Fallen Angels and Price Pressure

Brent W. Ambrose
Penn State
Jean Helwege
South Carolina
Kelly N. Cai
U. Michigan Dearborn

PENNSTATE
SMEAL College of Business

Fallen angels and price pressure

- When bonds lose their investment grade status from the rating agencies, institutions are forced to sell them
  - Regulations are stricter for insurance companies and pension funds than for mutual funds and other institutions.
  - Regulatory arbitrage suggests it is the last investment grade rating that triggers rules on holdings
  - Ambrose, Cai and Helwege (2008) show that fallen angels are sold by insurance companies far more often than other bonds
- Rating agencies are often slow to act so a large number of downgrades are met with no reaction from investors
  - Weinstein (1977), Hand, Holthausen and Leftwich (1992)
- This allows us to look at price pressure effects of selling when information effects are absent

Demand curves for securities

- Many papers attempt to determine whether demand curves for securities slope downward.
  - Asset pricing models like the CAPM say the price is invariant to the quantity sold.
  - Market microstructure theory (Kyle (1985)) says selling a large quantity in the open market is likely to involve a discount:
    - Dealers are concerned about buying at too high a price from an informed trader
- Block trades, IPO lock-ups, etc suggest that selling a large equity stake involves significant downward pressure on stocks
  - Scholes (1972), Mikkelson and Partch (1985), Keim and Madhavan (1998), Clarke, Dunbar and Kahle (2004), Field and Hanka (2001), Corwin (2003), Ofek and Richardson (2000) and Schultz (2006)).

How does the sale of a security affect its price?

- Price pressure occurs when a large volume of sales reduces the price of a security or a large amount of buying increases the price
  - Pure price pressure occurs even when the trading is unconnected to future performance or expectations of future performance
- We want an experiment where the only thing that changes is the amount sold or bought
- Even if no information, dealers may worry that there are information effects.
  - Sunshine trading (Admati and Pfleiderer (1991))
  - Roell (1990)

Our experiment

- Find bonds that are sold by insurance companies after a downgrade to speculative-grade
  - Must be junk because of regulations (other changes don't count)
- Separate bonds into cases of no information and negative information based on stock reaction
  - "No information" is when the stock does not react significantly
    - Likely reflects that the stock reacted earlier to the bad news
- Examine trading patterns to see if insurers try to hide
  - The sunshine effect
- Look at bond prices before and after downgrade
  - Negative stock reaction firms should have both price pressure and info
  - No stock reaction firms should just suffer from price pressure

Data

1. Identify fallen angels from FISD (1995-2008)
   - Moody's, S&P , Fitch and Duff and Phelps data
   - 2337 bonds downgraded by Moody's and S&P
   - 1476 bonds downgraded by all agencies that count
2. Stock data from CRSP
3. Watchlist and other rating data from FISD
4. Bond sales and prices from FISD
5. Bond index data from Lehman/BGI indexes

Price Pressure & Dealer Liquidity

- Insurers should have an easier time selling their fallen angel bonds when everyone understands that there is no information element to their trades (sunshine trading)
- We construct 3 measures of dealer liquidity:
  - Ability to predict future bond sales (Hite & Warga, 1997)
    - On Watchlist
    - Estimate downgrade probability
  - Adverse selection component in issuer's stock
  - Proxy for bond liquidity
    - Issue size
    - Age
    - Time to maturity
    - Zero trading days

1.A On Watchlist

	Full Sample		No Information Group	
Last IG Agency	% of Bonds	% on WL	% of Bonds	% on WL
Duff & Phelps	1.51	0.0	2.2	0.0
Fitch	43.4	2.2	44.6	2.2
Moody's	27.6	16.6	24.3	14.3
S&P	26.3	0.9	28.9	0.9
Total	100.0	5.86	100.0	4.71

Less than 6% of the fallen angels were on a Watchlist, indicating that it might be difficult for the market to prepare for the last rating action.

1.B Probability of final downgrade

	Model 1	
	Coefficient	Chi-Square
Intercept	-0.13	1.74
Watchlist	1.91	57.58
Junk Spread	-0.08	49.21
NBER Recession	-0.17	1.34
Previous DG	0.08	0.25
Capitalization	-0.01	1.28
Low CAR	1.61	138.27
N	1586	
Pseudo R Square	0.14	

Statistics of Ex Ante Probability of Downgrade within 180 Days

Number	Mean	Std	Max	Min	Median
744	65%	17.9%	98%	25%	68%

2. Adverse Selection

- Follow Gibson, Singh, and Yerramilli (2003) to separate out the adverse selection component of the firm's stock price bid-ask spread.
  - Assume that high stock adverse selection implies high adverse selection in bonds.

Number	Mean	Std	Max	Min	Median
774	0.086	0.065	0.339	0.000	0.071

  - Most firms have very little adverse selection component in their stock trades.

3. Liquidity measures

	Mean	Std	Max	Min	Median
% of days w/0 volume	96.7	5.9	100	54.7	98.5
Total trading volume ($M)	10.3	26.4	372	0.0	0.2
Total number of trades	3.7	8.4	95	0.0	1
Offering Amount ($M)	330	505	5000	5	200
Bond Age at Downgrade	4.9	3.8	25.7	0.1	3.9
Time-to-Maturity	12.7	11.98	100.01	0.2	10.0

- As with most corporate bonds, fallen angels are not very liquid.
  - Majority do not trade on any given day
  - # and volume of trades per month is low

Sunshine Trading:
Sell transactions before & after downgrade

			1m before DG		1m after DG		Diff.
		N	Mean	Std	Mean	Std	t-stat.
No Info bonds	#	774	0.85	2.91	1.24	4.71	-1.93
	$	774	0.01	0.02	0.01	0.06	-3.05
Negative info bonds	#	233	2.63	6.98	3.24	5.89	-1.02
	$	233	0.01	0.02	0.02	0.04	-2.59

- Sunshine trading implies that sales after downgrade should be greater for no information group.

Sunshine Trading: Sell transactions before & after downgrade

			1m before DG		1m after DG		Diff.
		N	Mean	Std	Mean	Std	t-stat.
Not on WL	#	734	0.87	2.97	1.15	4.5	-1.42
	$	734	0.01	0.02	0.01	0.06	-2.84
On WL& 1 IG rating	#	40	0.60	1.24	2.83	7.21	-1.92
	$	40	0.01	0.02	0.02	0.05	-1.30

- Trading for bonds on Watchlist much higher after downgrade.

Bond Returns and Forced Selling

- Compare downgrades' effects on bonds with negative information and those without information
- Consider whether bond returns are significantly different from zero
  - Adjusted returns different if price pressure exists
    - No info group should show smaller absolute bond returns than negative information group
    - Less impact on price if dealers view insurers' trade as uninformed
- To avoid information effects use a fairly narrow window of two weeks before or after the downgrade date
  - Should have few information effects but remember stock return was only investigated over three day window

Bond returns over 2 weeks around DG

	Fallen Angels Identified Based on Four Agencies		
	Negative Info Group	No Info Group	Diff. in means t-stat.
Panel A: [-14, 13] window			
Number of Bonds	53	67	
Raw Returns	-11.42%	-1.21%	(-2.66)
	(-3.07)	(-1.23)	
Adjusted Returns	-11.69%	-1.30%	(-2.77)
	(-3.23)	(-1.33)	

- Information effects are large, price pressure effects are small.

Price pressure and liquidity

- So far, our evidence suggests that price pressure effects are minimal.
- If any price pressure exists, ought to be greater for bonds with more selling pressure
  - Look at amount of selling across no info bonds
- If any price pressure exists, ought to be more important for less liquid bonds
  - Look at liquidity variation in no info bonds

$$MARK_{i,n} = \alpha + \beta' LIQ_{i,n} + \varepsilon_i$$

Can liquidity differences explain no info bond returns?

$$MARK_{i,n} = \alpha + \beta' LIQ_{i,n} + \varepsilon_i$$

Liquidity Factor	Coefficient
% zero volume days	Not Significant
Trading volume	Not Significant
Number of trades	Not Significant
Offering amount	Not Significant
Bond age	Significant (Negative)
Time to maturity	Not Significant

Can differences in selling pressure explain no info bond returns?

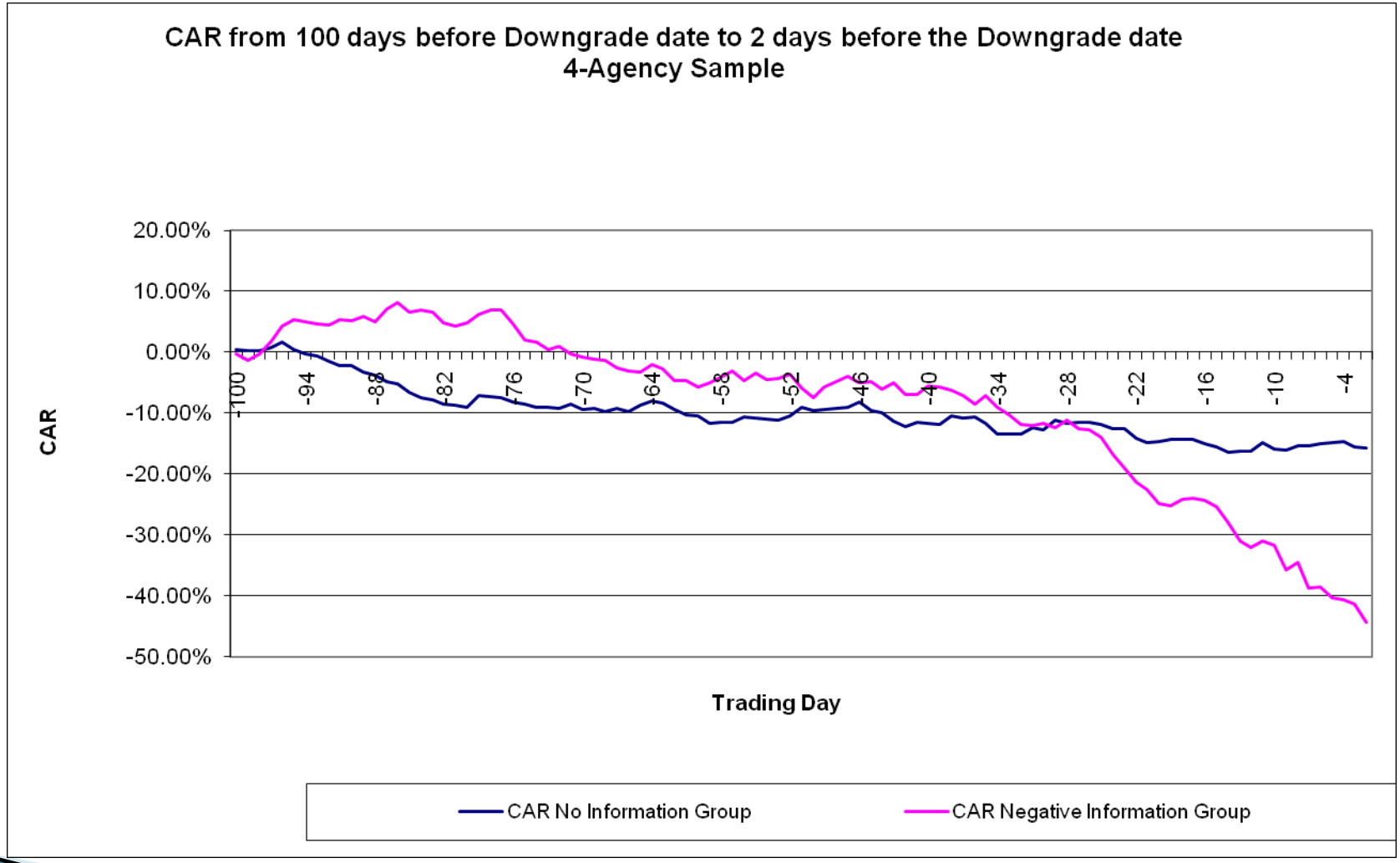
$$MARK_{i,n} = \alpha + \beta' SP_{i,n} + \varepsilon_i$$

Sales Pressure Factor	Coefficient
Number of sell transactions in [-1,30]	Not Significant
Volume of sell transactions in [-1,30]	Not Significant
Number of sell transactions on after_date	Not Significant
Volume of sell transactions on after_date	Not Significant

Robustness: Is "no info" really no info?

- Classification of the stocks is based on std dev in earlier period. If std dev high then easier to count firms as no info.
  - Stock returns for neg info group sharply lower than for no info group
- No info group in the 4 agency classification has downgrade later in time on average:
  - Among neg info in 4 agency sample, over 75% have downgrade on same day as Moody's and S&P
  - Among no info in 4 agency sample, only 61% have downgrade on same day as Moody's and S&P

Estimation error in the sample standard deviation of stock returns



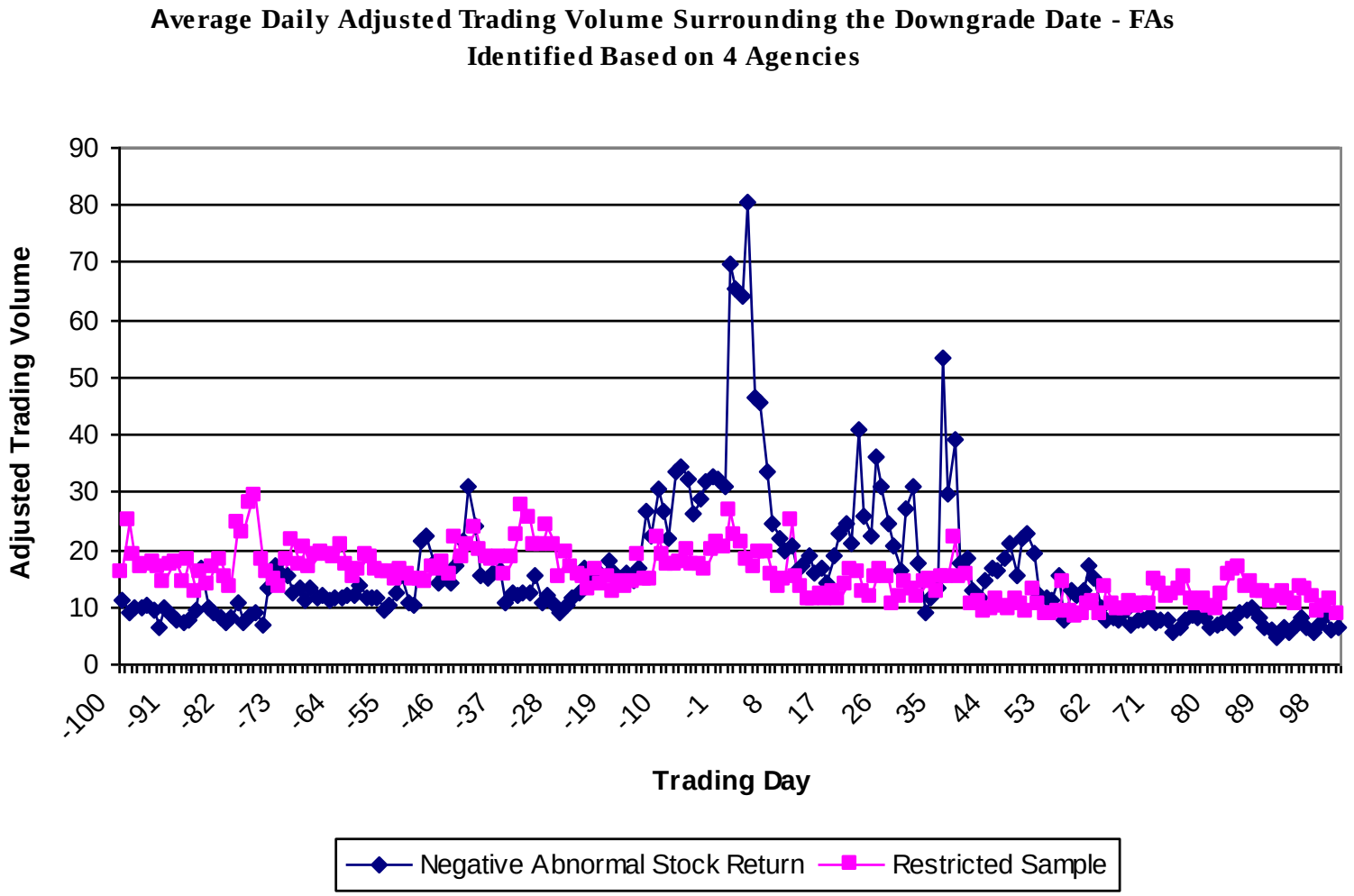
Robustness: Stock liquidity

- Potentially some stocks are really no info stocks but have major price pressure effects – we would put them in the wrong group and their price pressure on bonds would show up as info effects
  - All bonds were investment grade so all were in the category of "large cap"
- Stocks are under much less regulatory pressure because insurance companies and pension funds have a much smaller share of the stock market
- If stocks suffer from selling pressure ought to see a bounce-back in a fairly short period of time

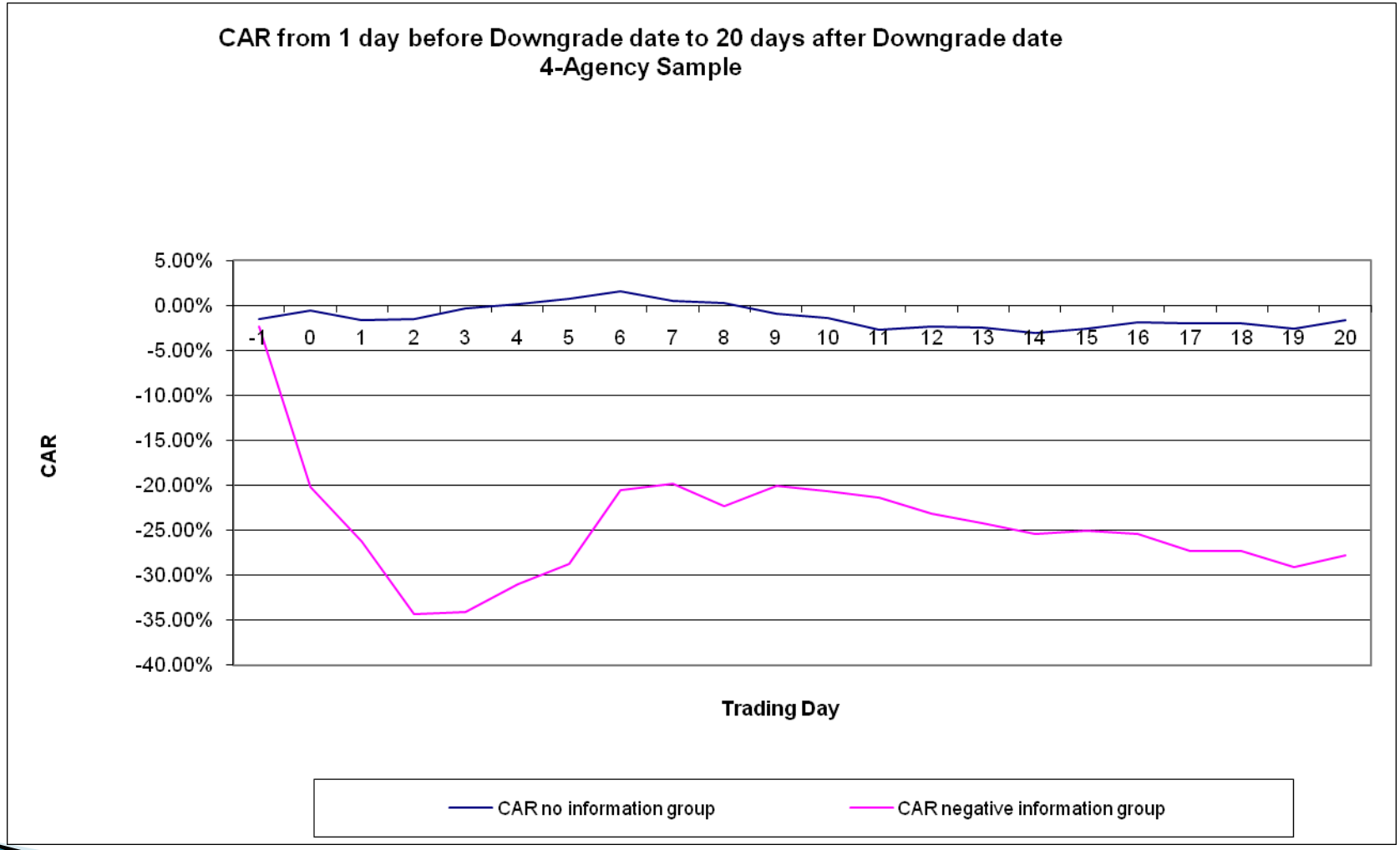
Difference in negative info and no info stocks

	Fallen Angels Identified Based on Four Agencies		
	Negative Info Group	No Info Group	Diff. in Means t-stat.
Number of Stocks	14	28	
Abnormal Stock Return (-1,+1)	-13.52%	0.05%	
Zero Trading Days	0	0	
Adjusted Trading Volume	55.49	23.31	(1.46)
	(2.63)	(3.59)	
Bid-Ask Spread from CRSP (%)	1.20	0.64	(1.37)
	(3.12)	(4.49)	
TAQ Bid-Ask Spread [-1,1]	0.0578	0.0545	(-0.30)
	(-97)	(-193)	

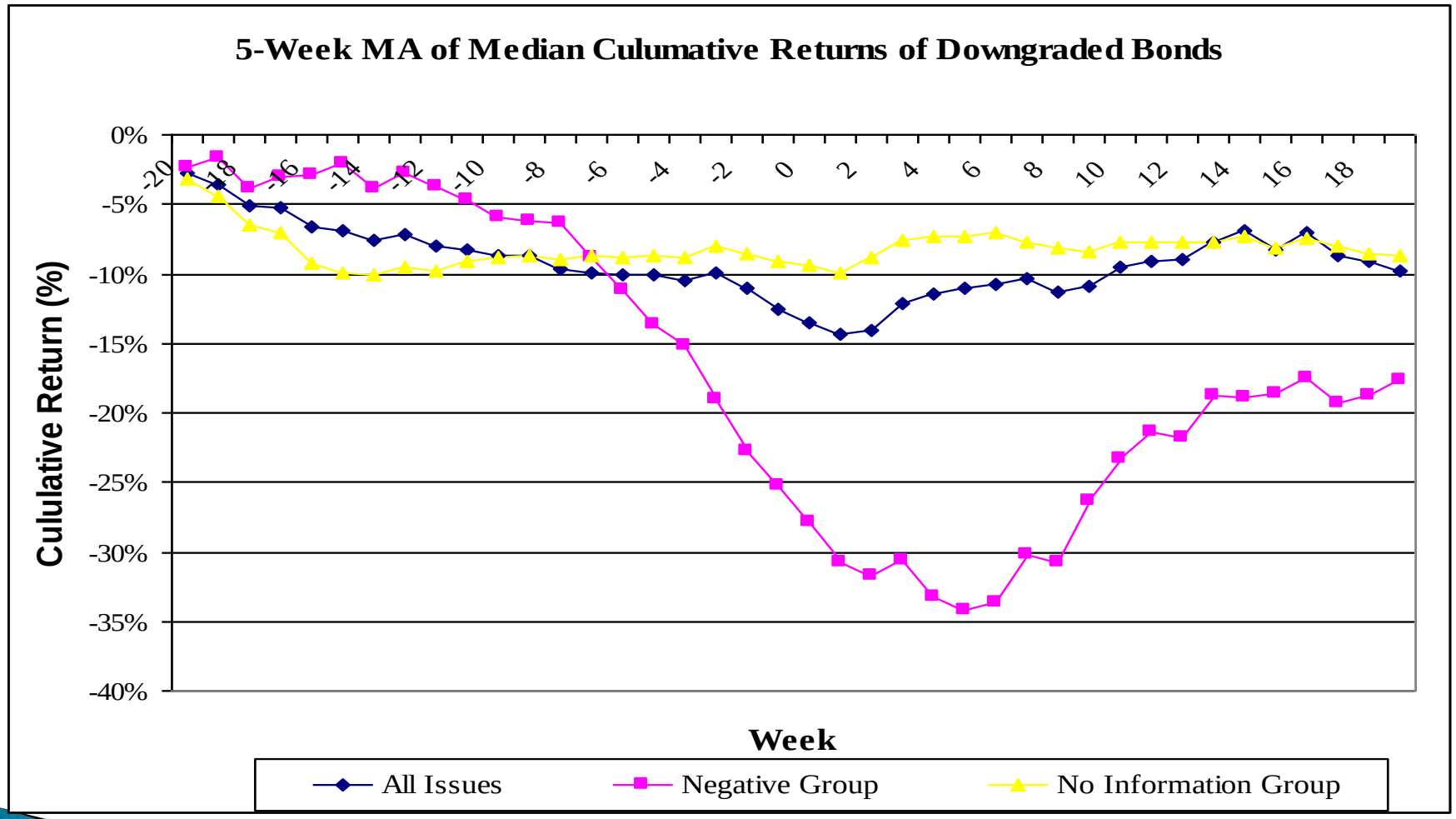
Liquidity differences in negative info and no info stocks



Temporary price pressure on the neg info stocks?



Temporary price pressure on bonds?



Conclusion

- Absent information effects, expect flat demand curve
  - Information about fundamentals already out
  - Dealers know the insurers are not informed traders
  - Often easy to predict that the bonds will become FA
- Clean test of selling where no info-related motivation
  - Regulations rely on ratings, which are slow in many cases
  - Separate out the slow adjustment cases by looking at the stock returns at the downgrade announcement
  - When the information is already out the downgrade triggers selling without any information effects
- We don't find much price pressure
  - Four agency is more relevant for "forced selling" and it shows no price pressure
- Price reversals only exist for negative info bonds