Stock market reaction to capital raise announcements:

Evidence from Tehran Stock Exchange

S.M. Aghajanzadeh M. Heidari A. Ebrahimnejad

Tehran Institute for Advanced Studies

March, 2021

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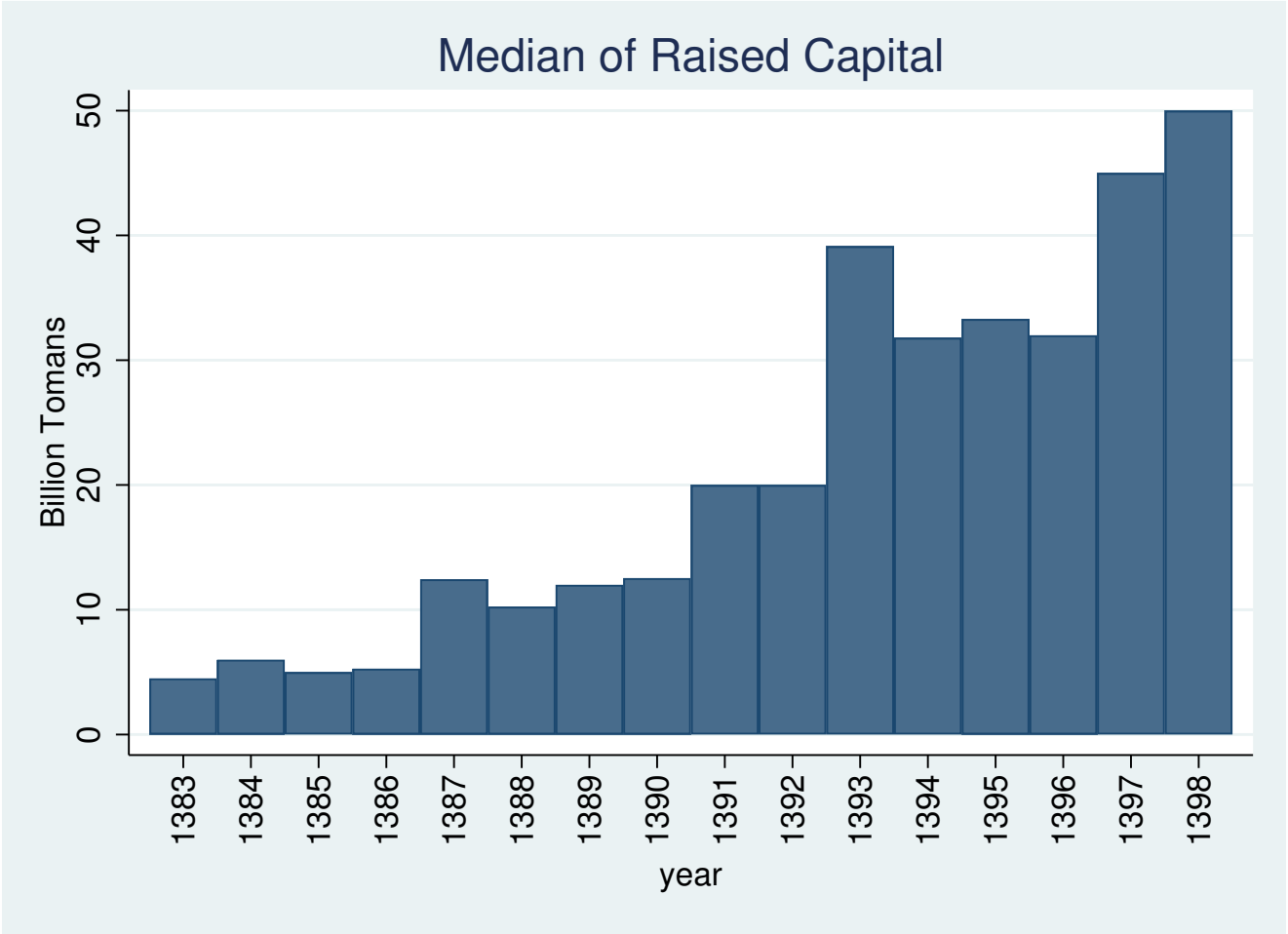
Data

- Data consist of 1413 capital raise for 448 companies
- Four different sources for capital rising: Cash, Resereves, Cash & Resereves , and Revaluation

	Cash	Resereves	Cash & Resereves	Revaluation	Sum
Event	754	408	180	67	1410
Percent	53.4	28.9	12.7	5	100

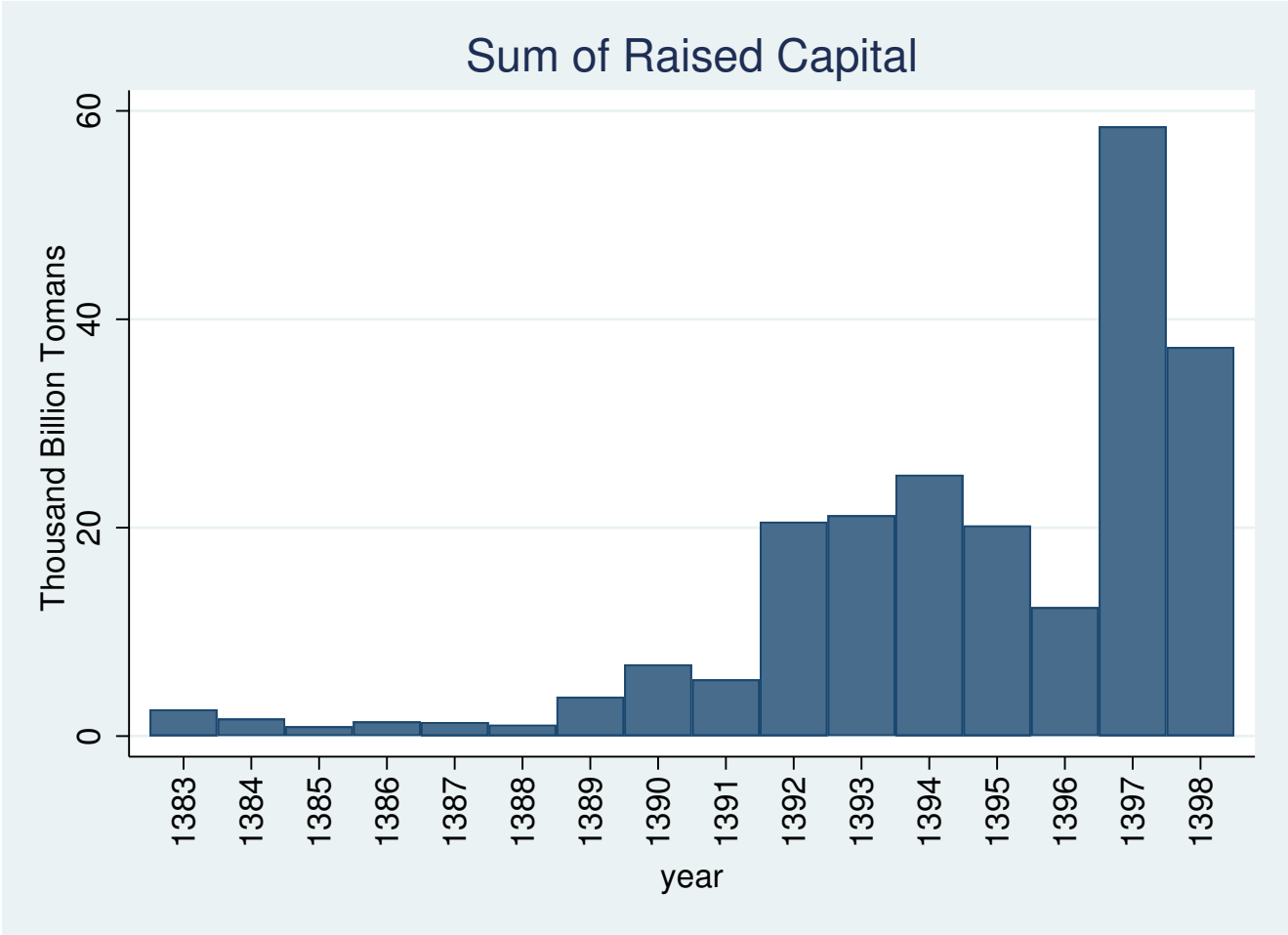
Data Summary

Raised Capital for each Firm



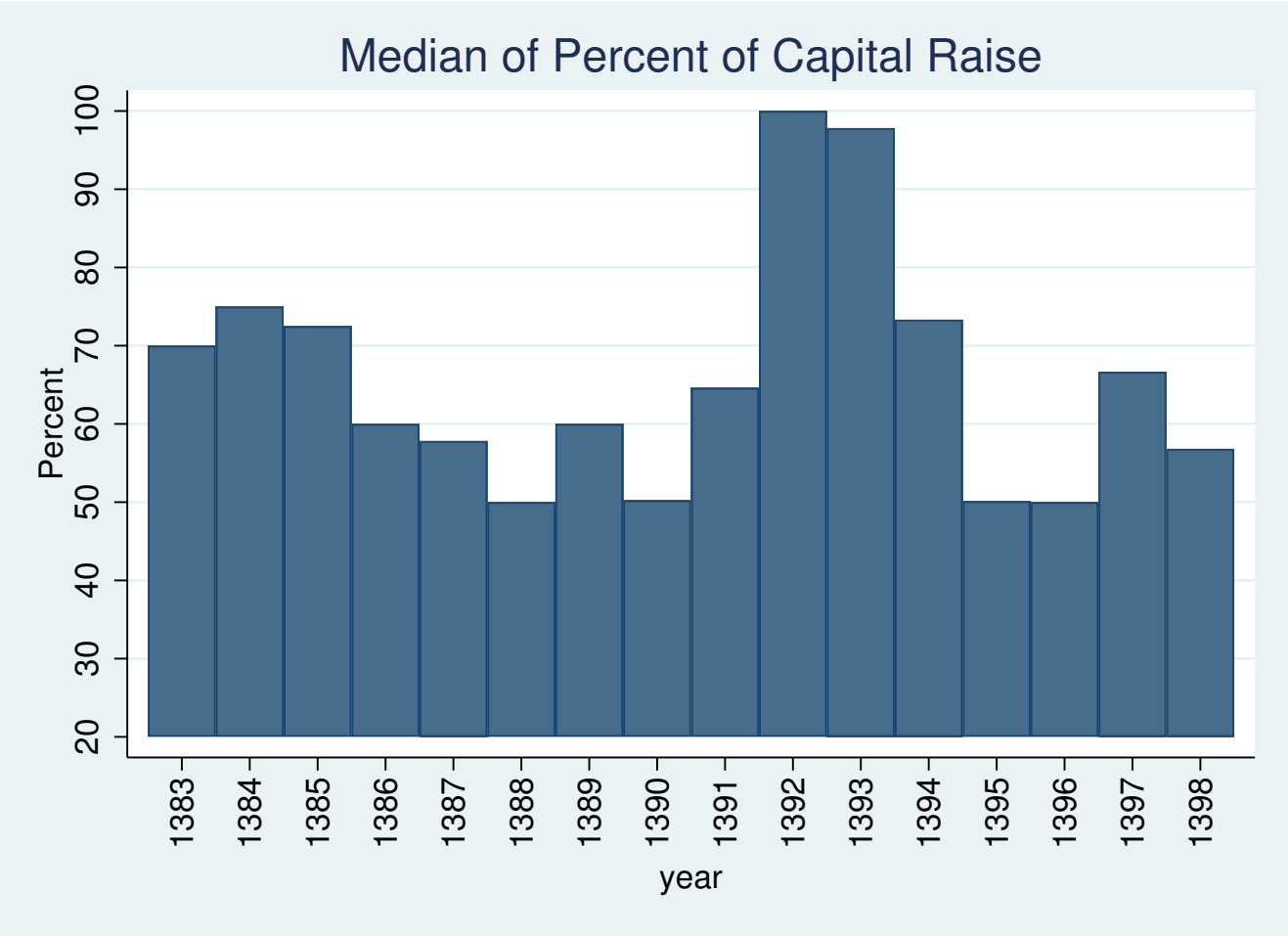
Data Summary

Value of Raised Capital in market



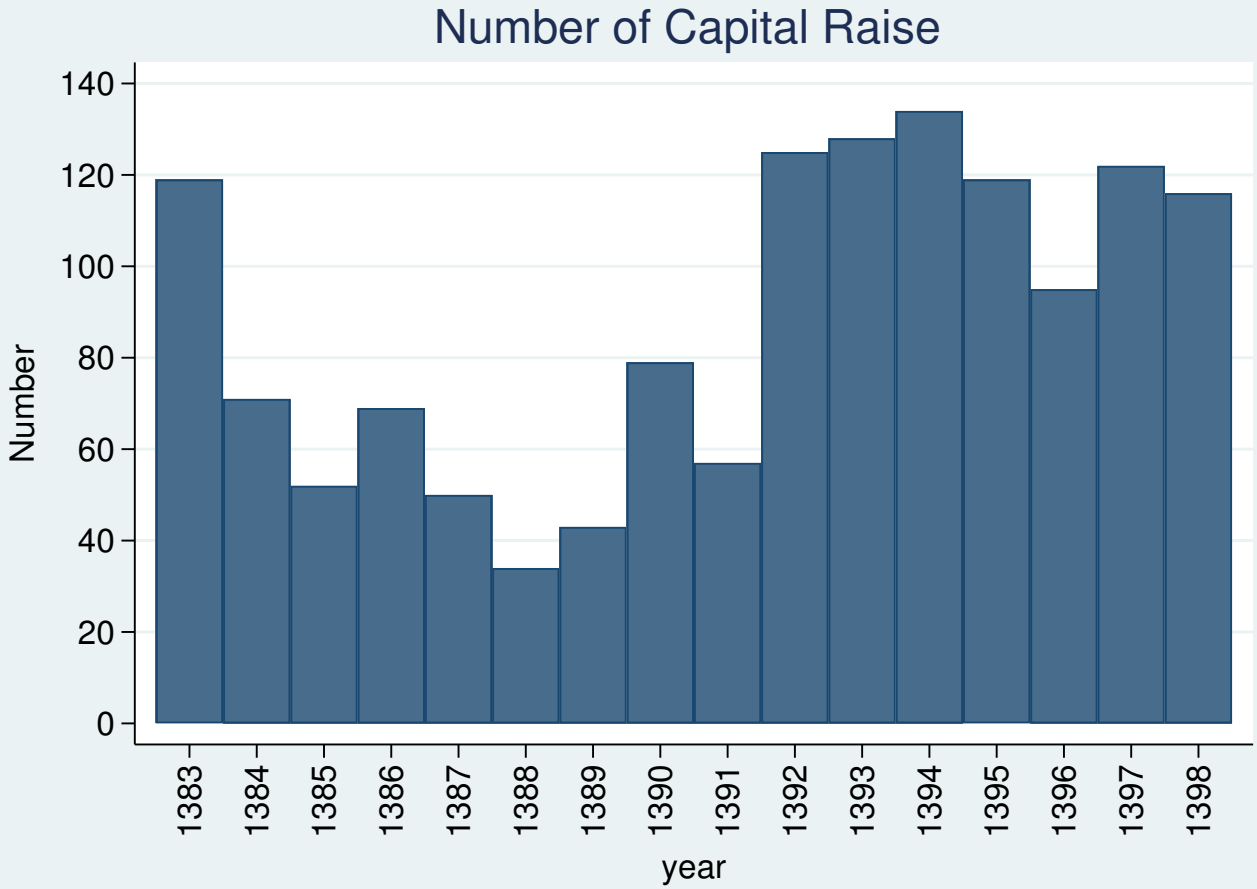
Data Summary

Percent of Raised Capital for each Firm



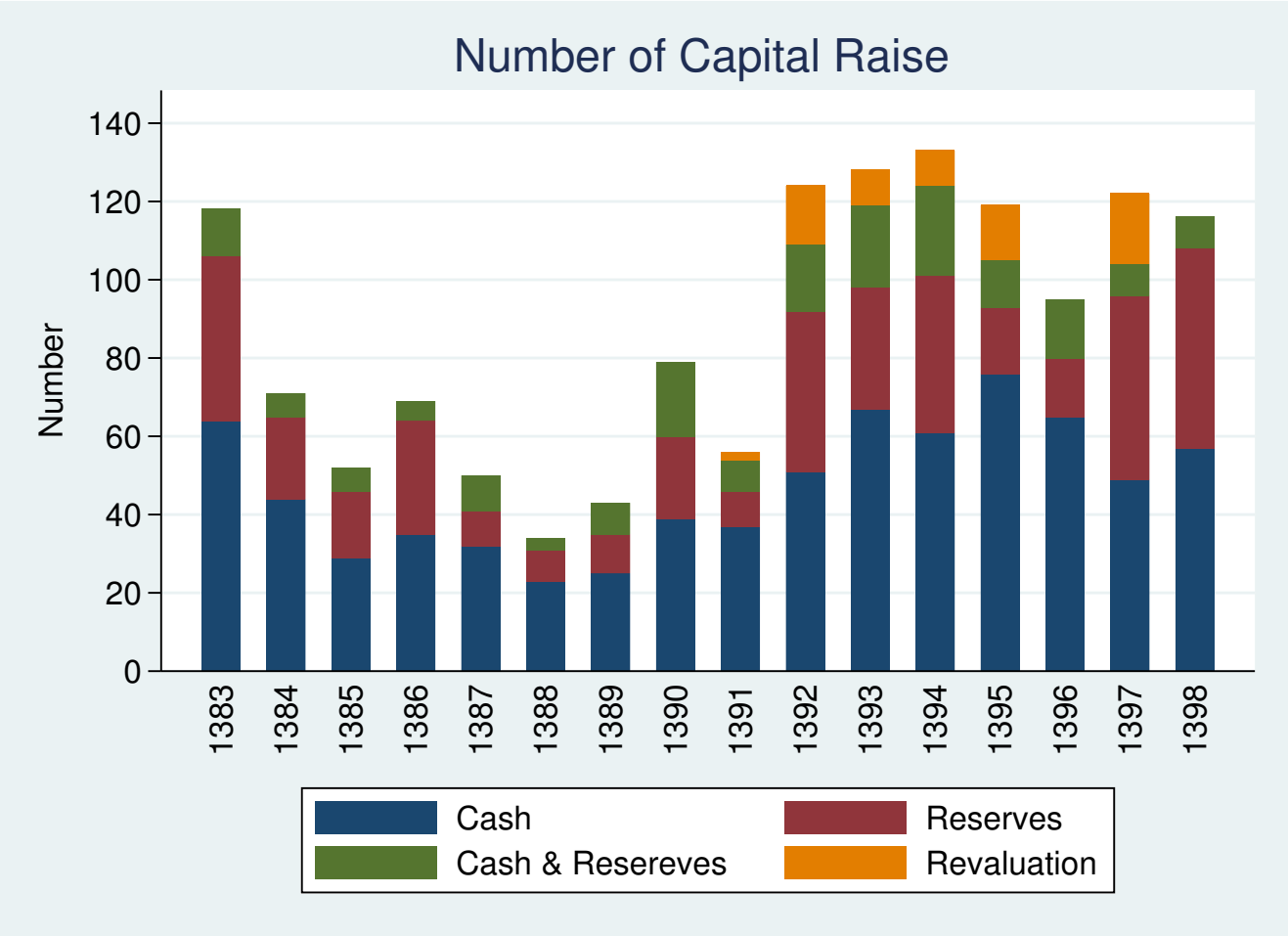
Data Summary

Number of Capital Raise

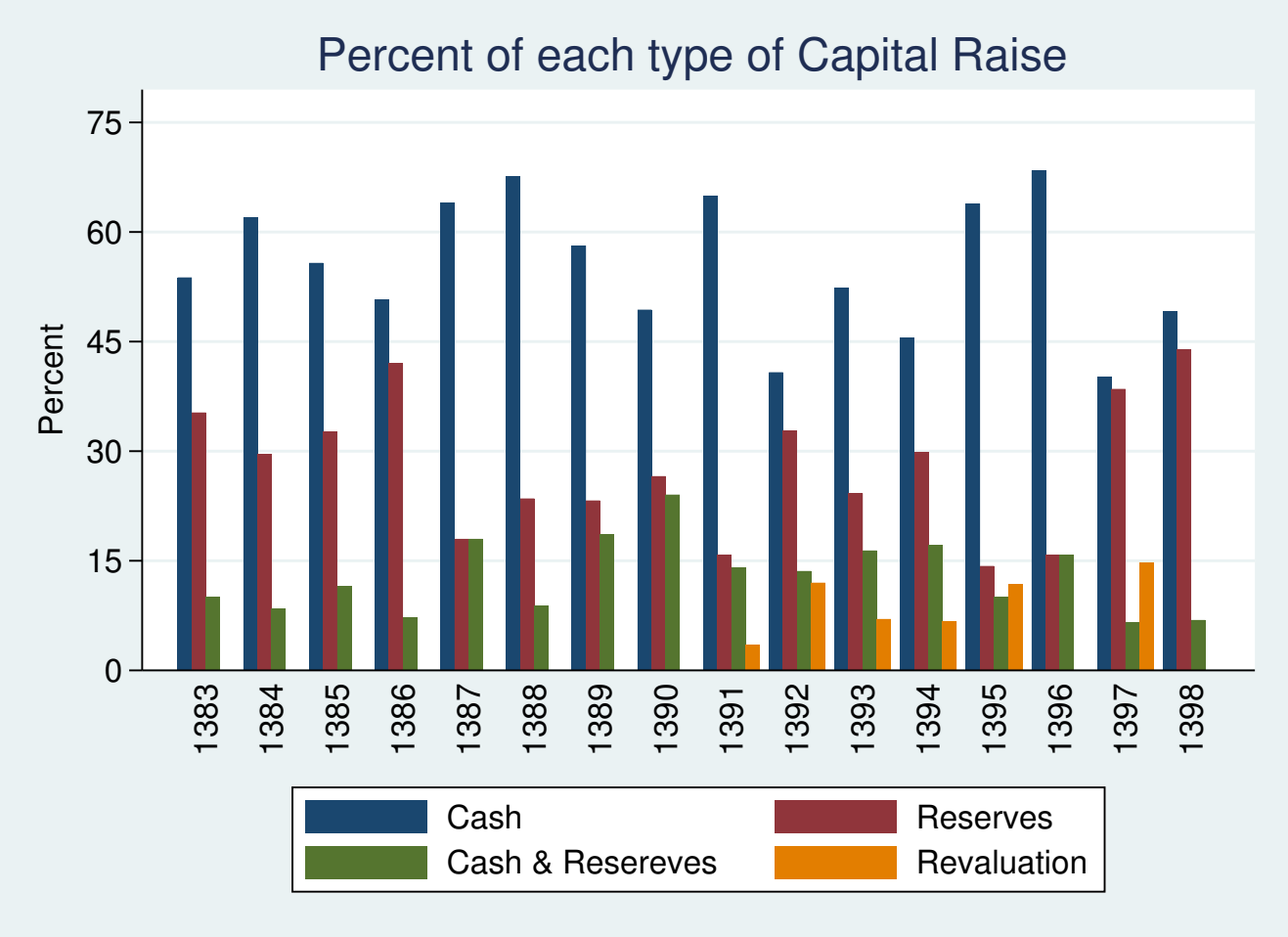


Data Summary

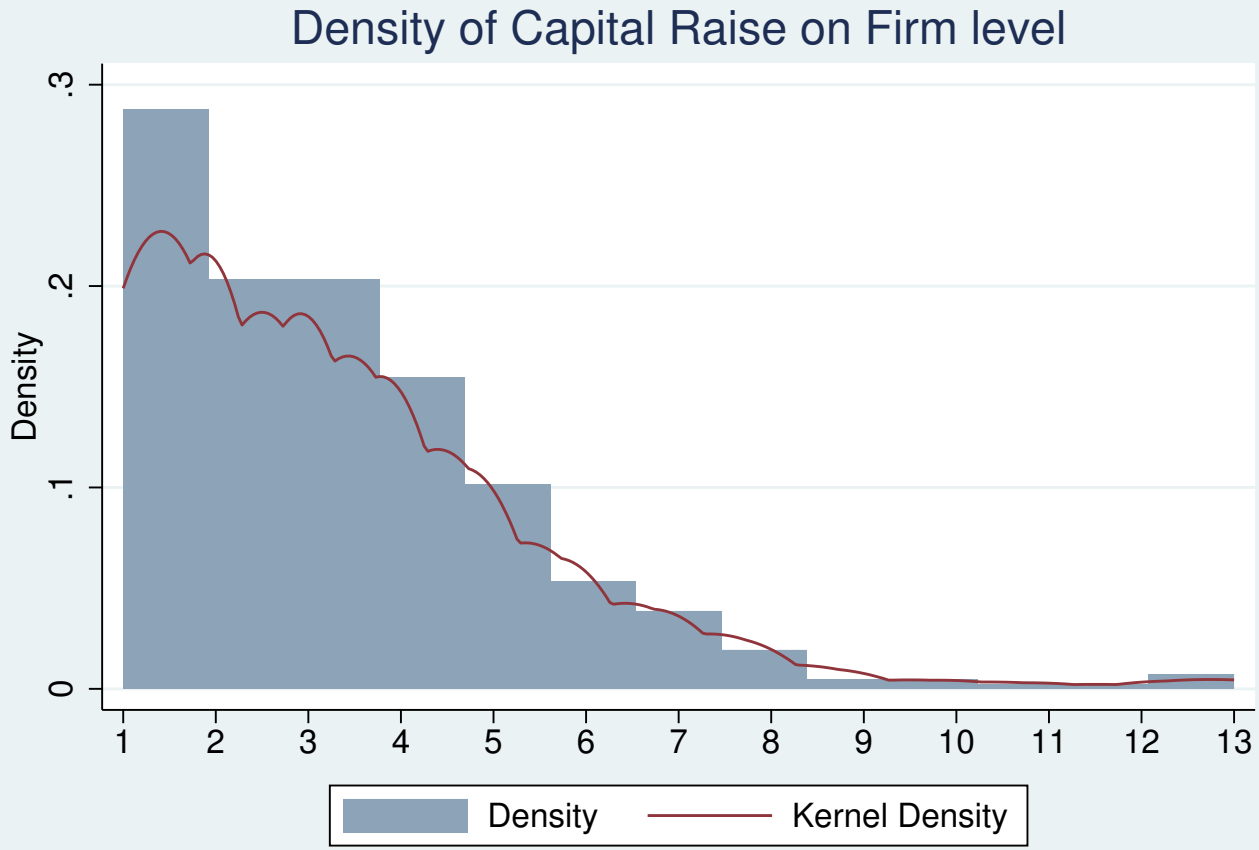
Number of Capital Raise



Number of Capital Raise



Number of Capital Raise for each Firm



This figure graphs the histogram of number of capital raise for each firm.

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Abnormal Return

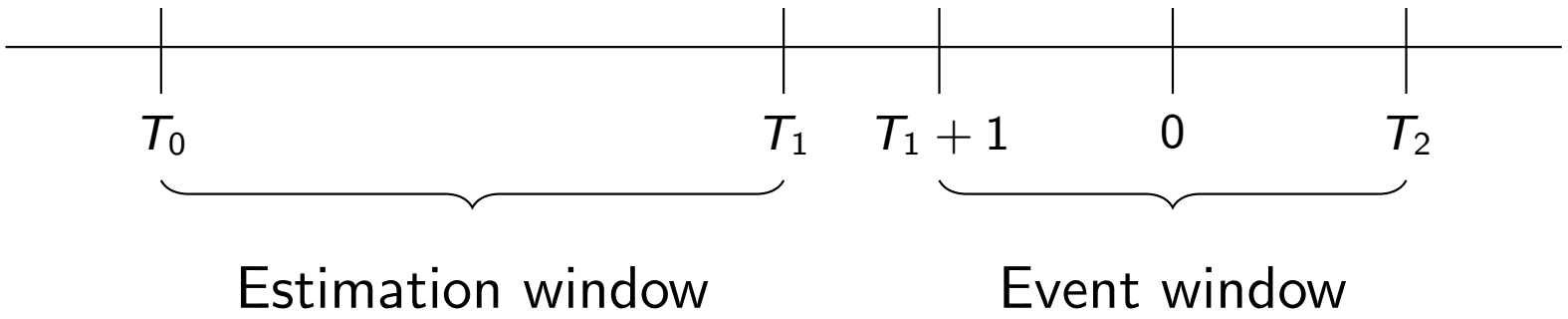
- Abnormal return is the difference between the observed return and the predicted return

$$AR_{i,t} = R_{i,t} - E(R_{i,t}|X_t)$$

- Predicted return
  - Mean-adjusted returns Model (MAR) $\longrightarrow \bar{R}_i$
  - Market-adjusted returns Model (MKAR) $\longrightarrow R_{M,t}$
  - Risk-adjusted returns Model (RAR) $\longrightarrow \alpha_i + \beta_i R_{M,t}$

Abnormal Return Calculation

First Step



- Event windows specifically 3-day, 7-day, and 11-day event periods
- Estimation window : Each event window implies a particular estimation window interval. (For example, 3-day event window [-1,+1] is associated with [-122,-2] estimation window)
- Fama,Fisher,Jensen, and Roll use Event Window as Estimation window [IER-1969-The Adjustment of Stock Prices to New Information]

Abnormal Return Calculation

Second Step

- For each Firm :

$$R_{i,t} = \hat{\alpha}_i + \hat{\beta}_i(R_{m,t}) + \boxed{\varepsilon_{i,t}} \rightarrow AR_{i,t}$$

- Average abnormal return during period t: N_t is the number of firms in the sample during period t

$$AAR_t = \sum_{i=1}^{N_t} \frac{AR_{it}}{N_t}$$

- Cumulative Abnormal Returns

$$CAR_t(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}$$

- Cumulative Average Abnormal Return from period t_1 to period t_2

$$CAAR_{t_1,t_2} = \sum_{i=t_1}^{t_2} CAR_i(t_1, t_2)$$

Abnormal Return Calculation

Cross-Sectional Test (Test $AAR = 0$)

- Hypothesis is $\begin{cases} H_0: & AAR = 0 \\ H_1: & AAR \neq 0 \end{cases}$
- The t-statistics for this test is
  - $t_{AAR} = \sqrt{N}\frac{AAR}{S_{AAR}}$
  - $S^2_{AAR} = \frac{1}{N-1}\sum_{i=1}^{N}(AR_i - AAR)^2$

Abnormal Return Calculation

Cross-Sectional Test (Test $CAAR = 0$)

- Hypothesis is $\begin{cases} H_0: & CAAR = 0 \\ H_1: & CAAR \neq 0 \end{cases}$
- The t-statistics for this test is
  - $t_{CAAR} = \sqrt{N}\frac{CAAR}{S_{CAAR}}$
  - $S^2_{CAAR} = \frac{1}{N-1}\sum_{i=1}^{N}(CAR_i - CAAR)^2$
  - $CAR_i = \sum_{i=t_1}^{t_2} AR_{i,t}$

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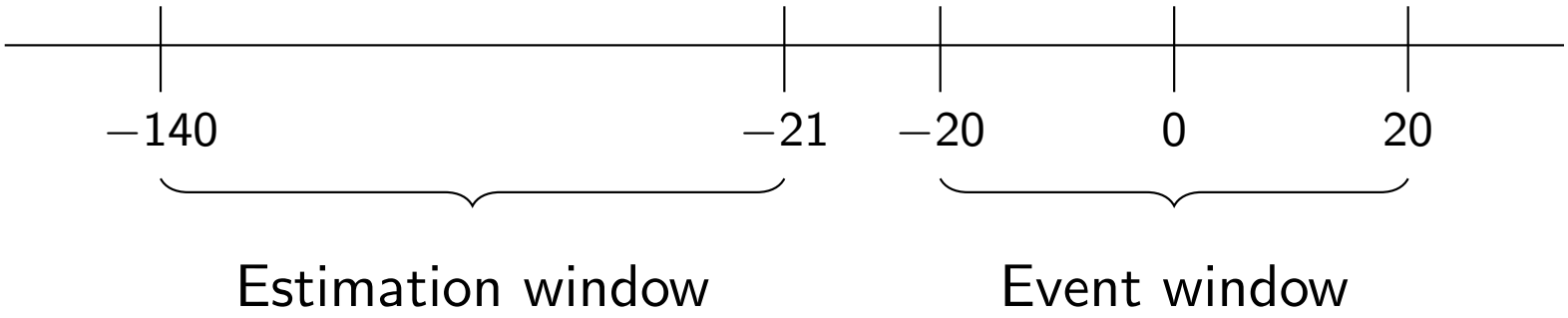
Abnormal Return

- We use the Risk-adjusted returns Model (CAPM) to predict returns.
  - We accumulate factors' return in close days for using in the model.
- We set estimation and event window as:



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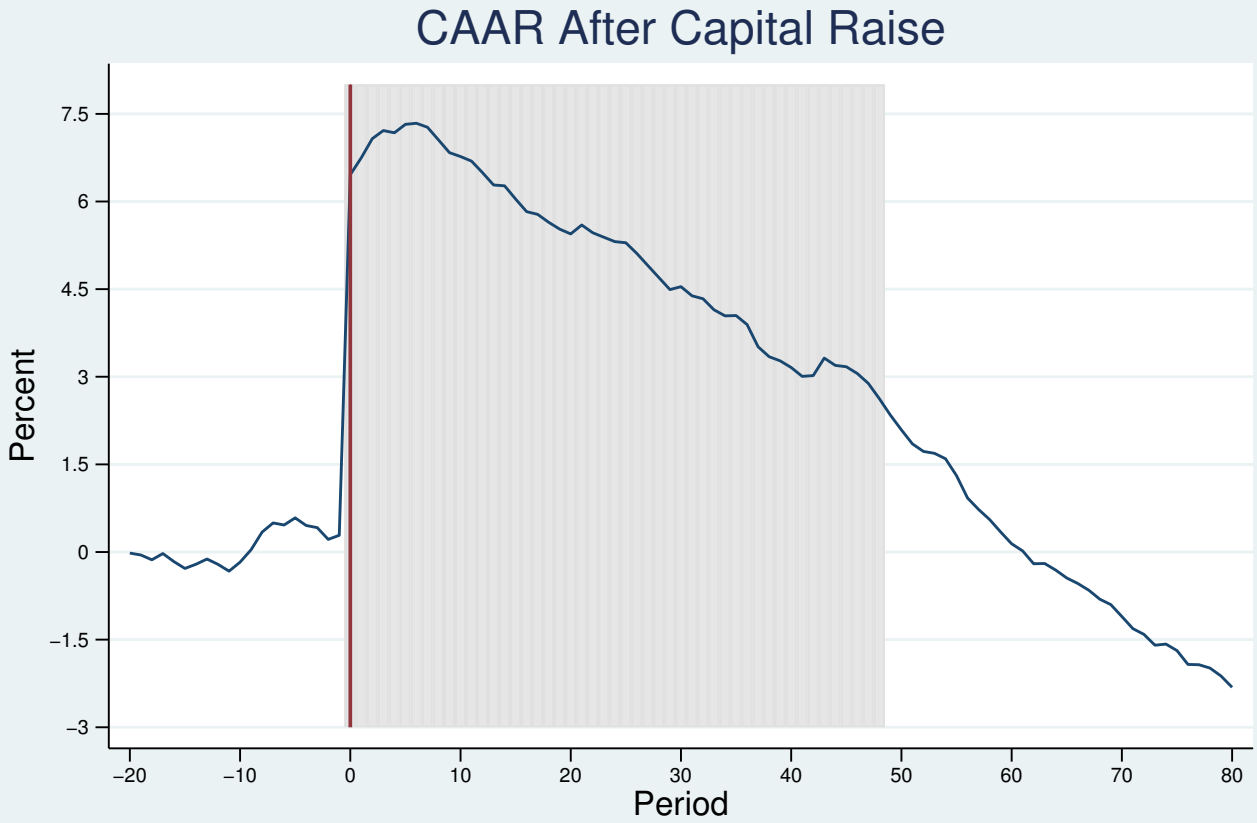
- We test whether $CAAR = 0$ or not

Abnormal Return

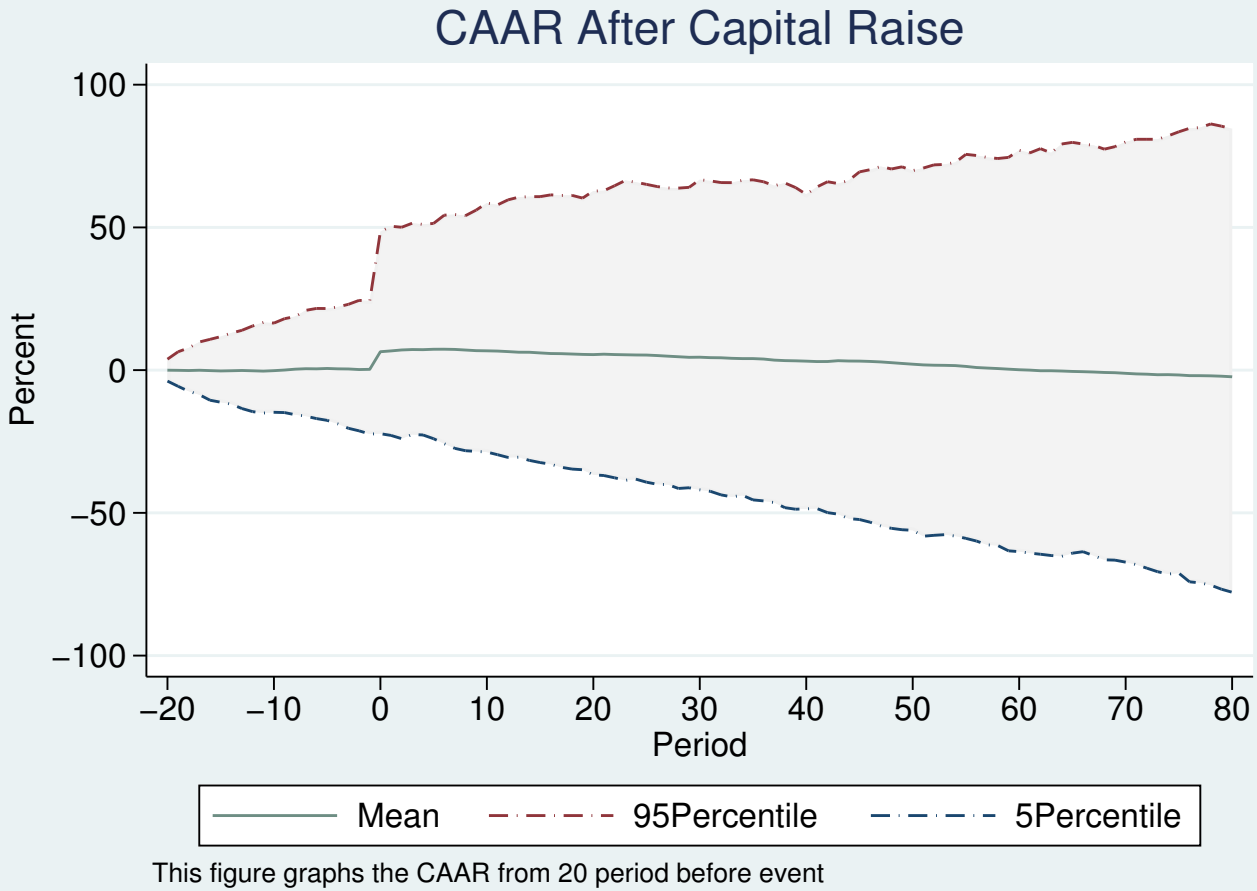


This figure graphs the CAAR from 20 period before event.
The gray area represents significant returns in 5%

Analysis of abnormal return in days surrounding the capital raise announcements

Period	AAR	CAAR	Number	Period	AAR	CAAR	Number
-20	-0.01	-0.01	997	0	7.42	7.39	1015
-19	-0.07	-0.07	999	1	0.30	7.69	1015
-18	-0.07	-0.14	1000	2	0.32	8.01	1015
-17	0.10	-0.03	999	3	0.14	8.17	1014
-16	-0.17	-0.20	1000	4	-0.04	8.14	1014
-15	-0.10	-0.30	1001	5	0.16	8.26	1012
-14	0.05	-0.25	1002	6	-0.02	8.24	1012
-13	0.04	-0.21	1004	7	-0.06	8.18	1012
-12	-0.10	-0.32	1005	8	-0.26	7.98	1010
-11	-0.14	-0.45	1005	9	-0.27	7.71	1010
-10	0.13	-0.33	1004	10	-0.08	7.65	1009
-9	0.18	-0.14	1004	11	-0.11	7.54	1008
-8	0.28	0.14	1005	12	-0.25	7.29	1008
-7	0.14	0.27	1005	13	-0.21	7.09	1007
-6	-0.08	0.21	1005	14	-0.07	6.98	1004
-5	0.12	0.32	1007	15	-0.16	6.82	999
-4	-0.08	0.25	1009	16	-0.26	6.50	996
-3	-0.09	0.17	1010	17	-0.07	6.44	996
-2	-0.23	-0.06	1010	18	-0.19	6.26	995
-1	0.04	-0.03	1012	19	-0.11	6.15	995

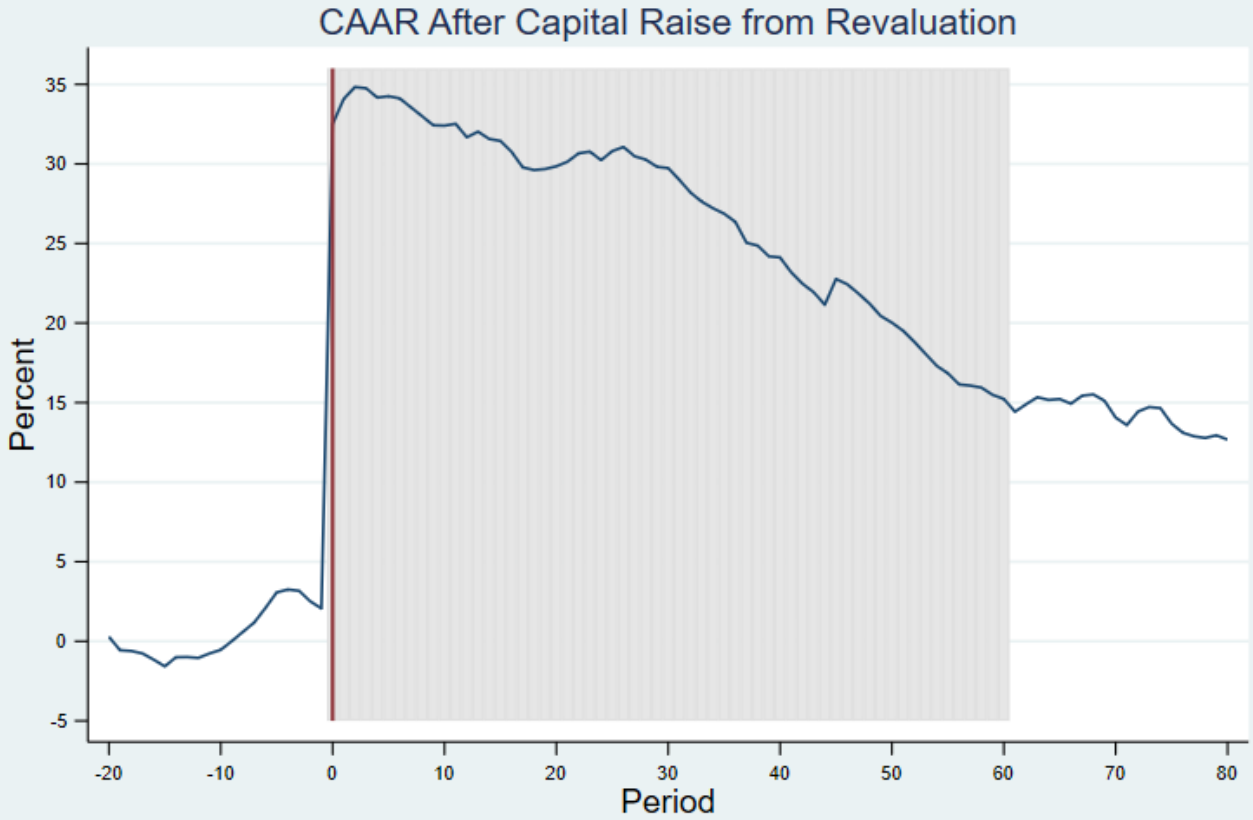
Abnormal Return



This figure graphs the CAAR from 20 period before event

Abnormal Return

Abnormal return of raised capital from Revaluation



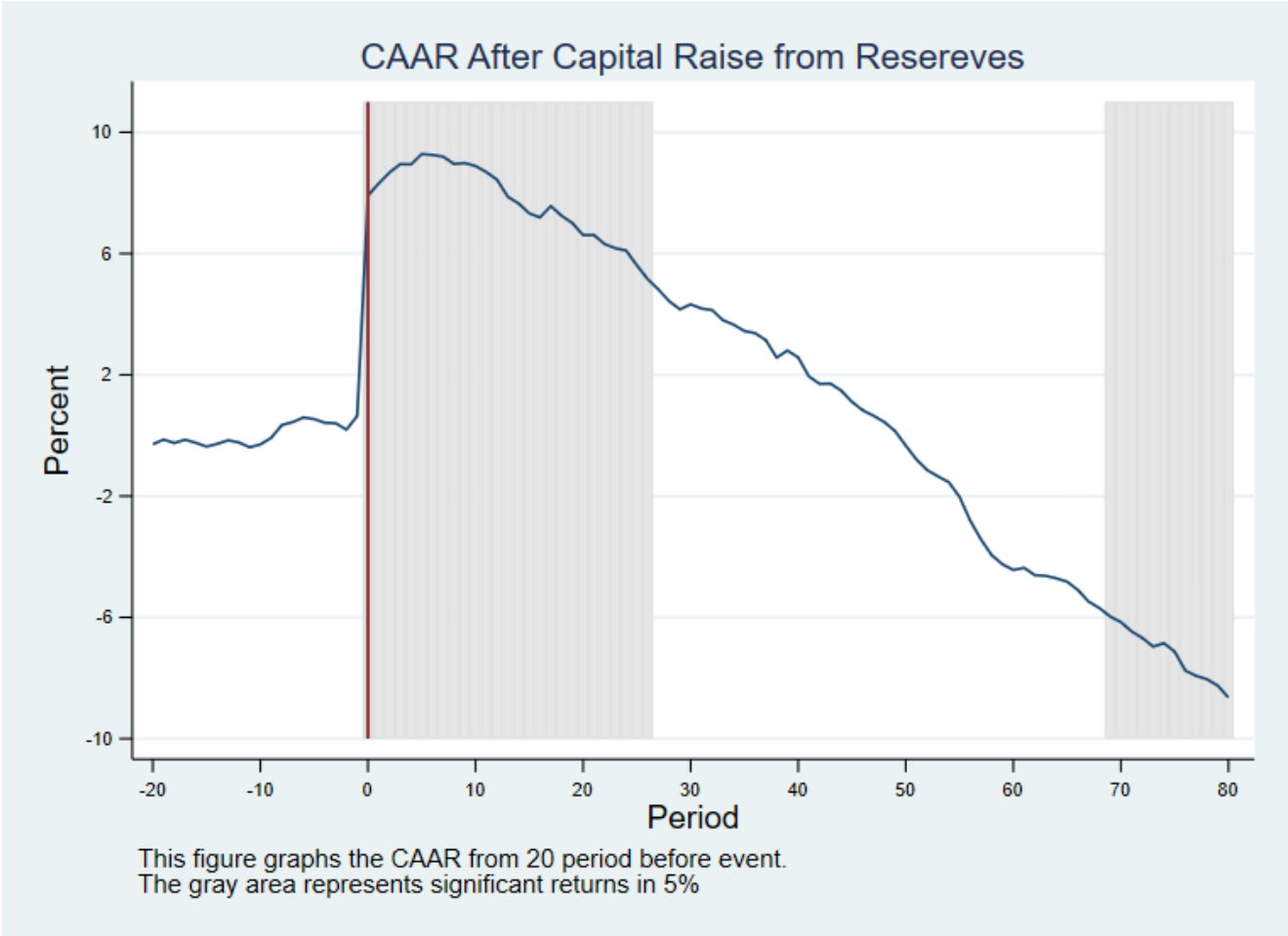
This figure graphs the CAAR from 20 period before event.
The gray area represents significant returns in 5%

Analysis of abnormal return in days surrounding the Revaluation announcements

Period	AAR	CAAR	Number	Period	AAR	CAAR	Number
-20	0.33	0.33	60	0	30.33	32.79	61
-19	-0.97	-0.64	60	1	1.61	34.40	61
-18	-0.19	-0.83	61	2	0.93	35.34	61
-17	-0.25	-1.05	60	3	-0.10	35.24	61
-16	-0.50	-1.54	60	4	-0.57	34.67	61
-15	-0.33	-1.87	60	5	0.03	34.70	61
-14	0.63	-1.24	60	6	-0.15	34.55	61
-13	0.10	-1.14	60	7	-0.45	34.09	61
-12	0.03	-1.10	60	8	-0.38	33.71	61
-11	0.27	-0.83	60	9	-0.61	33.10	61
-10	0.29	-0.54	60	10	0.10	33.20	61
-9	0.59	0.05	60	11	-0.09	33.11	61
-8	0.84	0.89	60	12	-0.35	32.77	61
-7	0.87	1.76	60	13	0.60	33.37	61
-6	0.79	2.55	60	14	-0.07	33.30	61
-5	0.93	3.49	60	15	0.07	32.86	60
-4	0.09	3.57	61	16	-0.58	32.29	60
-3	0.05	3.62	61	17	-0.62	31.67	60
-2	-0.63	2.99	61	18	-0.05	31.62	60
-1	-0.53	2.46	61	19	0.33	31.95	60

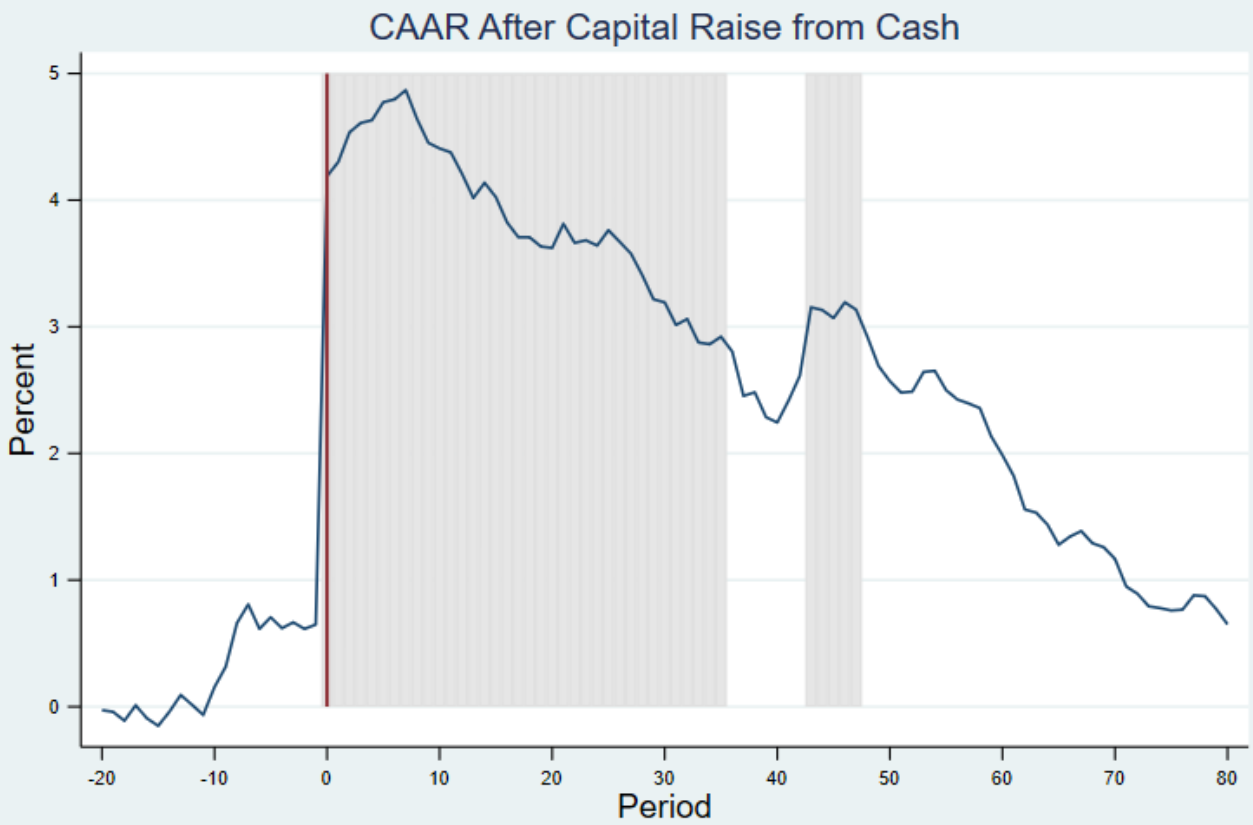
Abnormal Return

Abnormal return of raised capital from Reserves



Abnormal Return

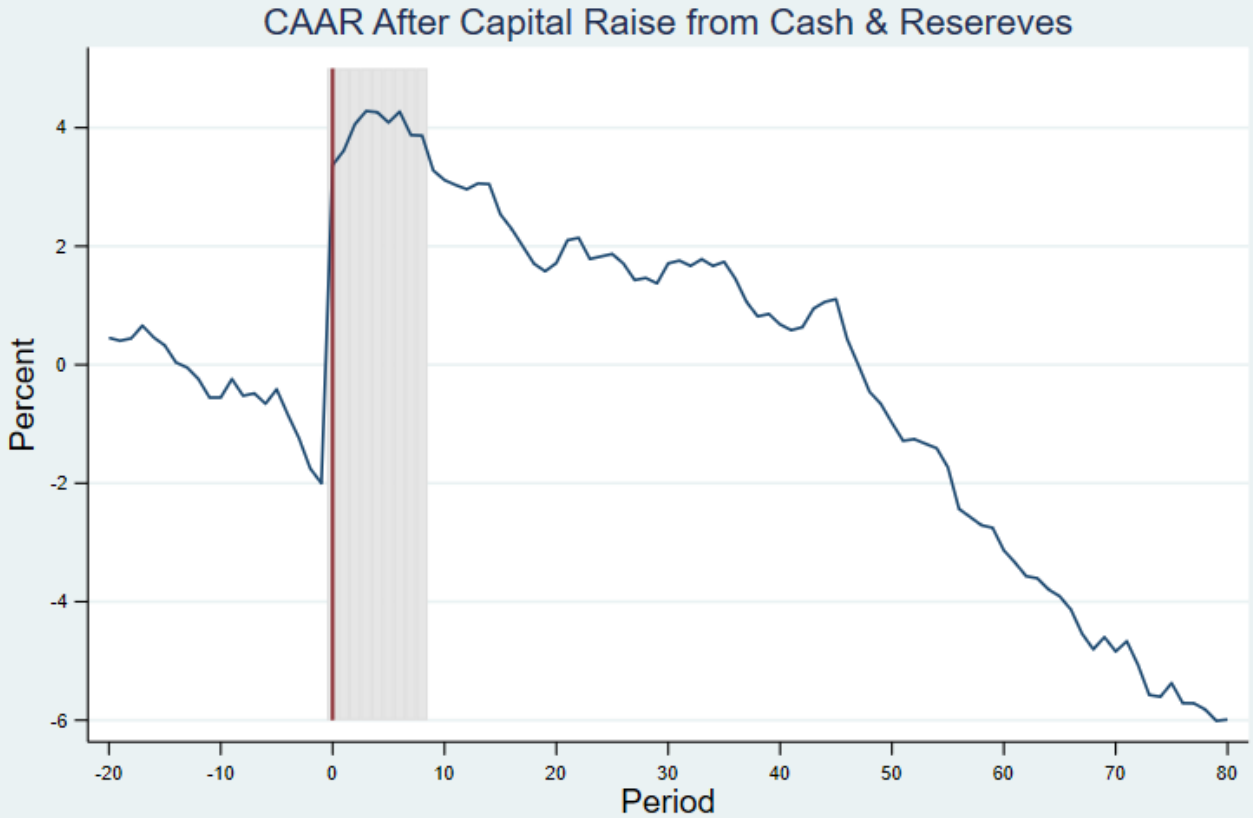
Abnormal return of raised capital from Cash



This figure graphs the CAAR from 20 period before event.
The gray area represents significant returns in 5%

Abnormal Return

Abnormal return of raised capital from Cash & Reserves



This figure graphs the CAAR from 20 period before event.
The gray area represents significant returns in 5%

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Mean of Abnormal Return

	Size Quantile					
Market Condition	$1_{(\text{Low})}$	2	3	4	$5_{(\text{High})}$	Row average
Bad	13.0	7.3	4.5	1.3	2.8	5.9
Good	13.7	7.7	4.6	2.9	3.2	6.3
Column average	13.5	7.6	4.6	2.4	3.0	6.2

Mean of Abnormal Return

	Book-to-Market Quantile					
Size Quantile	$1_{(Low)}$	2	3	4	$5_{(High)}$	Row average
$1_{(Low)}$	18.4	8.6	8.8	16.3	11.6	13.5
2	8.2	8.4	7.3	7.7	6.1	7.6
3	4.3	5.1	2.5	3.3	8.3	4.6
4	4.8	-2.0	1.8	2.2	4.0	2.4
$5_{(High)}$	2.2	4.5	0.8	1.8	5.1	3.0
Column average	9.9	5.8	4.2	4.7	6.1	6.2

Mean of Abnormal Return

	P/E Quantile					
Size Quantile	$1_{(Low)}$	2	3	4	$5_{(High)}$	Row average
$1_{(Low)}$	17.0	11.8	29.9	8.5	7.9	13.3
2	15.0	8.1	3.0	8.7	5.4	8.0
3	0.3	-0.5	5.3	6.5	6.8	4.0
4	-2.3	2.2	-1.1	3.0	3.1	0.9
$5_{(High)}$	2.4	-0.4	3.6	1.1	6.7	2.5
Column average	7.1	3.3	5.1	5.7	5.9	5.4

Mean of Abnormal Return

	Book-to-Market Quantile					
P/E Quantile	$1_{(Low)}$	2	3	4	$5_{(High)}$	Row average
$1_{(Low)}$	15.4	3.3	3.7	6.3	4.6	7.1
2	4.0	2.9	5.1	2.0	1.6	3.3
3	11.8	4.3	1.5	2.5	4.2	5.1
4	4.8	6.5	2.9	8.6	5.5	5.7
$5_{(High)}$	10.2	7.0	2.3	4.8	5.9	5.9
Column average	9.6	4.7	3.2	4.6	4.8	5.4

	CAPM		4Factor	
	(1)	(2)	(3)	(4)
Good	0.673	0.412	1.141	0.407
	(0.43)	(0.29)	(0.71)	(0.27)
Size Quantile=2	-4.643	-4.840*	-3.399	-4.125
	(-1.71)	(-2.49)	(-1.18)	(-1.73)
Size Quantile=3	-7.893*	-6.971**	-7.406*	-5.986*
	(-2.58)	(-3.06)	(-2.38)	(-2.54)
Size Quantile=4	-10.55**	-9.099***	-10.22**	-8.159**
	(-3.31)	(-3.95)	(-3.05)	(-3.27)
Size Quantile=5	-10.12**	-9.205***	-9.450**	-7.808**
	(-3.20)	(-4.31)	(-2.93)	(-3.46)
Resereves	2.278	2.882	2.078	2.903
	(1.19)	(1.70)	(1.14)	(1.80)
Cash & Resereves	1.547	0.920	0.984	0.936
	(1.07)	(0.75)	(0.66)	(0.70)
Revaluation	23.09***	20.45***	26.05***	25.48***
	(3.64)	(3.66)	(3.75)	(4.46)
Constant	12.35**	11.15***	12.89**	9.527**
	(3.51)	(4.01)	(3.40)	(3.07)
Observations	758	1009	758	1009

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$