

Household stock market participation in the aftermath of an accounting scandal

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Outline

- ▶ Research questions
- ▶ Research design
- ▶ Results

Part I

Research questions

Research questions

- ▶ How do investors react to major shocks in the market?
- ▶ Are investors with direct exposure to stock market fraud are more likely to decrease their participation?
- ▶ Is the reaction to fraud is an immediate response or continues to persist over long horizons?

What do we already know?

- ▶ A crisis significantly affects risk perceptions, and consequently trading behaviour (Dorn and Weber, 2013; Hoffman, Penning and Post, 2013)
- ▶ Fraud revelation lowers household participation in stock markets by lowering trust (Giannetti and Wang, 2016)
- ▶ Personally experienced outcomes are over-weighted compared to rational Bayesian learning (Kaustia and Knupfer, 2008; Malmendier and Nagel, 2016)
- ▶ However, this research suffers from two drawbacks
 - ▶ Shock studied here is an aggregate shock
 - ▶ Data is not available at high frequency

How does this paper add to the literature?

- ▶ Narrow our attention to one event, the “Enron of India” fraud, a.k.a Satyam scandal
- ▶ Daily holdings comes from the National Securities Depository Limited (NSDL).
- ▶ Allows us to identify investors who were directly exposed to the fraud
- ▶ Allows us to see the immediate response to an event

Part II

Research design

The setting

- ▶ Satyam was a successful IT company
- ▶ Promoter was the poster boy of India's IT revolution.
- ▶ On January 7, 2009, the chairman of Satyam publicly confessed that he had manipulated the accounts of the firm by US\$1.47 billion
- ▶ Investors in Satyam are said to have lost almost Rs.136 billion (US\$2 billion) over the next month

Measuring withdrawal

- ▶ Selling existing stock on the market.
- ▶ From particular “bad” sectors
- ▶ Over the long term

Outcomes

Gross traded value Total value traded by the investor

Net traded value Difference between buy and sell trades i.e. Value invested (or de-invested)

Beta from the market model with value-weighted universe of Indian stocks as the market portfolio.

Dealing with concerns: Exogenous event

- ▶ Announcement was largely a surprise, despite acquisition of two real-estate companies (Maytas Properties and Maytas Infrastructure) a few weeks prior
- ▶ Was not related to economic conditions - was a result of accounting fraud.

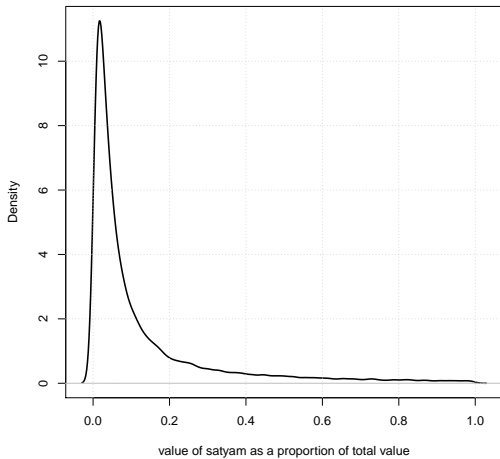
Dealing with concerns: Household preferences

- ▶ Prior to the scandal date, match households on:
 - ▶ Age in terms of number of years in the stock market
 - ▶ Trading intensity
 - ▶ Portfolio beta
 - ▶ Portfolio value (in logs)

Data

- ▶ As of 6 January, 2009, the day before the Satyam crisis, there were 5.6 million individual accounts in NSDL.
- ▶ A stratified random sample of investors from the NSDL universe.
- ▶ Sampled from each state, and oversampled Satyam investors in each state.
- ▶ Total sample of 439,461 retail investors.
- ▶ Of these 10% (40,461) investors held Satyam one day before the crisis.

Satyam shares



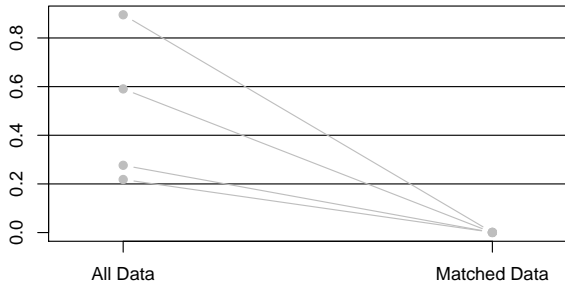
Overall sample

	Does not own Satyam	Owns Satyam	Overall
Account age	3.67 (2.86)	4.64*** (2.54)	3.75 (2.59)
Total traded value (Rs.000) between $t - 30$ and t	5.51 (77.64)	25.82*** (94.67)	7.45 (79.65)
Net traded value (Rs.000) between $t - 30$ and t	-1.05 (75.14)	2.57*** (68.33)	-7 (74.5)
Portfolio value (Rs.000)	81.44 (145.48)	210.27*** (227.09)	93.75 (159.71)
Portfolio returns between $t - 1$ and t	-0.09 (0.04)	-0.29*** (0.37)	-0.11 (0.13)
Portfolio Beta	0.88 (0.31)	0.85*** (0.23)	0.87 (0.30)
Has other IT stocks	0.18 (0.49)	0.58*** (0.38)	0.22 (0.41)
N	382,901	40,461	423,362

Match balance

	(1) Means Treated	(2) Means Control	(3) SD Control	(4) Mean Diff	(5) t-stat	(6) p-val	(7) SDIFF	(8) ks-stat	(9) p-val
Portfolio beta	0.85	0.89	0.29	-0.05	-0.12	0.90	-0.08	0.02	0.00**
Log (portfolio value)	11.46	10.06	1.75	1.39	0.12	0.00	0.084	0.004	0.90
Had traded	0.42	0.13	0.34	0.29	0.00	1	0	0	1
Account age	4.46	3.67	2.53	0.79	-0.05	0.95	-0.037	0.006	0.52

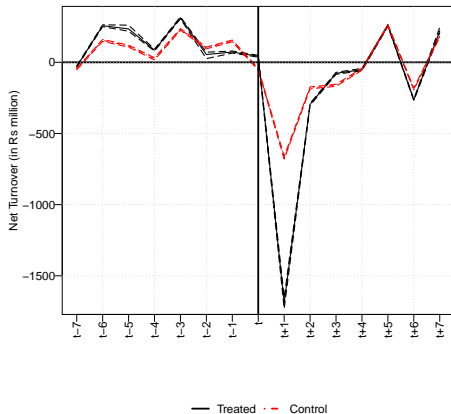
Absolute Standardized Diff in Means



Part III

Results

Net traded value overall



- ▶ Treated investors (i.e. those who held Satyam stock) sold out their equity holdings on the date of the announcement.
- ▶ Overall net traded value of treated investors was -Rs.2.1 billion,
- ▶ Of control investors was -Rs.0.9 billion.

Do investors de-invest? (7 days)

	<i>Dependent variable:</i>	
	NTV (Rs.)	NTV/Val (%)
	(1)	(2)
Treat	610.053*** (15.164)	0.5*** (0.01)
Post	-4,431.651*** (14.158)	-3.9*** (0.01)
Treat*Post	-1,386.274*** (20.018)	-1.2*** (0.01)
Constant	1,897.839*** (21.436)	1.4*** (0.01)
State FE	YES	YES
Observations	1,048,090	1,048,090
Residual Std. Error (df = 1048067)	3,933.966	0.027

- ▶ Average amount de-invested relative to control group is Rs.1387.
- ▶ De-investment of 36% relative to the pre-event average

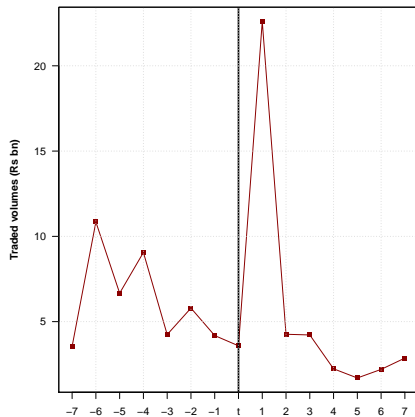
Does de-investing vary with exposure?

<i>Dependent variable:</i>					
NTV (Rs.)					
	(1)	(2)	(3)	(4)	(5)
Treat*Post	-939.107*** (76.706)	-705.770*** (54.983)	-627.435*** (39.176)	-738.079*** (26.015)	-1,730.751*** (22.345)

<i>Dependent variable:</i>					
NTV/val (%)					
	(1)	(2)	(3)	(4)	(5)
Treat*Post	-0.2*** (0.02)	-0.2*** (0.02)	-0.4*** (0.03)	-1.1*** (0.03)	-7.5*** (0.05)
Observations	210,229	210,238	210,091	209,757	207,775

- ▶ The greater the exposure to Satyam, the larger is the de-investment.

Trading on Satyam



- ▶ Treated investors de-invested Rs.-1.1 billion of Satyam. This is almost 57% of the net traded value.
- ▶ Control group showed a positive net traded value, or Rs.22 million.
- ▶ Suggests they actually bought Satyam - probably saw this as an opportunity to buy depressed stock

Is de-investing largely about Satyam stock?

	<i>Dependent variable:</i>
	NTV Satyam (Rs.)
Post	-372.773*** (5.806)
Exposure Q2:post	-265.923*** (8.211)
Exposure Q3:post	-450.003*** (8.211)
Exposure Q4:post	-682.936*** (8.213)
Exposure Q5:post	-1,453.275*** (8.234)
Constant	123.304*** (5.605)
State FE	YES
Observations	524,616
Residual Std. Error	713.566 (df = 524597)

Does de-investing get carried over to other IT stocks? (7 days)

	<i>Dependent variable:</i>	
	NTV (IT stocks) (1)	NTV (Non-IT stocks) (2)
Treat	3.106*** (0.046)	-27.771** (12.172)
Post	-4.317*** (0.043)	-4,017.202*** (11.361)
Treat*Post	-3.914*** (0.060)	79.760*** (16.065)
Constant	2.232*** (0.065)	1,702.591*** (17.202)
State FE	YES	YES
Observations	1,048,876	1,048,876
Residual Std. Error (df = 1048853)	9.213	3,194.085

- ▶ Low impact on other IT stocks
- ▶ Treated investors actually buy more of other non-IT stock

Does de-investing last over time?

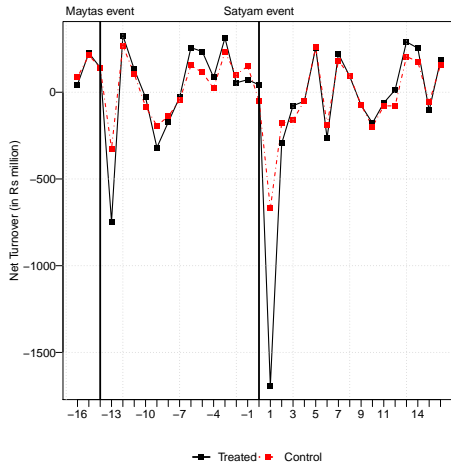
	<i>Dependent variable:</i>	
	NTV (Rs.)	NTV/Val (%)
	(1)	(2)
Treat	-28.409*** (5.030)	-0.03*** (0.004)
Post	-688.743*** (4.487)	-0.7*** (0.004)
Treat*Post	19.290*** (6.345)	0.1*** (0.01)
Constant	215.403*** (6.895)	0.2*** (0.01)
State FE	YES	YES
Observations	6,227,014	6,227,014
Residual Std. Error (df = 6226991)	2,876.082	0.031

- ▶ The net sales have reversed
- ▶ Treated investors are now actually buying more!

Part IV

Threats to validity

Was it some other event?



Unobservables driving the result?

Restrict control group to those who once held Satyam

	<i>Dependent variable:</i>	
	NTV (Rs.)	NTV/Val (%)
	(1)	(2)
Treat	234.814*** (46.598)	0.5*** (0.0003)
Post	-5,525.820*** (55.201)	-3.9*** (0.0004)
Treat*Post	-555.548*** (57.496)	-1.2*** (0.0004)
Constant	2,386.222*** (51.102)	1.5*** (0.0003)
State FE	YES	YES
Observations	568,795	568,795
Residual Std. Error (df = 568772)	4,554.330	0.030

Part V

Way forward

Conclusion

- ▶ We find a huge impact on those exposed to fraud
- ▶ These investors sell the “bad” stock
- ▶ The sales increase by exposure
- ▶ The sales are reversed within a month
- ▶ Suggests that the impact is short-lived
- ▶ Investors don't really extrapolate to other stocks

Questions/comments?