.56*	*0.43*	*-0.9*	*-1.23*	*3.25****	*-3.36****
Most Naked Shorted 202 securities	0.062	0.017		0.001	-0.002	-0.006	-0.004	0.032	-0.020
	*6.85****	*4.65****		*0.37*	*-0.72*	*-1.75**	*-1.68**	*3.97****	*-3.84****

Causality between Naked Shorting and Market Quality

- Impact of Naked Short Selling

2007-Sample	Response - Change							
	ONSR	*CSR*	*PE*	*PE* (incremental effect when lag PE > 0)	*PE Volatility*	*Volatility*	*Spread*	*OIB*
Overall Sample 292 Securities	0.050	0.068	0.023	-0.052		-0.014	-0.006	-0.035
	*6.74****	*5.92****	*1.80**	*-2.84****		*-1.38*	*-0.63*	*-2.81****
Most Naked Shorted 202 securities	0.062	0.108	0.015	-0.053		-0.029	-0.033	-0.020
	*6.76****	*6.05****	*0.84*	*-2.06***		*-2.01***	*-2.57***	*-1.20*
Overall Sample 292 Securities	0.049	0.069			-0.010	-0.020	-0.007	-0.034
	*6.79****	*6.06****			*-1.04*	*-1.97***	*-0.80*	*-2.73****
Most Naked Shorted 202 securities	0.062	0.102			-0.030	-0.039	-0.032	-0.018
	*6.85****	*5.68****			*-2.26***	*-2.73****	*-2.59****	*-1.06*

Economic Significance

For the general sample of NYSE securities over the first half of 2007, a 2 standard deviation increase in naked shorting leads approximately to:

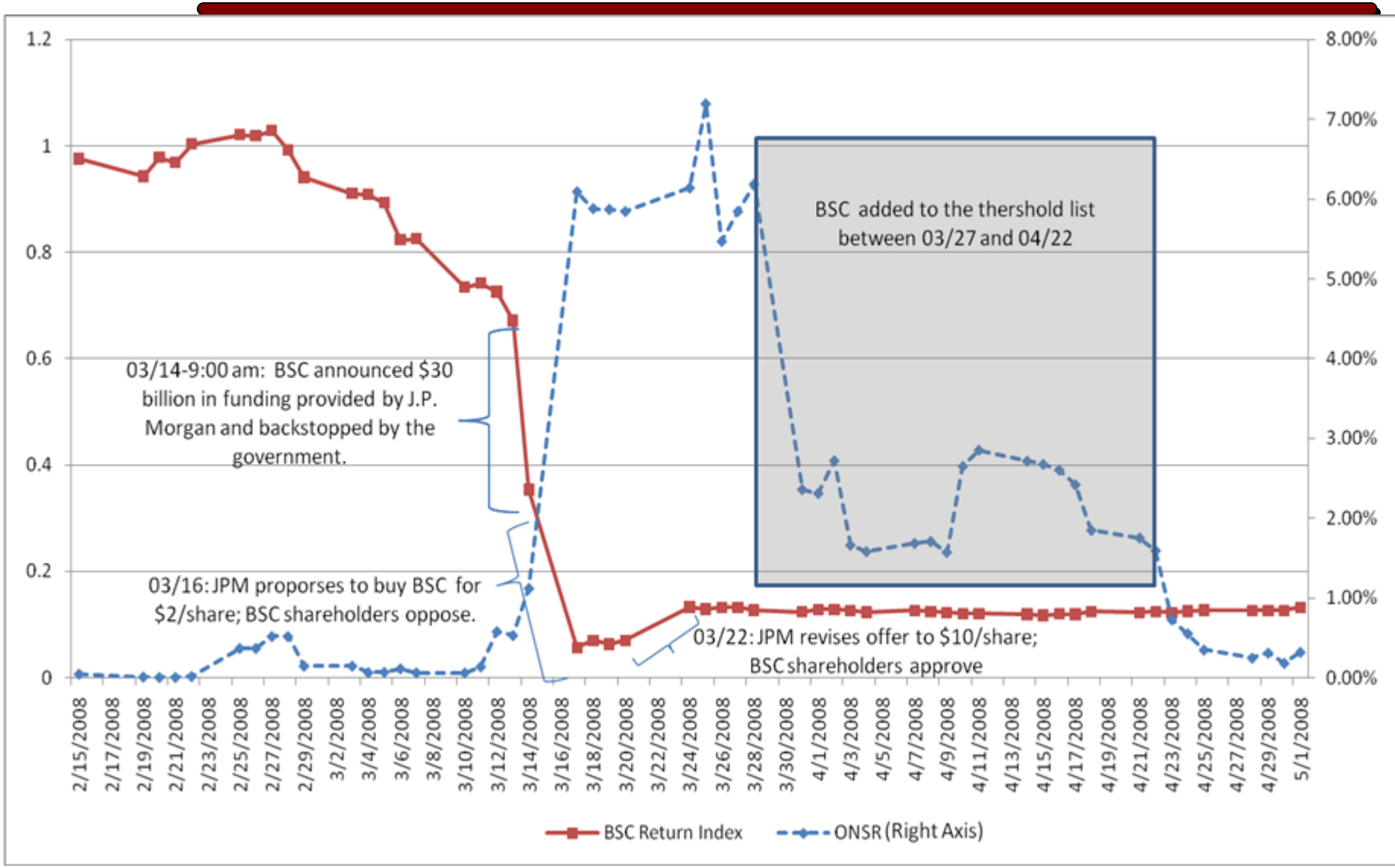
- 4% reduction in stock price returns volatility,
- 1% reduction in bid-ask spreads,
- 50% decline in order imbalances,
- 3.5% decline in absolute pricing error and
- 30% decline in positive pricing errors.

Economic Significance

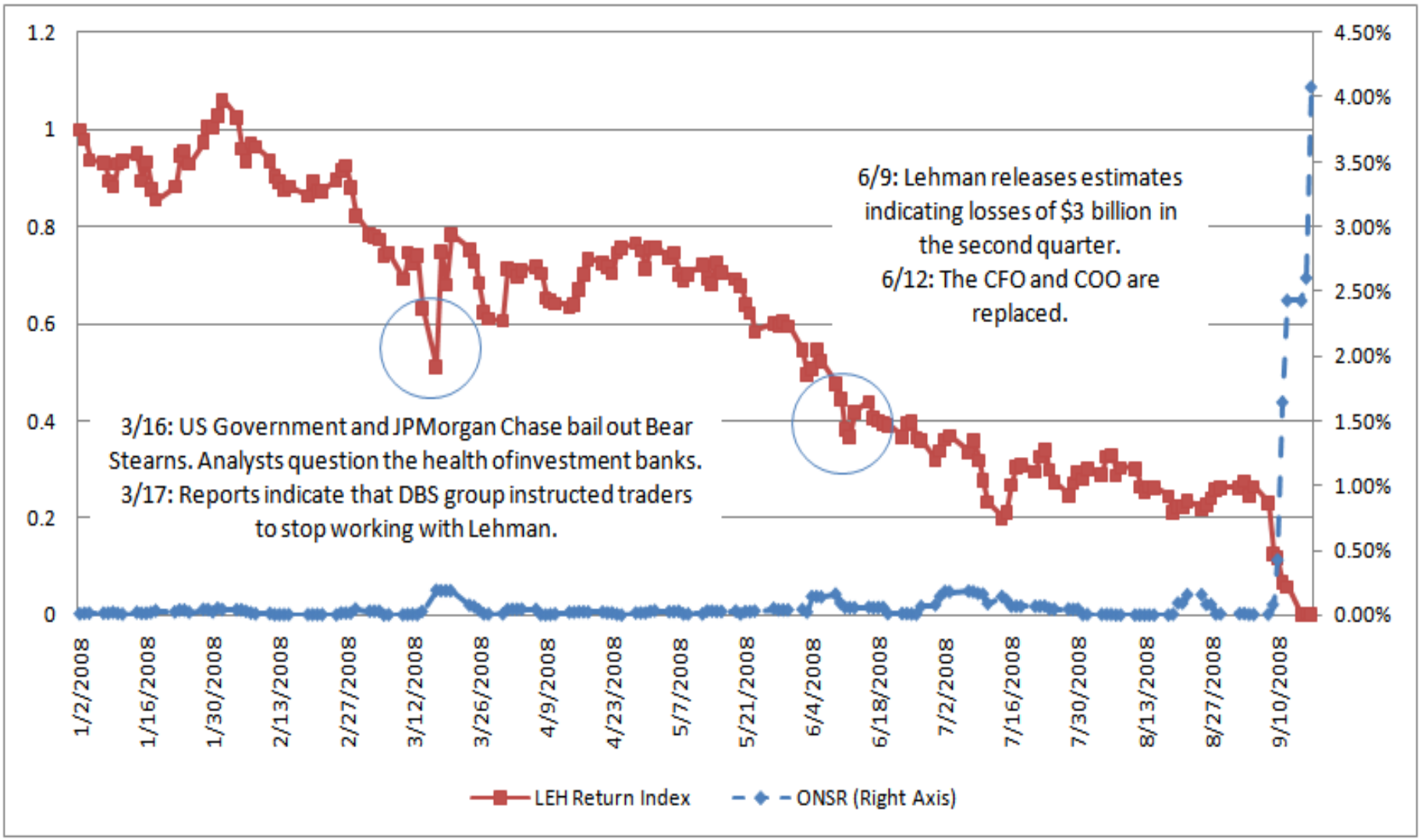
For the sample of most-heavily naked-shorted NYSE securities over the first half of 2007, a 2 standard deviation increase in naked shorting leads approx. to:

- 3.4% reduction in stock price returns volatility,
- 1% reduction in bid-ask spreads,
- 10% decline in order imbalances,
- 4% decline in absolute pricing error and
- 4.5% decline in positive pricing errors.

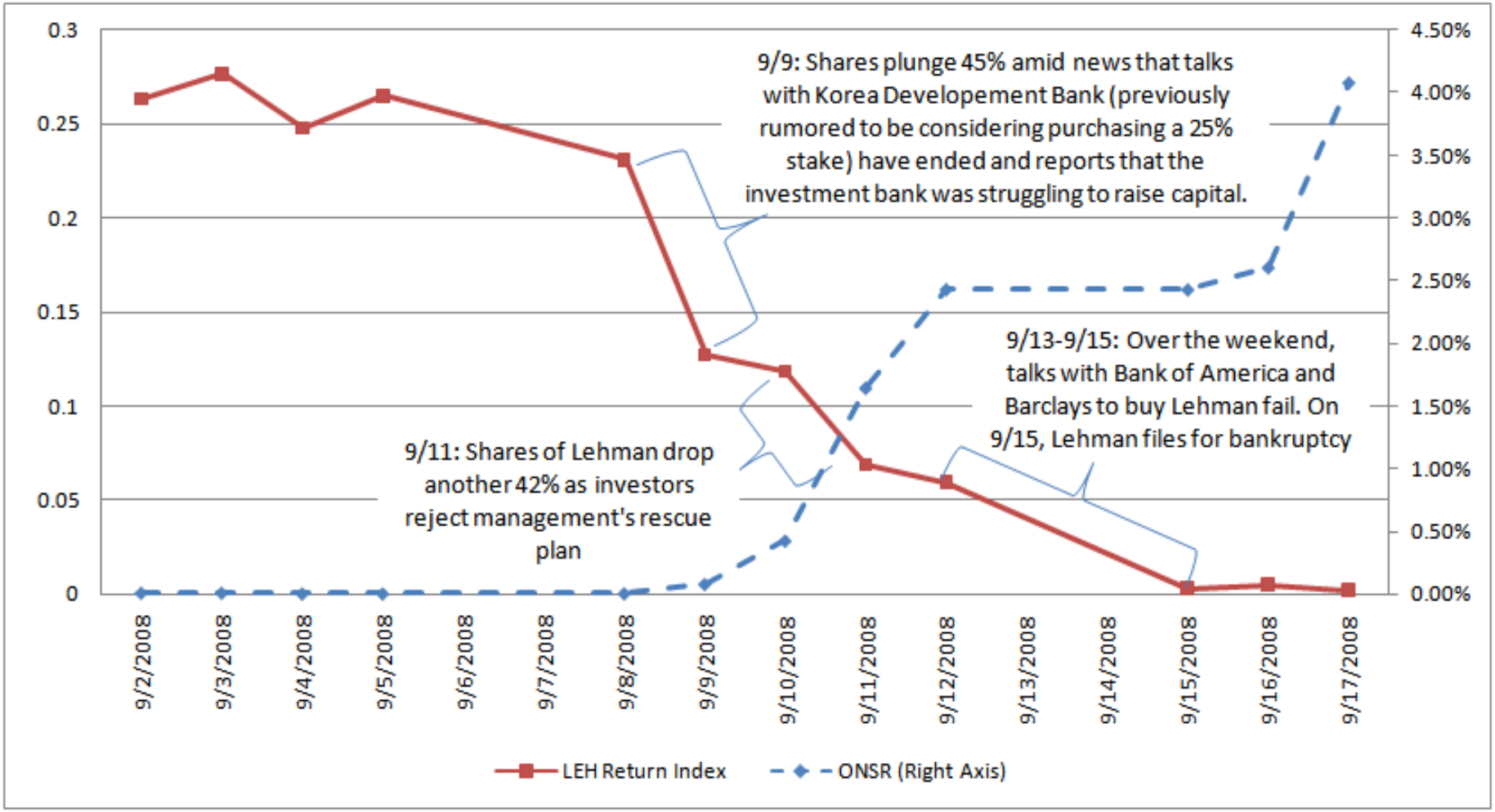
The Case of Bear Stearns
Were Naked Short Sellers to Blame?



The Case of Lehman Were Naked Short Sellers to Blame?



The Case of Lehman Were Naked Short Sellers to Blame?



Credit Rating Downgrades Were Naked Short Sellers to Blame?

Naked short-sellers have been alleged to engage in (manipulative) naked short selling by creating conditions that trigger credit downgrades specifically to profit not just from the downward price spiral but also from linked credit default swap positions on the associated stock.

Hence, we analyze Naked Short Selling around long-term issuer credit rating downgrades by S&P for 17 financial firms over the year 2008.

Event Window	N	Mean Cumulative Abnormal ONSR	t-stat	
(-20,-1)	21	-0.36%	-1.93	*
(-10,-1)	21	-0.27%	-2.03	**
(-5,-1)	21	-0.15%	-1.64	
(0,0)	21	-0.02%	-0.57	
(+1,+5)	21	0.32%	3.44	***
(+1,+10)	21	0.57%	4.25	***
(+1,+20)	21	0.67%	3.56	***

The *t*-statistic for significance of the mean is computed making use of the historic estimate of the standard error adjusted for date clustering (and computed over the estimation period of 100 trading days ending 20 days prior to the credit rating downgrade)

SEC Naked Short Selling Ban

The SEC banned naked short selling of shares of 19 financial institutions between July 21st and August 12th, 2008.

We find matched firms (by SIC and Market Cap) and form two equal weighted portfolios, one with the affected securities and one with matches to control for time-period specific changes.

Changes in abs. pricing error, volume, and bid-ask spread is consistent with earlier conclusions

Reduction in ONSR implies that SEC's ban successfully curtailing naked shorting.

Variable	Event
Abs. PE	+ve***
Volume	-ve***
Spread	+ve
Returns	-ve
ONSR	-ve***

Reg SHO and the Impact of Naked Short Selling

All our previous analyses are based on data from the Post-SHO period, where there are more checks and balances on naked short sales.

1. The locate requirements are expected to curtail the incidence of naked short sales. Regulation SHO requires a broker-dealer to have reasonable grounds to believe that the security can be borrowed so that it can be delivered on the date delivery is due before effecting a short sale order in any equity security. This "locate" must be made and documented prior to effecting the short sale.

2. The close-out requirements are expected to make naked short sales costlier. One of the main features of Reg. SHO is that after a stock is excessively naked shorted, it is placed on a threshold list. Once a stock is on the threshold list, all its previous FTDs should be delivered forthwith. This increases the expected costs of “buy-in”.

Reg SHO and the Impact of Naked Short Selling

Parameter		2004	2007	2008	Difference (2007-2004)		Difference (2008-2004)		Difference (2007-2008)	
					Estimate	T-Value	Estimate	T-Value	Estimate	T-Value
Coefficient of Mean Reversion for Negative PE	α_{NEG}	0.58 *0.02*	0.64 *0.02*	0.64 *0.03*	0.06	1.76*	0.06	1.79*	0.00	0.03
Coefficient of Mean Reversion for Positve PE	$\alpha_{NEG} + \alpha_{INC\_POS}$	0.62 *0.02*	0.65 *0.02*	0.62 *0.03*	0.03	0.64	0.00	-0.06	-0.03	-0.70
Coefficient of Mean Reversion for Negative OIB	β_{NEG}	0.68 *0.06*	0.89 *0.06*	0.81 *0.02*	0.22	2.63***	0.13	2.43***	-0.08	-1.25
Coefficient of Mean Reversion for Positve OIB	$\beta_{NEG} + \beta_{INC\_POS}$	0.71 *0.01*	0.81 *0.01*	0.83 *0.01*	0.09	5.04***	0.12	6.09***	0.03	1.36

$$\Delta Pricing\ Error_{i,t} = \gamma_i + \alpha_{NEG,i} Pricing\ Error_{i,t-1} + \alpha_{INC\_POS,i} Pricing\ Error_{i,t-1} * Positive\ PE_{i,t-1} + \phi_{1,i}\Delta Spread_{i,t} + \phi_{2,i}\Delta Volatility_{i,t} + \varepsilon_{i,t}$$

$$\Delta OIB_{i,t} = \gamma_i + \beta_{NEG,i} OIB_{i,t-1} + \beta_{INC\_POS,i} OIB_{i,t-1} * Positive\ OIB_{i,t-1} + \phi_{1,i}\Delta Spread_{i,t} + \phi_{2,i}\Delta Volatility_{i,t} + \varepsilon_{i,t}$$

Studying the most naked shorted decile of stocks , we find that

- Negative PE reverts faster in the Post-SHO period (2007 and 2008) than in the Pre-SHO period (2004).
- OIB reverts faster in the Post-SHO period (2007 and 2008) than in the Pre-SHO period (2004).

Conclusions

- Naked Short Selling is fairly pervasive. It affects the great majority of traded securities, at least on the NYSE.
- In spite of trying hard to try and find negative consequences of naked short selling, we have been unable to do so.
- On the contrary, the impact on market quality is unequivocally positive: naked short sellers appear to be liquidity providers who reduce order imbalances, stabilize markets and reduce the mispricing of overvalued securities.

Conclusions

- The positive impact on market quality exists across time periods and across different samples in post-SHO regime.
  - It exists for the general sample (2007).
  - It exists in the most heavily naked-shorted decile of securities.
  - It exists for the ten most heavily naked-shorted securities.
  - It exists in 2008, that is under stressed market conditions.

Conclusions

- We analyze naked shorting around the demise of Bear Stearns, Lehman, Merrill and AIG, and find no evidence indicating that the stock price decline was triggered by “bear raids” of naked short sellers. Instead, naked short selling became significant only after news of its troubles became public.
- We find that naked shorting *only* responded to credit downgrades of financial institutions in 2008
- Consistent with all of the above, the SEC ban on naked short selling reduced market quality, though it did succeed in severely curtailing naked short selling.

Conclusions

- Finally, we find that Reg SHO was successful in curbing manipulative naked short selling.

- Overall, the highly negative regulatory and media concern about naked short selling is not supported by our empirical evidence.

Support slides

Measuring Naked Shorting

- While every naked short sale does, by definition, result in an FTD at the level of naked short trade, it may not necessarily get reflected in the FTD data provided by the SEC, since these data are constructed by aggregating across brokers (rather than trades) after all trades of a particular broker are netted out.
  - an FTD trade may not show up in the data if the broker is able to internally offset her deliverables with undelivered receivables for clients who have coincidentally failed to receive the same stock on the same day from another naked short seller.
  - However, once again, we cannot see how fortuitous matches of this nature at the level of individual brokers can be systematically related to the aggregate variables driving any of our hypotheses, and therefore, we believe that such errors may add noise but should not affect any of our conclusions.