

# **Liquidity in the Large: Evidence From an Exogenous Supply Shock**

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# Motivation

- Liquidity in the small: Transitory price effects primarily due to order book depth.
  - Keim and Madhavan, 1996
- Liquidity in the Large: Price effects due to a permanent shift in the supply curve.
  - Scholes, 1972
    - Price impact of seasoned equity offerings is largely driven by information about the issuer.
    - Confounding effects due to information and endogeneity issues.

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    - Price impact of seasoned equity offerings is largely driven by information about the issuer.
    - Confounding effects due to information and endogeneity issues.
- Classical finance assumes that assets have perfect substitutes and hence the demand curve is perfectly flat.
- However, because of frictions in the market (e.g. limits to arbitrage), even with perfect substitutes, the demand curve for stocks is likely to be downward sloping.

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- Research shows that prices react to changes in supply and demand.
  - Changes in supply (negative reaction): Scholes (1972), Mikkelson and Partch (1985)
    - But unable to separate the existence of a downward sloping demand curve from unfavorable information about the issuer released during secondary offerings.
  - Changes in demand (positive reaction): Shleifer (1986)
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    - But addition to index could signal positive information about the long-term prospects of the firms.
- Large literature on the reasons for positive price reaction when stocks are included in an index:
  - Downward sloping demand curve: Kaul et al. (2000) use an exogenous demand shock caused by a pre-announced weight adjustment to the TSE 300 index.
  - Price pressure: Harris and Gurel (1986), Biktimirov et al. (2004)
  - Positive information: Dhillon and Johnson (1991), Jain (1987)
  - Mixed: Lynch and Mendenhall (1997), Beneish and Whaley (1996)

# Our Study



- We use an exogenous supply shock to study the price impact of a large sale of shares.
- On June 4, 2010, SEBI mandated that PSUs must have a non-promoter shareholding of at least 10% and non-PSUs a non-promoter shareholding of at least 25% within three years.
- If the demand curve for stocks is downward sloping, we expect to see a negative reaction around the supply shock.
- PSUs are highly regulated and constrained firms, which means that we expect to see a larger negative price reaction around the supply shock for PSUs.

# Preview of Results



- Price reaction on the day of actual issue of shares is -2.42% and -5.44% over the 11-day window, with -4.45% between day 0 and day +2.
- No significant excess returns around SEBI notification date.
- We rule out price pressure as explanation for the negative price reaction as turnover returns to normal levels within 7 days but CAR does reverse even after 20 days.
- We also find that PSUs have a greater negative reaction on the issuance date, which is consistent with them having a steeper demand curve.

# Agenda

- The Event
- Data and Summary Statistics
- Methodology and Results
- Conclusions



# Minimum Public Shareholding (MPS)

SEBI notified on June 4, 2010 that all listed PSUs must maintain at least 10% public shareholding and all non-PSUs at least 25% public shareholding. PSUs were given until August 31, 2013 and non-PSUs until June 4, 2013 to comply.

Methods through which promoters could dilute stake:

- Issue of shares to the public through a prospectus (akin to SEO)
- OFS
- IPP
- Secondary Market
- Rights Issue
- Bonus Issue

- Hand-collect event data from the National Stock Exchange of India (NSE) and Bombay Stock Exchange websites: date of issue, percentage of promoter stake being diluted, floor price, if any, and number of times the issue is subscribed, if available.
- Also, get the same data from the Prime database.
- If there is any discrepancy, we use data from the company links and company news sections of [www.moneycontrol.com](http://www.moneycontrol.com) to resolve this.
- We also hand-collect data on the announcement date of the issue by the company from [www.moneycontrol.com](http://www.moneycontrol.com).
- Stock returns, dividend history, proportion of promoter shareholding, number of other directorships held by each promoter and director are from the CMIE Prowess database.

# Indian market overview



	PSUs	Non-PSUs
No of listed firms	80	4809
No of firms affected by SEBI regulation	15	261
Percentage of firms affected	18.75%	5.43%
No of compliant firms	14	180
Percentage of compliant firms	93.33%	68.97%
Total market capitalization (billlion Rs)	17,462.08	44,190.12
Floating market capitalization (billlion Rs)	3,856.92	23,056.14
Floating market capitalization Excluding LIC (billlion Rs)	3,119.75	20,729.27
Expected Supply Shock (billlion Rs)	214.93	234.76
Expected Supply Shock/Floating market capitalization	5.57%	1.02%
Expected Supply Shock/Floating market capitalization Excluding LIC	6.89%	1.13%
Expected Supply Shock/Floating market capitalization of affected firms	136.89%	21.32%

# Sample Selection



	PSUs		Non-PSUs	
	Firms	Events	Firms	Events
Total Firms	15		261	
(I) Compliant Firms	14		180	
(a) OFS	7	8	84	98
		Price Priority	6	7
		Single Clearing Price	0	0
(b) IPP	1	1	10	10
(c) Bonus/Rights			14	14
(d) Secondary Markets - Single Day			3	3
(e) Secondary Markets - Multiple days (1 week-3 months)			9	
(f) IPP + OFS			3	3
(g) Bonus + OFS			2	5
(h) OFS - Multiple Days			1	
(j) Employees Stock Purchase Scheme/OFS to employees			2	
(k) Firm got delisted in response to MPS requirement			2	
(l) Reclassification from promoters to Non-promoters			1	
(m) Converting interest free loan into related party transaction			1	
(n) Firm got delisted because of some other reasons			10	
(o) Firm got Acquired/Merged			2	
(p) Compliant Firm - No information available about event			40	
(q) Compliant Firm - Dilution was done for funding requirements			2	
(II) Non-compliant Firms even after OFS			5	
(III) Other Non-compliant Firms	1		76	

# Summary Statistics



Variable	Compliant Firms				Non-compliant Firms			
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.
Sales (million Rs.)	112	21,041.19	4,150.50	73,371.49	54	2,142.80	529.95	4,218.53
Assets (million Rs.)	128	36,406.38	4,986.55	78,906.95	67	2,706.22	408.20	8,516.19
EBITDA (million Rs.)	127	3,688.64	620.00	8,658.21	67	286.29	18.20	962.77
Price-to-book	123	0.98	1.99	17.85	53	-4.45	0.50	49.51
Shares Outstanding (millions)	127	278.90	29.50	565.25	58	32.53	5.00	100.98
Market Capitalization (million Rs.)	123	54,668.42	3,682.95	160,066.00	53	2,041.40	162.77	5,586.80

Variable	T-test p-value	W-test p-value
Sales	0.008	0.000
Assets	0.000	0.000
EBITDA	0.000	0.000
Price-to-book	0.409	0.000
Shares Outstanding	0.001	0.000
Market Capitalization	0.002	0.000

# Methodology

- Standard market model event study methodology.
- Day 0: Event (issue of shares).
- Estimation window:  $[-170, -21]$  with at least 120 days of non-missing data.
- Exclude days -20 through -6.
- Event windows starts from day -5.
- Market index: CNX Nifty index.
- Use Boehmer et al. (1991) methodology to calculate t-statistics for abnormal returns (AR) and cumulative abnormal returns (CAR).
- Use Kolar and Pynnonen (2010) methodology to adjust t-statistics to take into account cross-correlation due to event-date clustering.

# Price reaction around issuance



Event Time	Events	Non-PSUs				PSUs				
		Mean CAR	Median CAR	Mean AR	Median AR	Events	Mean CAR	Median CAR	Mean AR	Median AR
-5	66	-0.19%	-0.07%	-0.19%	-0.07%	7	-1.00%	-1.42%	-1.00%	-1.42%
-4	66	0.00%	-0.09%	0.19%	0.22%	7	-0.67%	-0.32%	0.33%	0.08%
-3	66	0.07%	-0.33%	0.10%	-0.27%	7	-1.02%	-0.13%	-0.35%	-0.50%
-2	65	0.36%	0.02%	0.32%	0.33%	7	-2.43%	-4.39%	-1.41%	-0.99%
-1	67	-0.53%	-1.40%	-0.94%	<b>-1.04%</b>	7	<b>-2.33%</b>	<b>-0.49%</b>	0.09%	0.61%
0	66	<b>-2.60%</b>	<b>-2.41%</b>	<b>-1.88%</b>	<b>-1.55%</b>	8	<b>-6.24%</b>	<b>-6.68%</b>	-4.19%	-2.71%
1	66	<b>-3.38%</b>	<b>-3.33%</b>	-1.03%	<b>-1.12%</b>	7	<b>-12.30%</b>	<b>-8.93%</b>	-5.72%	<b>-3.58%</b>
2	66	<b>-3.90%</b>	<b>-2.78%</b>	-0.52%	-0.14%	7	-14.60%	-10.41%	-2.38%	-2.96%
3	63	<b>-4.36%</b>	<b>-2.64%</b>	-0.38%	0.01%	8	-11.50%	-10.11%	1.83%	-0.72%
4	65	<b>-4.71%</b>	<b>-3.54%</b>	-0.38%	-0.03%	8	-11.30%	-13.57%	0.16%	-1.56%
5	67	<b>-4.89%</b>	<b>-3.35%</b>	-0.25%	-0.03%	8	-11.00%	-16.64%	0.37%	-0.23%

# Price pressure hypothesis



- Revision in prices:
  - $CAR_{1-T,j} = \alpha + \beta AR_{0,j} + \varepsilon_{1-T,j}$
  - Prices revert to their pre-OFS level around 75 days after the OFS.



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  - $CAR_{1-T,j} = \alpha + \beta AR_{0,i} + \varepsilon_{1-T,j}$
  - Prices revert to their pre-OFS level around 75 days after the OFS.
- Excess Turnover:
  - We examine daily turnover (natural logarithm of daily volume divided by shares outstanding) around share issuance.
  - Excess turnover on each event day is the difference between the turnover for that day and the normal turnover.
  - After day +7, excess turnover is insignificant.

# Determinants of CAR



First-stage selection model			
Compliance			
Log(Total Assets)	0.450*** [6.210]	0.440*** [6.251]	0.510*** [6.238]
Intercept	-3.509*** [-5.965]	-3.443*** [-6.006]	-4.073*** [-6.049]
Second-stage selection model			
	AR	CAR(0, +1)	CAR(0, +2)
Price-to-book	-0.004*** [-3.237]	-0.005*** [-2.573]	-0.014*** [-2.779]
RMSE	-0.008 [-0.653]	-0.025 [-1.325]	-0.058** [-2.307]
Dilution Fraction	-0.146 [-1.134]	0.138 [0.617]	0.440 [1.512]
PSU Dummy	-0.002 [-0.064]	-0.011 [-0.230]	-0.019 [-0.283]
F&O Dummy	0.053* [1.857]	0.119** [2.394]	0.143** [2.122]
Inverse Mills Ratio	0.024 [0.906]	0.062 [1.588]	0.113** [2.208]
Intercept	0.048 [1.054]	0.107 [1.400]	0.121 [1.283]
Industry Fixed Effects	YES	YES	YES
Observations	127	126	124

z-statistics are in parentheses below each estimate.  
 \* p < 0.10 \*\* p < 0.05 \*\*\* p < 0.01.

# Robustness Tests



- Price reaction around SEBI's announcement date.
- Price reaction on companies' announcement .
  - Intention to conduct the sale
  - Actual sale

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- Price reaction around SEBI's announcement date.
- Price reaction on companies' announcement .
  - Intention to conduct the sale
  - Actual sale
- Other types of events.
  - Bonus
  - IPP
- Confounding news events around the OFS date.
- Include only those firms in which promoters' stake was 75% after the OFS.

# Conclusions



- Examined price impact created by large scale of shares using a policy experiment.
- Price decrease is consistent with a downward sloping demand curve for stocks.
- We rule out a number of alternate information-related explanation as well as temporary price pressure effects.

# THANK YOU

# Penalties for non-compliance



- Promoters' benefits from dividend, rights, bonus, stock splits, and voting rights from the excess holding is frozen.
- Promoters and directors are not allowed to trade in the company's stock as well as other dealings in stocks (e.g. share pledges).
- Promoters and directors of non-compliant firms cannot hold new directorships in other listed companies.

# History of the regulation



1. Prior to 1993: Securities Contract (Regulation) Act 1956 (SCR) required a minimum public offer of at least 60% to get listed but exchanges were allowed to grant exemptions with prior approval of the government.
2. September 1993: SCR amendment brought minimum public offer to 25%. Stock exchanges could no longer grant exemptions but the government continued to have this power. The rule was relaxed to 10% for IT companies.
3. April 2000: Threshold of 10% extended to media, entertainment, and telecommunications sector.
4. June 2010: SEBI notified that all listed PSUs must maintain at least 10% public shareholding and all non-PSUs at least 25% public shareholding. PSUs were given until August 31, 2013 and non-PSUs until June 4, 2013 to comply.