

Costs and Benefits of Regulatory Interventions in Stock Markets: A Case of Minimum Public Shareholding Rule in India

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Amendment to Securities Contracts (Regulation) Rules, 1957 (June 2010)

- Mandates that:
 - Every listed non-PSU firm shall maintain public shareholding of at least **25%**
 - Those firms with less than **25%** public shareholding at the time of this enactment shall increase their public shareholding to at least 25%, within a period of three years
 - Effective cutoff date for compliance: 30 Jun 2013
 - Compliance to be implemented and monitored by SEBI
- In case of **IPOs** post 30 Jun 2010:
 - 10% public float at the time of listing
 - To be raised to 25% over 3 years from time of listing



Motivation for MPS Rule

A high float would

- Provide liquidity to investors
- Help discover fair prices (diversity of opinion; information acquisition)
- Curb price manipulation (SCRA 1956)
- Promote redistribution of wealth (more retail participation)
- ➔ Reduce cost of capital and enhance value while protecting small investors

But

- Dis-incentivize promoters/private enterprise

Key takeaway:

- **Float balances the interests of promoters and public**
- **But is it at the optimal level?**



Key Questions

- Is there empirical evidence to justify such a policy?
 - Do liquidity and price discovery depend on float? (Ex-ante perspective)
- Impact of the policy change
 - Magnitude of the issue: How many firms were affected by the policy?
 - Evidence from data
- Did the policy work for the firms that complied?
 - Ex-post analysis of changes in liquidity and price discovery measures.
- Is there a need to revisit the policy?
- How could the policy be revised?

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Liquidity Measures

- Amihud Illiquidity measure: $|Returns|/Volume$
 - Measures price impact
- Turnover
 - Daily shares traded/outstanding shares
- Trading Frequency (percentage of days traded)
 - Inverse measure of non-trading
- Roll's serial covariance: $2\sqrt{(-Scov)}$
 - Effective spread measure

Price Discovery Measures

- Intraday Volatility (Garman Klass estimator)
 - Transient volatility or fundamental information (French and Roll (1986))

$$\sqrt{\sum_{i=1}^n \left\{ \frac{1}{2} \left[\log \left(\frac{H_i}{L_i} \right) \right]^2 - (2 \log 2 - 1) \left[\log \left(\frac{O_i}{C_i} \right) \right]^2 \right\}}$$

n=no. of traded days in quarter, H=Day's High price, L=Day's Low price; O=Day's Open price; C=Day's Close price

- Variance ratio
 - Relative importance of fundamental volatility and transient volatility in the price discovery process

$$\frac{\text{Variance of 3 years' Monthly Returns}}{\text{Scaled Variance of 3 years' Daily Returns}}$$

Assumption: 250 trading days in a year

Ex-Ante Analysis (2004-2010): Amihud Illiquidity vs. Float + controls

Amihud Illiquidity	Coef.	t	P > t
Intercept	26.48	14.85	0.000
Float	-0.10	-7.30	0.000
Market Cap	-3.80	-20.54	0.000
Inverse Price	10.34	4.44	0.000
Age (years)	0.13	3.92	0.000
EBITDA (%)	0.00	1.72	0.086
Price-to-book	0.32	5.69	0.000
Listed on Both Exchanges	-1.20	-2.50	0.012
Public Sector	6.35	6.28	0.000
Foreign Firms	-1.03	-1.33	0.185
Business Group	-1.41	-2.74	0.006



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Regression of liquidity variables on Float + controls – Daily Turnover

Daily Turnover	Coef .	Robust Std. Err .	t	P> t
Intercept	-0.0048123	0.0004453	-10.81	0.000
Float	0.0000737	3.07e-06	24.03	0.000
Market Cap	0.0006672	0.0000433	15.42	0.000
Inverse Price	-0.0028200	0.0002167	-13.02	0.000
Age (years)	-0.0000721	8.51e-06	-8.47	0.000
EBITDA (%)	1.01e-07	5.05e-07	0.20	0.841
Price-to-book	-0.0000322	0.0000138	-2.34	0.020
Listed on Both Exchanges	0.0012480	0.0001259	9.91	0.000
Public Sector	-0.0022228	0.0003124	-7.13	0.000
Foreign Firms	-0.0010406	0.0001768	-5.89	0.000
Business Group	-0.0004159	0.0001477	-2.82	0.006





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Regression of liquidity variables on Float + controls – Trading Frequency

% of Trading Days	Coef .	Robust Std. Err .	t	P> t
Intercept	0.6719083	0.0148543	45.23	0.000
Float	0.0010267	0.0001222	8.40	0.000
Market Cap	0.0354350	0.0016546	21.42	0.000
Inverse Price	0.0152878	0.0106031	1.44	0.149
Age (years)	-0.0017759	0.0002969	-5.98	0.000
EBITDA (%)	-0.0000419	0.0000282	-1.48	0.138
Price-to-book	-0.0042998	0.0005830	-7.37	0.000
Listed on Both Exchanges	0.0233731	0.0042085	5.55	0.000
Public Sector	-0.0533604	0.0104025	-5.13	0.000
Foreign Firms	0.0292673	0.0069819	4.19	0.000
Business Group	0.0187486	0.0043600	4.30	0.000





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Regression of liquidity variables on Float + controls – Roll's Covariance

Roll Covariance	Coef .	Robust Std. Err .	t	P> t
Intercept	2.9101950	0.7930635	3.67	0.000
Float	-0.0127233	0.0035489	-3.59	0.000
Market Cap	-0.1123913	0.0294866	-2.81	0.005
Inverse Price	-1.6274210	0.5790190	-2.81	0.005
Age (years)	0.0208864	0.0063482	3.29	0.001
EBITDA (%)	0.0017014	0.0008610	1.98	0.048
Price-to-book	0.0671370	0.0254512	2.64	0.008
Listed on Both Exchanges	-0.6280931	0.7089148	-0.89	0.376
Public Sector	-0.1280925	0.2575943	-0.50	0.619
Foreign Firms	0.7502089	0.2812064	2.67	0.008
Business Group	0.2219111	0.1111952	2.00	0.046





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We observe huge drop in observations in this regression

Regression of liquidity variables on Float + controls – Garman Klass Volatility

Garman Klass Volatility	Coef .	Robust Std. Err .	t	P> t
Intercept	0.0029856	0.0113479	0.26	0.792
Float	0.0007198	0.0001001	7.19	0.000
Market Cap	0.0206711	0.0013029	15.87	0.000
Inverse Price	0.0427852	0.0113844	3.76	0.000
Age (years)	-0.0019275	0.0002390	-8.06	0.000
EBITDA (%)	-7.89e-06	0.0000239	-0.33	0.741
Price-to-book	-0.0039674	0.0004398	-9.02	0.000
Listed on Both Exchanges	0.0145726	0.0042873	3.40	0.001
Public Sector	-0.0610108	0.0101417	-6.02	0.000
Foreign Firms	0.0112067	0.0059494	1.88	0.060
Business Group	0.0157762	0.0040587	3.89	0.000





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Regression of liquidity variables on Float + controls – Variance Ratio

Variance Ratio	Coef .	Robust Std. Err .	t	P> t
Intercept	0.5435165	0.0581121	9.35	0.000
Float	0.0041899	0.0006137	6.83	0.000
Market Cap	0.0475465	0.0069500	6.84	0.000
Inverse Price	0.4997154	0.0745341	6.70	0.000
Age (years)	-0.0039874	0.0014743	-2.70	0.007
EBITDA (%)	-0.0005173	0.0001410	-3.67	0.000
Price-to-book	0.0212333	0.0032417	6.55	0.000
Listed on Both Exchanges	-0.1615085	0.0271607	-5.95	0.000
Public Sector	-0.1229737	0.4879570	-2.52	0.012
Foreign Firms	-0.1415044	0.0353757	-4.00	0.000
Business Group	0.0055943	0.0249659	0.22	0.823





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We observe huge drop in observations (~50%) in this regression

Ex-ante Analyses Results (2004-2010): Liquidity and Price Discovery vs. Float

Measure	Coef . For Float	t	P> t
Amihud Illiquidity	-0.1053	-7.30	0.000
Daily Turnover	0.0000	24.03	0.000
% Trading Days	0.0010	8.40	0.000
Roll's Covariance	-0.0127	-3.59	0.000
Garman Klass Volatility	0.0007	7.19	0.000
Variance Ratio	0.0041	6.83	0.000





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Key Takeaway:

- Yes, there is empirical evidence to justify the policy
- A higher float can help improve liquidity and price discovery

Key Questions

- Is there empirical evidence to justify such a policy?
 - Do liquidity and price discovery depend on float? (Ex-ante perspective) **YES!**
- **Impact of the policy change**
 - **Magnitude of the issue: How many firms were affected by the policy?**
 - **Evidence from data**
- Did the policy work for the firms that complied?
 - Ex-post analysis of changes in liquidity and price discovery measures.
- Is there a need to revisit the policy?
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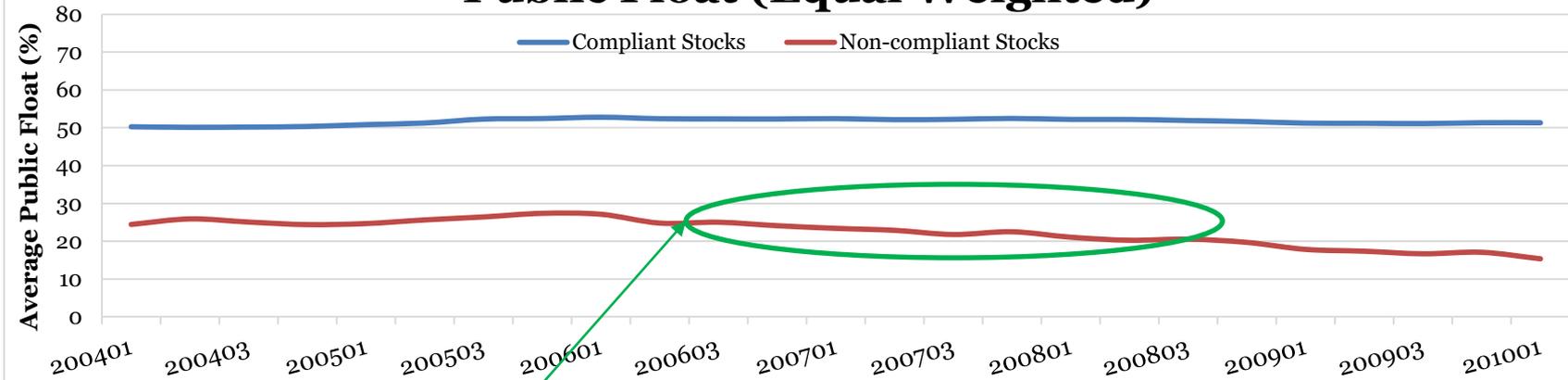
How Many Firms were Impacted?

Compliance Trend (Pre vs. Post)				
		Jun 2013		
		Compliant	Not Compliant	Total
Mar 2010	Compliant	2,769	15	2,784
	Not Compliant	80	48	128
	Total	2,849	63	2,912

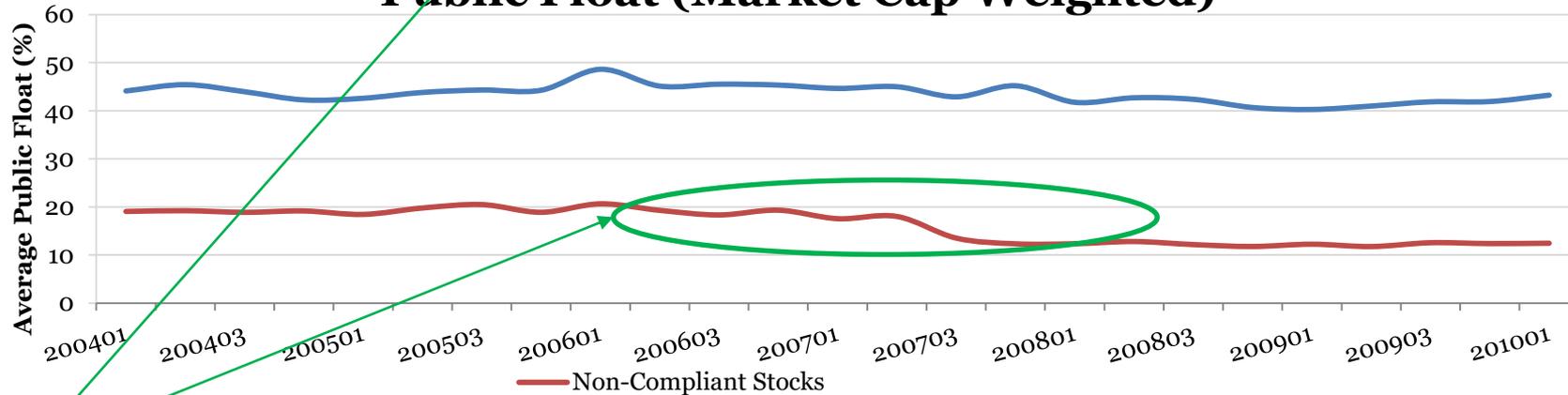
- **Very few firms affected by regulation!**
 - Only **~4.5%** (128) firms were non compliant
 - Their market cap: **~11%**
- **80** firms complied within three years
- **48** firms remained non-compliant

Lookback at universe of stocks (2004-2010)

Public Float (Equal Weighted)

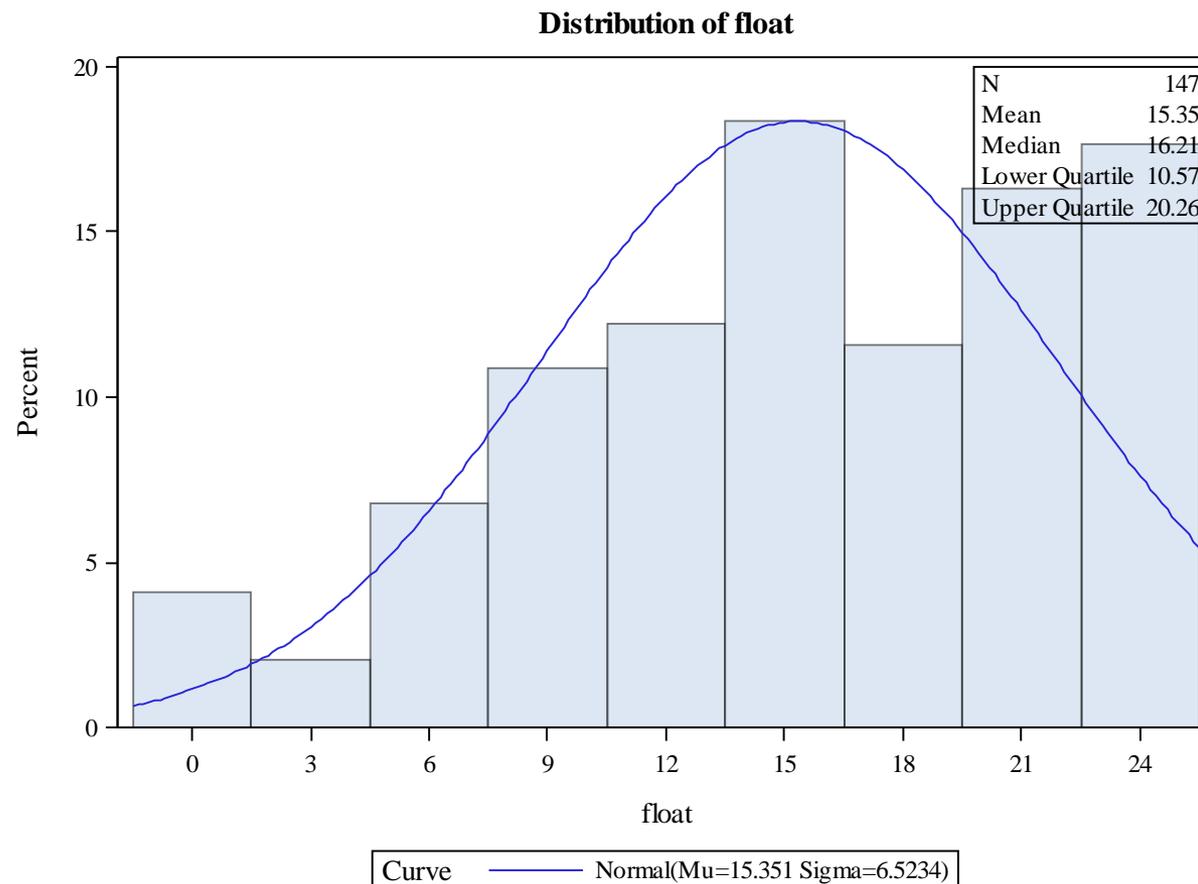


Public Float (Market Cap Weighted)



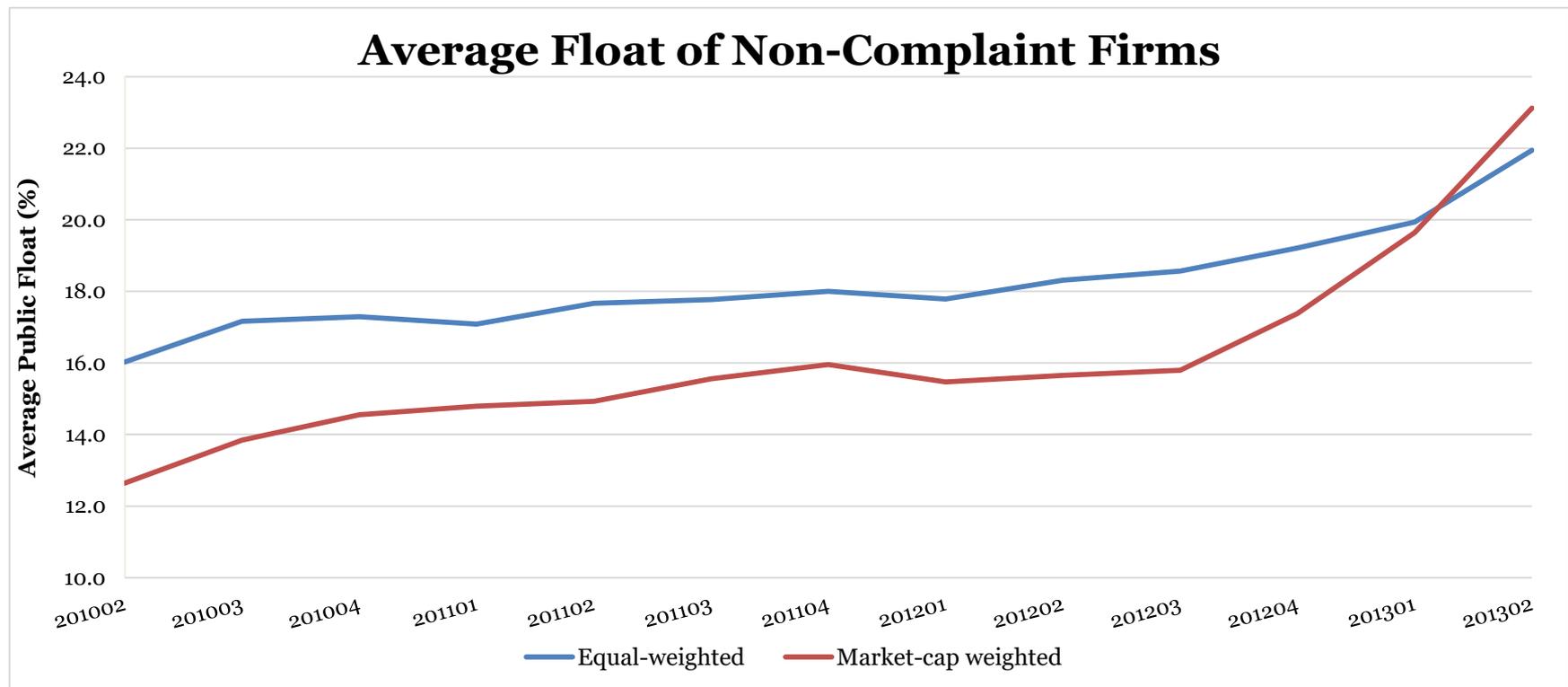
General trend of reduction in float starting 2007, more so for NC stocks

Typical Characteristics of Non Complaint Firms Q1 – 2010



- Large
- Highly Profitable
- Business Group/
Family owned

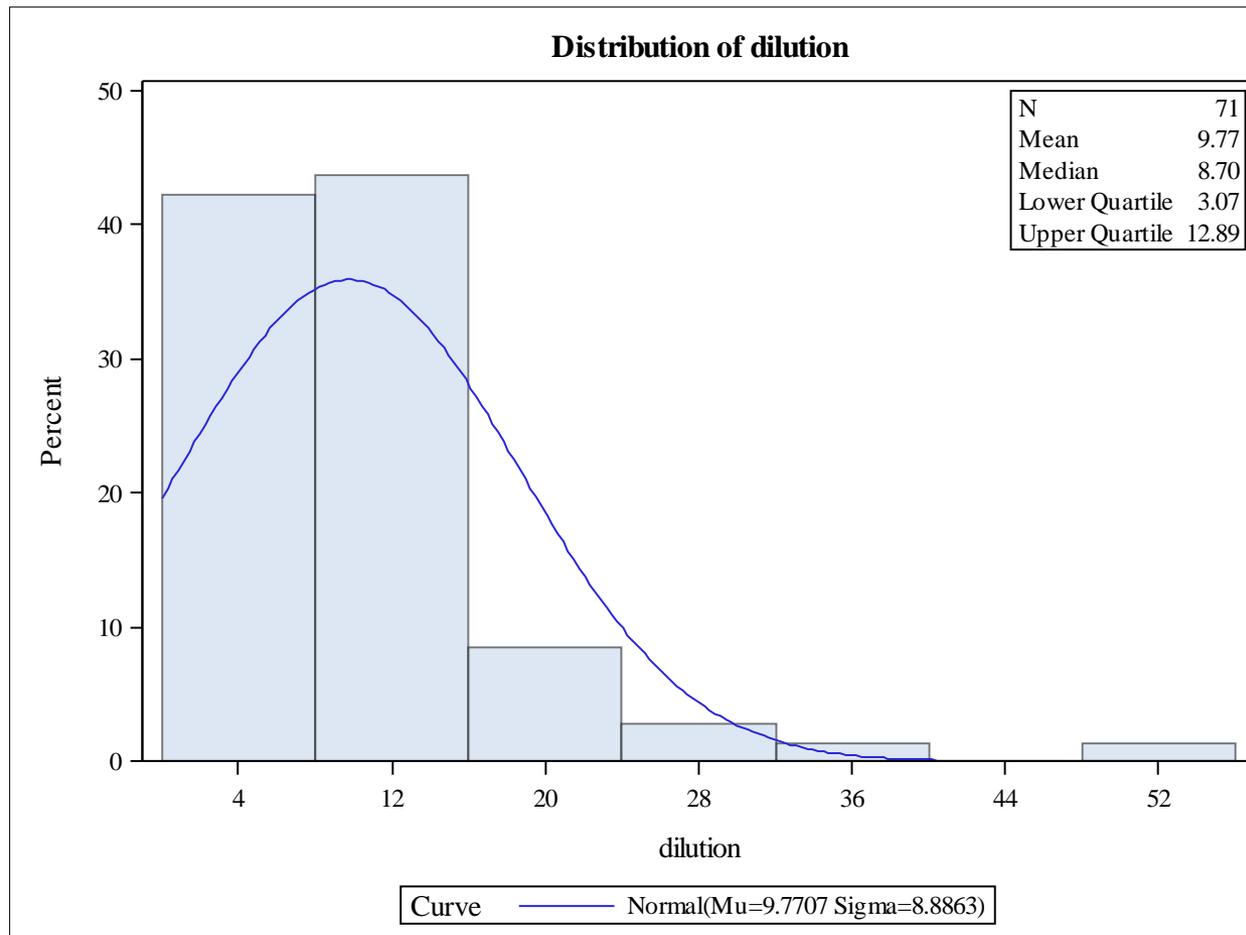
How did Non-Complaint Firms (as on 2010Q1) respond during the period 2010 – 2013



TWO CATEGORIES OF FRIMS THAT WERE NON COMPLAINT IN 2010Q1

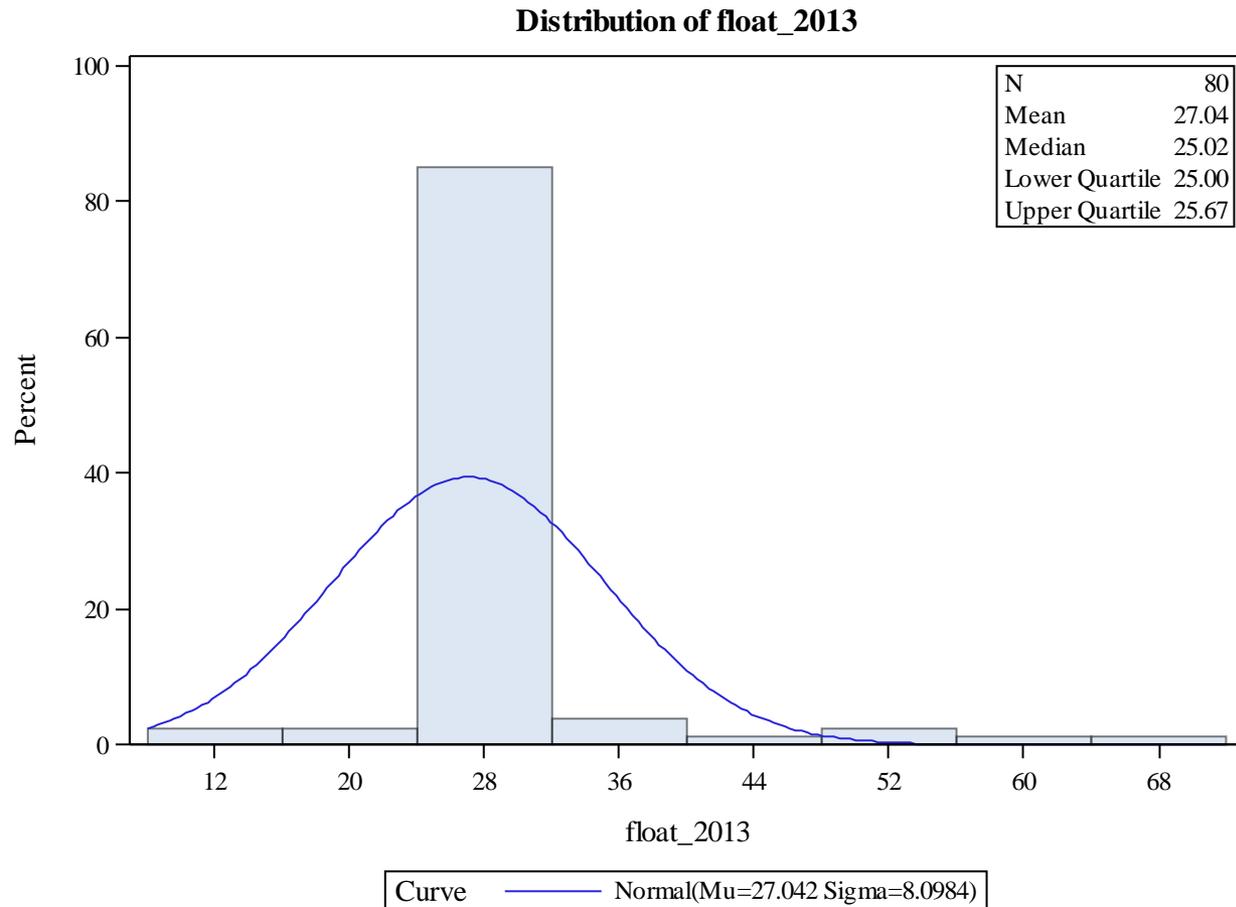
- CATEGORY I (NCC):
 - Firms there were noncompliant in 2010 Q1, but responded to the regulation and became compliant by the end of Jun 2013
- CATEGORY II (NCNC):
 - Firms there were noncompliant in 2010 Q1, but did NOT respond to the regulation and remained non compliant till end of Jun 2013

Dilution Distribution of NCC Firms during 2010-2013

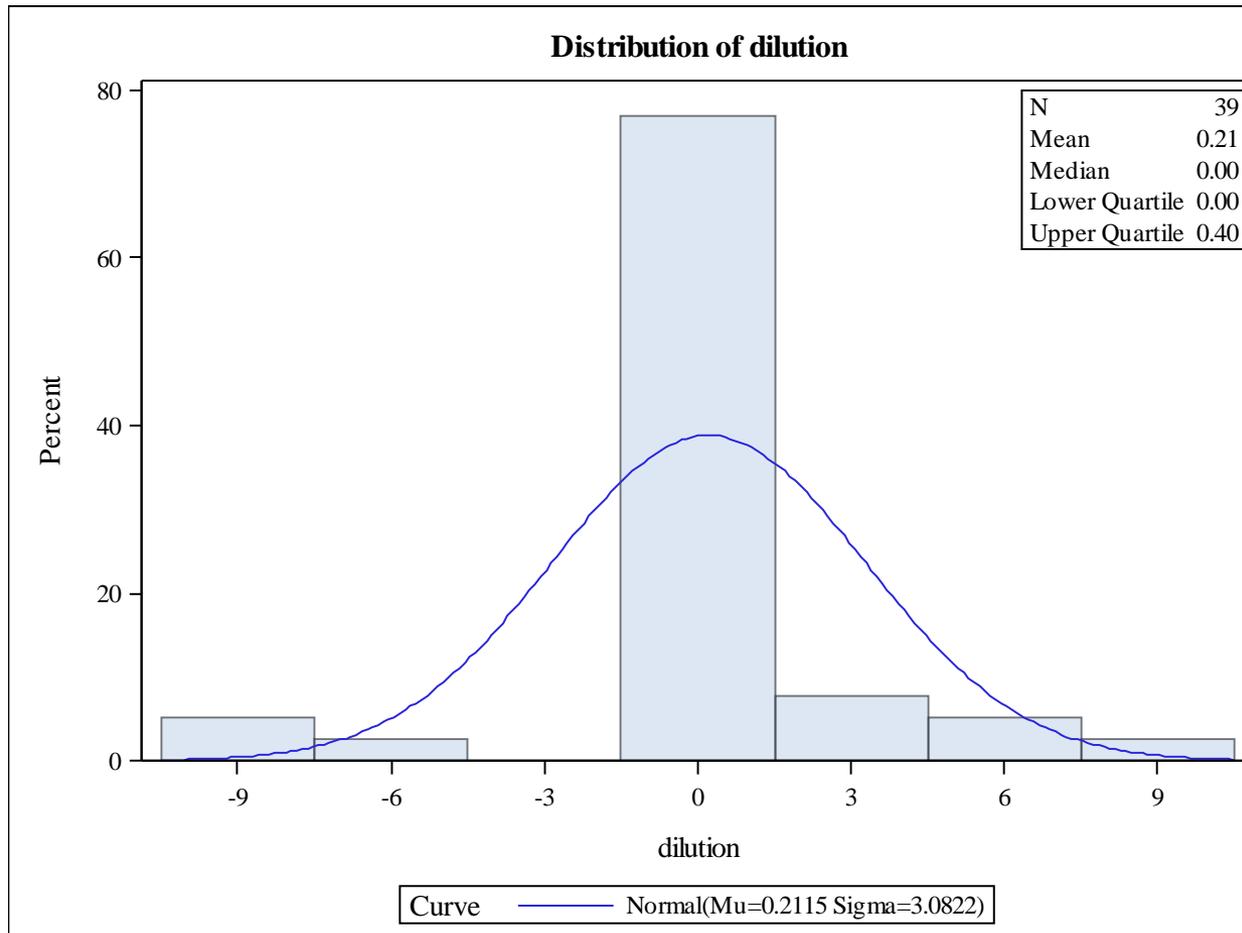


Marginal dilution; aimed at compliance at the minimum level

Float Distribution of NCC Firms (end Jun 2013)

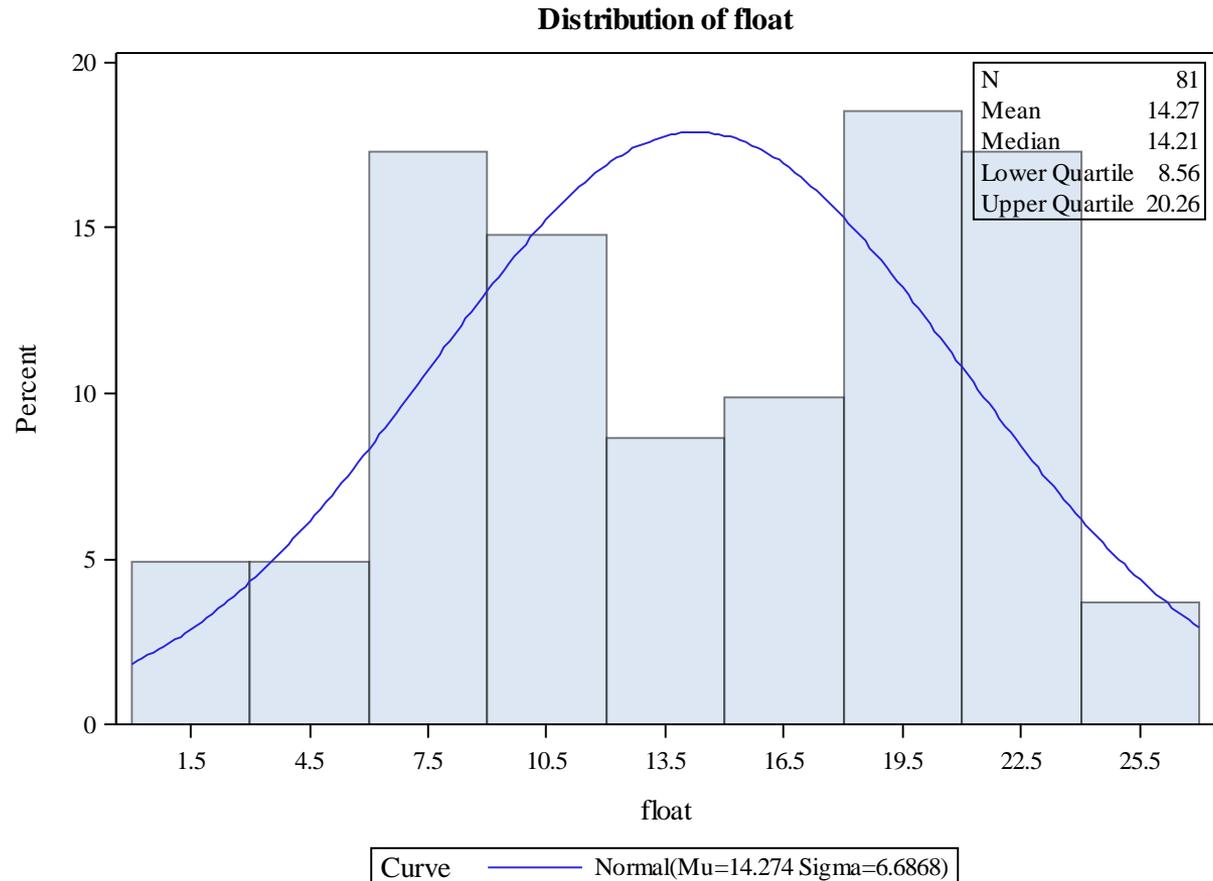


Dilution Distribution of NCNC Firms during 2010-2013



Typical Characteristics of Firms that Chose to Remain Non Complaint in Jun 2013

- Smaller firms
- Looking for:
 - Sell out
 - Exit
 - Takeover



Non Compliance: Possible Motives

- Dilution costs
- Delisting costs
- Control benefits
- Testing the waters
 - Historical laxity in enforcement of MPS rules

Key Questions

- Is there empirical evidence to justify such a policy?
 - Do liquidity and price discovery depend on float? (Ex-ante perspective) **YES!**
- Impact of the policy change
 - Magnitude of the issue: **SMALL (128 firms): MOST FIRMS WERE ALREADY COMPLIANT!**
 - Evidence from data: **80 FIRMS COMPLIED - JUST MET THE MINIMUM FLOAT LIMIT OF 25% - and 48 FIRMS IGNORED REGULATION**
- **Did the policy work for the firms that complied?**
 - **Ex-post analysis of changes in liquidity and price discovery measures.**
- Is there a need to revisit the policy?
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Methodology: Propensity Matching

Objective: To find matches for our sample firms using variables (other than float) that are known to impact liquidity

Approach: Use logistic regression to estimate propensity of a firm to be subject to the regulation (i.e., be non compliant as on Q1 2010) using the following independent variables:

- Log market capitalization
- Inverse of price
- Age
- Stock volatility
- Listing dummy (=1 if it is listed in both BSE and NSE)
- PSU dummy (=1 if it a government enterprise)
- Foreign dummy (=1 if promoter is a foreign entity)
- Business group dummy (=1 if promoter is part of a business group)

Methodology: Propensity Matching

Matching sample selection: Use a N:1 matching algorithm and 0.001 radius for distance between propensity scores to determine matching control firms for non-compliant sample firms (as on 2010Q1)

Final sample: Of the 80 firms (out of 128) that chose to comply with SEBI rule by 2013, 71 firms had well matched control firms.

Methodology: Difference in Difference (DID) Technique

- We use Difference-in-difference method to estimate the difference between:
 - Sample and control (sample dummy) and
 - Pre-SEBI rule and post-SEBI rule periods (period dummy)
 - Interaction between sample and period dummies

- The specification we use is:

$$\begin{aligned} \text{Liquidity Variable} = & \alpha + \beta_1 * \text{Sample Dummy} (= 1 \text{ if sample firm}) \\ & + \beta_2 * \text{Period Dummy} (= 1 \text{ if post - SEBI rule}) \\ & + \beta_3 * \text{Sample Dummy} * \text{Period Dummy} + \sum_i (\beta_i * \text{IndepVar}_i) \end{aligned}$$

- Independent variables: Log market cap, Inverse price, Age, Stock volatility, EBITDA (in %), Price to book (averaged over previous 4 quarters), Listing dummy, PSU dummy, Foreign dummy and Business group dummy
- All variables were winsorized at 1%
- Standard errors are clustered at the firm level

Results: Propensity Score Matching

Parameter	Relation
Market Cap	+ve
Inverse Price	Insignificant
Age	Insignificant
Volatility	+ve
Listed on both exchanges	-ve
Public sector	+ve
Foreign owned	+ve
Business Group	Insignificant

Large firms in high risk industries likely to be non-compliant

Results: Propensity Score Matching

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-4.9779	0.3866	161.7887	<.0001
Market Cap	1	0.3395	0.0524	41.9797	<.0001
Inverse Price	1	-1.9914	1.4105	1.9934	0.1580
Age (years)	1	-0.0143	0.0093	2.3428	0.1259
Listed on Both Exchanges	1	-1.1129	0.2462	20.4285	<.0001
Public Sector	1	0.9035	0.3689	5.9981	0.0143
Foreign Firms	1	1.4424	0.2532	32.4641	<.0001
Business Group	1	-0.0263	0.2377	0.0122	0.9120





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DID Results – Amihud Illiquidity (NCC*)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	35.4278700	7.3401880	4.83	0.000
Sample (treatment)	2.6400150	2.1224370	1.24	0.216
Postsebi (Trend)	5.9374450	2.2457100	2.64	0.009
Inter (Interaction)	0.7541385	2.7450530	0.27	0.784
Market Cap	-4.1935820	0.8649177	-4.85	0.000
Inverse Price	9.2537910	16.5930900	0.56	0.578
Age (years)	0.0554632	0.1175316	0.47	0.638
Qtrly Volatility	24.5506800	54.2109100	0.45	0.651
EBITDA (%)	0.0178605	0.0080771	2.21	0.029
Price-to-book	0.3889861	0.2276691	1.71	0.090
Listed on Both Exchanges	-1.1126900	2.4041080	-0.46	0.644
Public Sector	4.8973770	2.9231130	1.68	0.096
Foreign Firms	-4.1160060	2.8503190	-1.44	0.151
Business Group	0.2809217	2.3309540	0.12	0.904





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*Sample: Firms non-compliant in 2010Q1 but compliant in Jun 2013

DID Results – Turnover (NCC)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	-0.0017176	0.0008442	-2.03	0.044
Sample (treatment)	-0.0013361	0.0003600	-3.71	0.000
Postsebi (Trend)	-0.0006027	0.0003474	-1.73	0.085
Inter (Interaction)	0.0003446	0.0003777	0.91	0.363
Market Cap	0.0002556	0.0000870	2.94	0.004
Inverse Price	-0.0011210	0.0007469	-1.50	0.136
Age (years)	5.93e-06	0.0000214	0.28	0.782
Qtrly Volatility	0.0541135	0.0091430	5.92	0.000
EBITDA (%)	3.68e-07	8.93e-07	0.41	0.681
Price-to-book	-0.0000334	0.0000297	-1.12	0.263
Listed on Both Exchanges	0.0012913	0.0004018	3.21	0.002
Public Sector	-0.0010979	0.0004954	-2.22	0.028
Foreign Firms	-0.0008327	0.0003986	-2.09	0.039
Business Group	-0.0001046	0.0003355	-0.31	0.756





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DID Results – Trading Frequency (NCC)

Parameter	Coef .	Robust Std. Err.	t	P > t
Intercept	0.6569643	0.0598381	10.98	0.000
Sample (treatment)	-0.0227604	0.0230052	-0.99	0.324
Postsebi (Trend)	-0.0335362	0.0201444	-1.66	0.098
Inter (Interaction)	-0.0117162	0.0081310	-0.51	0.608
Market Cap	0.0316901	0.0073898	4.29	0.000
Inverse Price	0.1148262	0.1060733	1.08	0.281
Age (years)	-0.0020061	0.0012849	-1.56	0.121
Qtrly Volatility	1.2128970	0.4967081	2.44	0.016
EBITDA (%)	-0.0002001	0.0000590	-3.39	0.001
Price-to-book	-0.0062233	0.0032978	-1.89	0.061
Listed on Both Exchanges	0.0530847	0.0256577	2.07	0.040
Public Sector	-0.0257109	0.0225475	-1.14	0.256
Foreign Firms	0.0807213	0.0284016	2.84	0.005
Business Group	0.0290423	0.0197122	1.47	0.143





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DID Results – Roll's Covariance (NCC)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	-4.3824640	5.6955170	-0.77	0.444
Sample (treatment)	-0.9182115	1.5317960	-0.60	0.551
Postsebi (Trend)	-0.9497135	1.1312330	-0.84	0.404
Inter (Interaction)	0.3869024	0.8725782	0.44	0.659
Market Cap	0.2412864	0.3578634	0.67	0.502
Inverse Price	3.2602920	4.0052590	0.81	0.418
Age (years)	0.0553109	0.0691683	0.80	0.427
Qtrly Volatility	-8.8590290	22.1232100	-0.40	0.690
EBITDA (%)	0.2713370	0.0263763	1.03	0.307
Price-to-book	0.3824550	0.3748580	1.02	0.311
Listed on Both Exchanges	1.7279410	3.2288230	0.54	0.594
Public Sector	-0.7766598	1.2907030	-0.60	0.549
Foreign Firms	3.3257670	1.7556260	1.89	0.062
Business Group	0.7522503	1.2088350	0.62	0.536





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DID Results – GK Volatility (NCC)

Parameter	Coef.	Robust Std. Err.	t	P > t
Intercept	0.0038021	0.0492657	0.08	0.939
Sample (treatment)	-0.0247006	0.0170616	-1.45	0.150
Postsebi (Trend)	-0.0665701	0.0164815	-4.04	0.000
Inter (Interaction)	0.0078159	0.0194937	0.40	0.689
Market Cap	0.0112325	0.0059327	1.89	0.060
Inverse Price	0.1517367	0.1203137	1.26	0.209
Age (years)	-0.0008363	0.0008683	-0.96	0.337
Qtrly Volatility	9.9795170	0.4062190	24.57	0.000
EBITDA (%)	-0.0001433	0.0000490	-2.92	0.004
Price-to-book	-0.0022525	0.0016570	-1.36	0.176
Listed on Both Exchanges	0.0699629	0.0216746	3.23	0.002
Public Sector	-0.0491892	0.0194660	-2.53	0.013
Foreign Firms	0.0314080	0.0211128	1.49	0.139
Business Group	0.0105486	0.0162574	0.65	0.518





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DID Results – Variance Ratio (NCC)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	0.9367265	0.1748898	5.36	0.000
Sample (treatment)	0.0334618	0.0818524	0.41	0.683
Postsebi (Trend)	-0.0106792	0.0826983	-0.13	0.897
Inter (Interaction)	-0.1110912	0.1141269	-0.97	0.332
Market Cap	-0.0048622	0.0169325	-0.29	0.774
Inverse Price	0.9102260	0.3171563	2.87	0.005
Age (years)	0.0003606	0.0036476	0.10	0.921
Qtrly Volatility	1.5299290	1.3554640	1.13	0.261
EBITDA (%)	-0.0009320	0.0002709	-3.44	0.001
Price-to-book	0.0178807	0.0088198	2.03	0.045
Listed on Both Exchanges	0.0892802	0.0788788	1.13	0.260
Public Sector	0.0058707	0.0934968	0.06	0.950
Foreign Firms	-0.1606272	0.0619837	-2.59	0.011
Business Group	0.0807079	0.0605580	5.36	0.000





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DID Results – Did Compliance Really Improve Liquidity?

Measure	Impact (Change in measure)	Coeff.	P > t
Amihud Illiquidity	None	0.7541385	0.784
Daily Turnover	None	0.0003446	0.363
Trading Frequency	None	-0.0117162	0.608
Roll's measure	None	0.3869024	0.659
Garman Klass Vol	None	0.0078159	0.689
Variance Ratio	None	-0.1110912	0.332





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Key Takeaway: Policy may NOT have had the desired effect

DID Results – Amihud Illiquidity (Compliance vs. Non-Compliance)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	47.7216100	8.8244240	5.41	0.000
Compliant	2.5981690	2.5733610	1.01	0.315
postsebi	4.3861020	2.2564840	1.94	0.055
inter	2.6342870	3.1594400	0.83	0.406
Market Cap	-5.9904110	0.9842076	-6.09	0.000
Inverse Price	28.1040700	39.0894000	0.72	0.474
Age (years)	0.0959567	0.1228932	0.78	0.437
Qtrly Volatility	-16.2571100	47.0726200	-0.35	0.731
EBITDA (%)	0.0711030	0.0226822	3.13	0.002
Price to Book	0.0863802	0.1330428	0.65	0.518
Listed on Both Exchanges	1.4906910	2.4762400	0.60	0.548
Public Sector	3.8821680	2.4115530	1.61	0.110
Foreign Firms	-3.9274530	2.6118920	-1.50	0.136
Business Group	2.9894730	2.4942060	1.20	0.233





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DID Results – Turnover Ratio (Compliance vs. Non-Compliance)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	-0.0014546	0.0005628	-2.58	0.011
Complaint	0.0000699	0.0002158	0.32	0.747
postsebi	0.0003373	0.0002595	1.30	0.197
inter	-0.0003505	0.0003146	-1.11	0.268
Market Cap	0.0002075	0.0000520	3.99	0.000
Inverse Price	-0.0020508	0.0006848	-2.99	0.003
Age (years)	-0.0000254	9.47e-06	-2.69	0.008
Qtrly Volatility	0.0343748	0.0069939	4.91	0.000
EBITDA (%)	-8.06e-07	3.43e-06	-0.23	0.815
Price to Book	-0.0000196	0.0000103	-1.90	0.060
Listed on Both Exchanges	0.0007104	0.0002230	3.19	0.002
Public Sector	-0.0003533	0.0004775	-0.74	0.461
Foreign Firms	-0.0004479	0.0002367	-1.89	0.061
Business Group	-0.0002059	0.0002621	-0.79	0.434





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DID Results – Trading Frequency (Compliance vs. Non-Compliance)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	0.5457319	0.0862984	6.32	0.000
Compliant	-0.0226944	0.0297231	-0.76	0.447
postsebi	-0.0460742	0.0221931	-2.08	0.040
inter	-0.0103786	0.0267321	-0.39	0.699
Market Cap	0.0523295	0.0098976	5.29	0.000
Inverse Price	0.0361195	0.2550145	0.14	0.888
Age (years)	-0.0021126	0.0013964	-1.51	0.133
Qtrly Volatility	0.6237212	0.5352865	1.17	0.247
EBITDA (%)	-0.0007852	0.0002378	-3.30	0.001
Price to Book	-0.0017717	0.0017517	-1.01	0.314
Listed on Both Exchanges	0.0140450	0.0283501	0.50	0.621
Public Sector	-0.0133550	0.0253225	-0.53	0.599
Foreign Firms	0.0654547	0.0307876	2.13	0.036
Business Group	0.0075482	0.0219315	0.34	0.34





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DID Results – GK Volatility (Compliance vs. Non-Compliance)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	-0.1023927	0.0637959	-1.61	0.112
Compliant	-0.0134024	0.0204628	-0.65	0.514
postsebi	-0.0812535	0.0180868	-4.49	0.000
inter	0.0086504	0.0213922	0.40	0.687
Market Cap	0.0033574	0.0073157	4.59	0.000
Inverse Price	0.3303471	0.3108364	1.06	0.290
Age (years)	-0.0011619	0.0009133	-1.27	0.206
Qtrly Volatility	9.0237440	0.4606641	19.59	0.000
EBITDA (%)	-0.0005717	0.0001549	-3.69	0.000
Price to Book	-0.0014304	0.0012089	-1.18	0.239
Listed on Both Exchanges	0.0078089	0.0219553	0.36	0.723
Public Sector	-0.0394243	0.0188389	-2.09	0.039
Foreign Firms	0.0305121	0.0192550	1.58	0.116
Business Group	-0.0257749	0.0184372	-1.40	0.165





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Impact of Compliance – Variance Ratio (Compliance vs. Non-Compliance)

Parameter	Coef .	Robust Std. Err.	t	P> t
Intercept	0.6366627	0.2506140	2.54	0.013
Compliant	-0.1318866	0.1430599	-0.92	0.359
postsebi	-0.2951114	0.1475458	-2.00	0.048
inter	0.1453204	0.1590237	0.91	0.363
Market Cap	0.0723128	0.0333186	2.17	0.032
Inverse Price	0.7866327	0.6032429	1.30	0.195
Age (years)	-0.0022269	0.0047193	-0.47	0.638
Qtrly Volatility	3.8597800	2.0409070	1.89	0.061
EBITDA (%)	-0.0013332	0.0009073	-1.47	0.145
Price to Book	0.0039304	0.0054073	0.73	0.469
Listed on Both Exchanges	-0.1064194	0.1407190	-0.76	0.451
Public Sector	-0.0664165	0.1483692	-0.45	0.655
Foreign Firms	-0.1760012	0.0808368	-2.18	0.032
Business Group	0.0399035	0.1160605	0.34	0.732





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DID Results – Summary (Compliance vs. Non-Compliance)

Measure	Impact (Change in measure)	Coeff.	P > t
Amihud Illiquidity	None	2.634287	0.406
Daily Turnover	None	-0.0003505	0.268
Trading Frequency	None	-0.0103786	0.699
Garman Klass vol	None	0.0086504	0.687
Variance Ratio	None	0.1453204	0.363





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Key Takeaway: Policy may NOT have had the desired effect

DID results are a puzzle

- Inconsistent with our ex-ante evidence on the positive relation between liquidity and price discovery measures with float [**No direct benefit!**]
- Our findings are consistent with the finding that announcement period returns are not significantly positive (Jain, Tantri, Thirumalai) [**No valuation effects!**]

→ Policy benefits seem questionable!

Key Questions

- Is there empirical evidence to justify such a policy?
 - Do liquidity and price discovery depend on float? (Ex-ante perspective) **YES!**
- Impact of the policy change
 - Magnitude of the issue: **SMALL (128 firms): MOST FIRMS WERE ALREADY COMPLIANT!**
 - Evidence from data: **80 FIRMS COMPLIED - JUST MET THE MINIMUM FLOAT LIMIT OF 25% - and 48 FIRMS IGNORED REGULATION**
- Did the policy work for the firms that complied?
 - Ex-post analysis of changes in liquidity and price discovery measures.
POLICY DID NOT WORK (NO PERCEPTIBLE CHANGE IN LIQUIDITY/PRICE DISCOVERY FOR FIRMS THAT COMPLIED!
- **Is there a need to revisit the policy?**
- **How could the policy be revised?**

Control Benefits and Promoter Ownership

- Companies Act 2013 indicates that 75% holding is critical for promoters to enforce **special resolutions** (for simple majority, 51% is required)
- Dilution distribution also suggests that non-compliant firms may have been hesitant to increase float beyond 25%, **possibly due to potential loss of control benefits**

KEY CONTROL RIGHTS of PROMOTERS, Companies Act, 2013

>=51% ownership

- Appointing managerial personnel and remuneration
- Declaring dividends
- Appointing directors and remuneration
- Removing a director

>=75% ownership

- Altering articles of association, MoA
- Preferential issues
- Buybacks
- Voluntary winding up
- Issue of GDR/ADR
- Reappointment of independent director
- Removal of auditor
- Granting of inter corporate loans

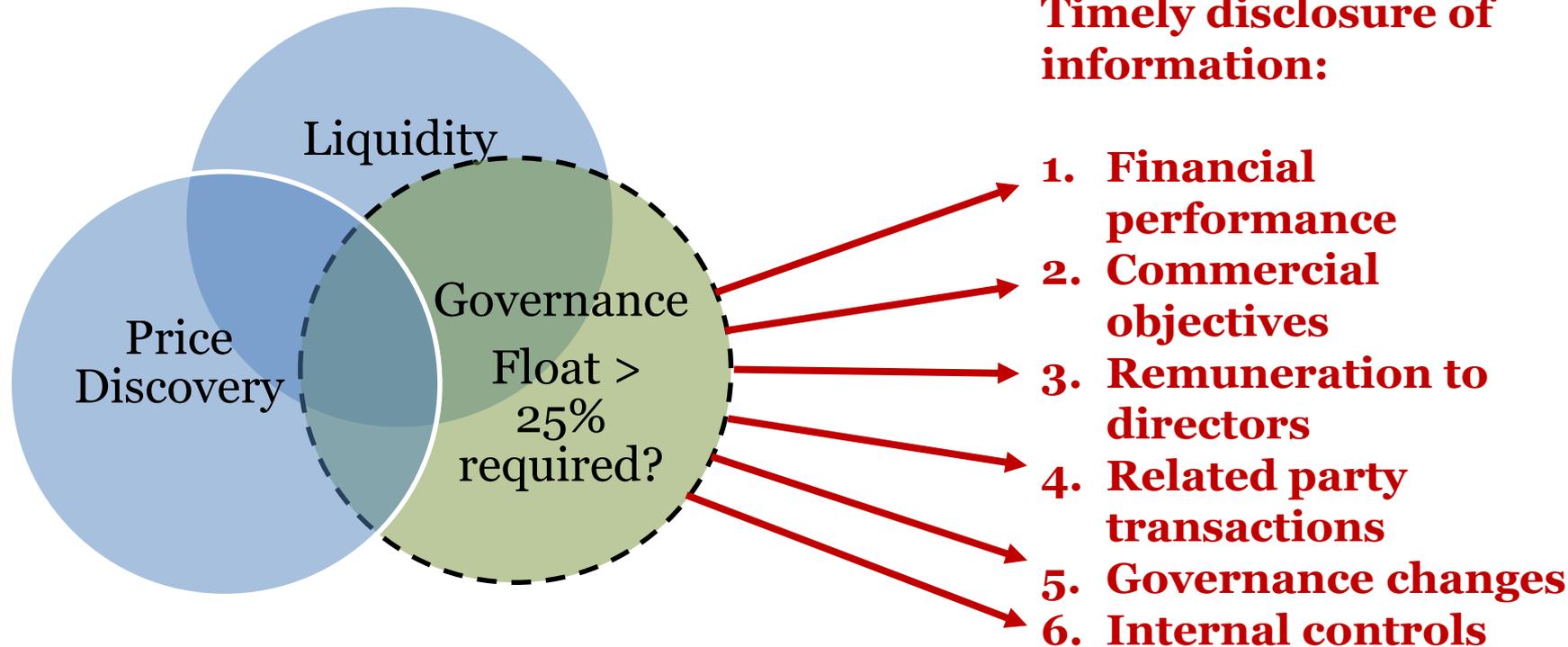
Special Resolution Requirements

In the Indian context, a float requirement greater than 25% will **require a greater degree of non-promoter approval** for special resolutions

→ better shareholder monitoring

→ greater transparency and lower information asymmetry will be a natural fallout

Corporate Governance and Float



Governance mitigates information asymmetry, which improves liquidity and price discovery

How Critical is the 25% Float Cutoff?

- We repeated the ex-ante analysis for firms with less than 25% float
 - We found that the relation between liquidity and price discovery with float disappears!
- Cutoff of 25% plays a very critical role

Ex-ante Analysis (2004-2010)

Restricted to Firms with $\leq 25\%$ Float

Measure	No restrictions on Float	Float $\leq 25\%$
Amihud Illiquidity	-ve	None
Daily Turnover	+ve	None
Trading Frequency	+ve	None
Roll's Measure	-ve	None
Garman Klass Volatility	+ve	None
Variance Ratio	+ve	None

Key Takeaway:

There is no relation between liquidity/price discovery measures and float for firms that maintain float below 25%

Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 25\%$ Float – Amihud Illiquidity

Parameters	Coef .	Robust Std. Err .	t	P > t	[95% Conf. Interval]	
Intercept	23.4194800	6.3429190	3.69	0.000	10.9448100	35.8941400
Float	-0.0738060	0.2055235	-0.36	0.720	-0.4780105	0.3303986
Market Cap	-3.6670830	0.6475358	-5.66	0.000	-4.9405960	-2.393570
Inverse Price	44.8969900	20.9875100	2.14	0.033	3.6207050	86.1732700
Age (years)	0.0883149	0.1192392	0.74	0.459	-0.1461937	0.3228235
EBITDA (%)	0.0381412	0.0165985	2.30	0.022	0.0054968	0.0707856
Price-to-book	0.0929982	0.1325715	0.70	0.483	-0.1677310	0.3537275
Listed on Both Exchanges	1.3146080	1.4690440	0.89	0.371	-1.5745700	4.2037870
Public Sector	1.9531790	1.8811330	1.04	0.300	-1.7464580	5.6528150
Foreign Firms	-4.9011950	1.6676740	-2.94	0.004	-8.1810200	-1.6213690
Business Group	-4.0391850	1.7612300	-2.29	0.022	-7.5030080	-0.5753616





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 25\%$ Float – Daily Turnover

Parameters	Coef .	Robust Std. Err .	t	P> t	[95% Conf. Interval]	
Intercept	-0.0019382	0.0005069	-3.82	0.000	-0.0029352	-0.0009412
Float	0.0000452	0.0000115	3.92	0.000	0.0000226	0.0000679
Market Cap	0.0002201	0.0000563	3.91	0.000	0.0001093	0.0003309
Inverse Price	-0.0014079	0.0007883	-1.79	0.075	-0.0029582	0.0001424
Age (years)	-0.0000264	939e-06	-2.82	0.005	-0.0000449	-7.97e-06
EBITDA (%)	-1.27e-06	1.51e-06	-0.84	0.400	-4.24e-06	1.69e-06
Price-to-book	-0.0000118	0.0000102	-1.16	0.248	-0.0000318	8.24e-06
Listed on Both Exchanges	0.0006977	0.0001573	4.44	0.000	0.0003884	0.0010070
Public Sector	-0.0005281	0.0003102	-1.70	0.090	-0.0011381	0.0000820
Foreign Firms	-0.0002585	0.0002078	-1.24	0.214	-0.0006672	0.0001501
Business Group	0.0000578	0.0001791	0.32	0.747	-0.0002945	0.0004101





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 25\%$ Float – Trading Frequency

Parameter	Coef .	Robust Std. Err .	t	P > t	[95% Conf. Interval]	
Intercept	0.6334859	0.0645213	9.82	0.000	0.5065913	0.7603805
Float	0.0030642	0.0019415	1.58	0.115	-0.0007542	0.0068826
Market Cap	0.0387557	0.0063675	6.09	0.000	0.0262326	0.0512787
Inverse Price	-0.0224720	0.1278408	-0.18	0.861	-0.2738265	0.2288825
Age (years)	-0.0012578	0.0011553	-1.09	0.277	-0.0035300	0.0010144
EBITDA (%)	-0.0002618	0.0001275	-2.05	0.041	-0.0005124	-0.0000111
Price-to-book	-0.0036586	0.0019412	-1.88	0.060	-0.0074764	0.0001592
Listed on Both Exchanges	0.0201439	0.0168644	1.19	0.233	-0.0130234	0.0533112
Public Sector	-0.0387622	0.0305270	-1.27	0.205	-0.0988013	0.0212768
Foreign Firms	0.0571495	0.0205767	2.78	0.006	0.0166812	0.9761770
Business Group	0.0329877	0.0197076	1.67	0.095	-0.0057714	0.0717468





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 25\%$ Float – Roll's Covariance

Parameter	Coef .	Robust Std. Err .	t	P> t	[95% Conf. Interval]	
Intercept	9.2646290	3.2373370	2.86	0.006	2.8095620	15.7197000
Float	0.0087541	0.0466912	0.19	0.852	-0.0843456	0.1018538
Market Cap	-0.8855239	0.2478597	-3.57	0.001	-1.3797420	-0.3913056
Inverse Price	-136.2480000	42.7451600	-3.19	0.002	-221.4795000	-51.0166000
Age (years)	0.0733981	0.0373809	1.96	0.054	-0.0011372	0.1479334
EBITDA (%)	0.0125737	0.0064070	1.96	0.054	-0.0002015	0.0253490
Price-to-book	0.1233555	0.6533800	1.89	0.063	0.0006924	0.2536358
Listed on Both Exchanges	1.6327110	0.8641535	1.89	0.063	-0.0903627	3.3557840
Public Sector	0.2821104	0.4859845	0.58	0.563	-0.6869151	1.2511360
Foreign Firms	1.3022390	0.8440423	1.54	0.127	-0.3807337	2.9852110
Business Group	0.7827549	0.8047665	0.97	0.334	-0.8219039	2.3874140





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We observe huge drop in observations in this regression

Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 25\%$ Float – GK Volatility

Parameter	Coef.	Robust Std. Err.	t	P > t	[95% Conf. Interval]	
Intercept	0.0520338	0.0407131	1.28	0.202	-0.0280369	0.1321045
Float	0.0026674	0.0013620	1.96	0.051	-0.0000112	0.0053461
Market Cap	0.0180960	0.0044833	4.04	0.000	0.0092787	0.0269133
Inverse Price	0.0289903	0.1115985	0.26	0.795	-0.1904912	0.2484719
Age (years)	-0.0020652	0.0008783	-2.35	0.019	0.0037925	-0.0003379
EBITDA (%)	-0.0001601	0.0000968	-1.65	0.099	0.0003505	0.0000304
Price-to-book	-0.0020468	0.0012450	-1.64	0.101	-0.0044954	0.0004019
Listed on Both Exchanges	0.0027563	0.1451550	0.19	0.850	-0.2579140	0.0313040
Public Sector	-0.3626900	0.0153467	-1.45	0.147	-0.8531050	0.0127725
Foreign Firms	0.0325507	0.0153467	2.12	0.035	0.0023683	0.0627331
Business Group	0.0116164	0.0148080	0.78	0.433	-0.0175065	0.0407394





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 25\%$ Float – Variance Ratio

Parameter	Coef .	Robust Std. Err .	t	P > t	[95% Conf. Interval]	
Intercept	0.4832558	0.2806538	1.72	0.087	-0.0704181	1.0369300
Float	-0.0057718	0.0081430	-0.71	0.479	-0.2183630	0.0102927
Market Cap	0.0708532	0.0339536	2.09	0.038	0.0038696	0.1378368
Inverse Price	1.1769170	0.4468462	2.63	0.009	0.2953785	2.0584550
Age (years)	-0.0064452	0.0054782	-1.18	0.241	-0.1725260	0.0043622
EBITDA (%)	-0.0003357	0.0004286	-0.78	0.435	-0.0011813	0.0005099
Price-to-book	0.0193965	0.0070447	2.75	0.006	0.0054988	0.0332942
Listed on Both Exchanges	-0.1637992	0.1174682	-1.39	0.165	-0.3955405	0.0679420
Public Sector	-0.1755774	0.1589801	-1.10	0.271	-0.4892135	0.1380586
Foreign Firms	-0.1444160	0.1028632	-1.40	0.162	-0.3473447	0.5851260
Business Group	0.0407084	0.1244690	0.33	0.744	-0.2048439	0.2862608





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Ex-ante Analysis (2004-2010) – Summary

Restricted to Firms with $\leq 50\%$ Float

Measure	Restrictions on Float (None)	Float $\leq 25\%$	Float $< 50\%$
Amihud Illiquidity	-ve	None	-ve
Daily Turnover	+ve	None	+ve
Trading Frequency	+ve	None	+ve
Roll's Measure	-ve	None	-ve
Garman Klass Vol	+ve	None	+ve
Variance Ratio	+ve	None	None

Key Takeaway:

The relation between liquidity/price discovery measures and float kicks in when float crosses a critical threshold between 25% and 50%

Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 50\%$ Float – Amihud Illiquidity

Parameter	Coef .	Robust Std. Err .	t	P > t	[95% Conf. Interval]	
Intercept	25.1561800	2.8001440	8.98	0.000	19.6648300	30.6475300
Float	-0.1186223	0.0342590	-3.46	0.001	-0.1858075	-0.0514371
Market Cap	-3.6921670	0.2791250	-13.23	0.000	-4.2395570	-3.1447760
Inverse Price	27.9689500	8.5607940	3.27	0.001	11.1804100	44.7574900
Age (years)	0.0705550	0.0437120	1.61	0.107	-0.0151684	0.15627850
EBITDA (%)	0.0147159	0.0068965	2.13	0.033	0.0011912	0.0282407
Price-to-book	0.3440704	0.0740576	4.65	0.000	0.1988364	0.4893044
Listed on Both Exchanges	-1.5099470	0.6111127	-2.47	0.14	-2.7083980	-0.3114968
Public Sector	6.1325420	1.286871	4.77	0.000	3.6088650	8.6562190
Foreign Firms	-1.0294000	0.9172955	-1.12	0.262	-2.8283050	0.7695045
Business Group	-2.6162700	0.7370269	-3.55	0.000	-4.0616500	-1.1708890





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 50\%$ Float – Turnover Ratio

Parameter	Coef .	Robust Std. Err .	t	P > t	[95% Conf. Interval]	
Intercept	-0.0025974	0.0005062	-5.13	0.000	-0.0035901	-0.0016047
Float	0.0000608	4.49E-06	13.54	0.000	0.0005200	0.0000696
Market Cap	0.0004108	0.0000476	8.64	0.000	0.0003175	0.0005041
Inverse Price	-0.0021862	0.0003601	-6.07	0.000	-0.0028924	-0.0014799
Age (years)	-0.0000609	7.62E-06	-7.99	0.000	-0.0000758	-0.0000459
EBITDA (%)	5.58E-08	5.95E-07	0.09	0.925	-1.11E-06	1.22E-06
Price-to-book	-0.0000140	0.0000133	-1.05	0.294	-0.0000400	0.0000121
Listed on Both Exchanges	0.0010522	0.0001179	8.92	0.000	0.0008210	0.0012835
Public Sector	-0.0013080	0.0002938	-4.45	0.000	-0.0018842	-0.0007318
Foreign Firms	-0.0005987	0.0001512	-3.96	0.000	-0.0008953	-0.0003022
Business Group	-0.0002166	0.0001326	-1.63	0.102	-0.0004767	0.0000434





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 50\%$ Float – Trading Frequency

Parameter	Coef.	Robust Std. Err.	t	P > t	[95% Conf. Interval]	
Intercept	0.6417668	0.0234009	27.42	0.000	0.5958753	0.6876583
Float	0.0018725	0.0003016	6.21	0.000	0.0012811	0.0024639
Market Cap	0.0362768	0.0023486	15.45	0.000	0.0316709	0.0408826
Inverse Price	-0.0223670	0.0363174	-0.62	0.538	-0.0935889	0.0488549
Age (years)	-0.0013375	0.0003934	-3.40	0.001	-0.0021090	-0.0005660
EBITDA (%)	-0.0001120	0.0000408	-2.74	0.006	-0.0001912	-0.0000320
Price-to-book	-0.0042541	0.0007341	-5.80	0.000	-0.0056936	-0.0028145
Listed on Both Exchanges	0.0293150	0.0056920	5.15	0.000	0.1815250	0.0404775
Public Sector	-0.0544446	0.0131465	-4.14	0.000	-0.0802261	-0.0286630
Foreign Firms	0.0314239	0.0084487	3.72	0.000	0.1485510	0.04799270
Business Group	0.0248129	0.0061605	4.03	0.000	0.0127316	0.0368942





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 50\%$ Float – Roll's Covariance

Parameter	Coef .	Robust Std. Err .	t	P > t	[95% Conf. Interval]	
Intercept	3.4619180	0.7822341	4.43	0.000	1.9260090	4.9978270
Float	-0.0209019	0.0076365	-2.74	0.006	-0.0358960	-0.0059078
Market Cap	-0.2026015	0.0446951	-4.53	0.000	-2.9305980	-0.1148432
Inverse Price	-9.5587990	2.2674240	-4.22	0.000	14.0108600	-5.1067350
Age (years)	0.0353068	0.0087922	4.02	0.000	0.0180435	0.0525702
EBITDA (%)	0.0025715	0.0011250	2.28	0.023	0.0003605	0.0047824
Price-to-book	0.0751166	0.3102060	2.42	0.016	0.0142080	0.1360252
Listed on Both Exchanges	-0.0133100	0.4941037	-0.03	0.979	-0.9834776	0.9568577
Public Sector	-0.2918979	0.1916146	-1.52	0.128	-0.6681312	0.0843354
Foreign Firms	0.6721074	0.3373460	1.99	0.047	0.0097319	1.3344830
Business Group	0.2366225	0.16257920	1.46	0.146	-0.0826002	0.5558452





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 50\%$ Float – GK Volatility

Parameter	Coef .	Robust Std. Err .	t	P > t	[95% Conf. Interval]	
Intercept	-0.0100288	0.0168245	-0.60	0.551	-0.0430233	0.0229656
Float	0.0014338	0.0002360	6.07	0.000	0.0009709	0.0018966
Market Cap	0.0221611	0.0018538	11.59	0.000	0.0185256	0.0257966
Inverse Price	0.0560527	0.0353272	1.59	0.113	-0.0132274	0.1253328
Age (years)	-0.0018375	0.0003098	-5.93	0.000	-0.0024451	-0.0012300
EBITDA (%)	-0.0000520	0.0000376	-1.38	0.166	-0.0001256	0.0000217
Price-to-book	-0.0038917	0.0005586	-6.97	0.000	-0.0049872	-0.0027961
Listed on Both Exchanges	0.0118607	0.0060554	1.96	0.050	-0.0000144	0.2373590
Public Sector	-0.0652282	0.0126568	-5.15	0.000	-0.0900493	-0.0404071
Foreign Firms	0.0099795	0.0070908	1.41	0.159	-0.0039263	0.0238853
Business Group	0.0209074	0.0055462	3.77	0.000	0.0100308	0.0317840





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Ex-ante Analysis (2004-2010) Restricted to Firms with $\leq 50\%$ Float – Variance Ratio

Parameter	Coef.	Robust Std. Err.	t	P > t	[95% Conf. Interval]	
Intercept	0.4376531	0.0922490	4.74	0.000	0.2566976	0.6186085
Float	0.0023033	0.0013827	1.67	0.096	-0.0004090	0.0050156
Market Cap	0.0632503	0.0101965	6.20	0.000	0.0432488	0.0832517
Inverse Price	0.7115040	0.1868616	3.81	0.000	0.3449567	1.0780510
Age (years)	-0.0023002	0.0019137	-1.20	0.230	-0.0060541	0.0014536
EBITDA (%)	-0.0003759	0.0001931	-1.95	0.052	-0.0007546	2.89e-06
Price-to-book	0.0158520	0.0040045	3.96	0.000	0.0079968	0.0237072
Listed on Both Exchanges	-0.1444461	0.0349463	-4.13	0.000	-0.2129966	-0.0758956
Public Sector	-0.1457741	0.0577199	-2.53	0.012	-0.2589973	-0.0325509
Foreign Firms	-0.1741039	0.0376688	-4.62	0.000	-0.2479948	-0.1002129
Business Group	0.0368697	0.3450260	1.07	0.285	-0.0308106	0.1045499





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Summary

- MPS Rule is well motivated
- However, it has NOT had a significant impact on liquidity and price discovery measures
- Likely that it is a partial success; full impact of MPS rule (redistribution of wealth, liquidity, price discovery) is critically dependent on the float cutoff used.
- Maybe float cutoff can be increased:

Caveat: More analysis is required to assess

- Adverse impacts on promoter incentives, especially given new financing alternatives**
- Impact of quality of float (retail vs. block-holders)**

Additional Policy Issues

- IPOs
 - Most of the IPOs post 2010 have been compliant at the time of issue, although there is a 3-year window to reach 25%; is this a strategic decision?
- M&A
 - Strategic sale to bidder invokes rule that requires bidder to offer the same terms to an **additional 20% shares in the open market**; bidders strategically internalize these costs, thereby hurting disinvestment possibilities. Should this rule be revised, given the MPS rule?