



# Margin Trading and Corporate Investments: Evidence from a Quasi-natural Experiment in China

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December 13, 2018



# Research questions

Do trading activities matter for corporate decisions?

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- Does trading activity on Wall Street influence corporate policies in financing, investment, and organizational practices on Main Street?
- The relation between financial markets and the real economy (mainly in corporate investment)
  - Chen, Goldstein & Jiang (2007)
  - Bakke & Whited (2010)
  - Bond, Edmans & Goldstein (2012)
  - Foucault & Fresard (2014)
- Few studies have reliably estimated the real impact from the stock market to the firm due to a lack of identification strategies for exogenous shocks
  - Edmans, Goldstein & Jiang (2012)  
Mutual fund flows → Stock price changes → Takeovers
  - Derrien & Kecskés (2013)  
Brokerage M&As → Analyst coverage → Investments ↻ 🔍 ↺



# Evidence in the U.S.

## Regulation SHO program

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- The Securities and Exchange Commission (SEC) adopted a new regulation governing short selling activities in the U.S. equity markets in July 2004
    - Regulation SHO allowed stocks in the pilot program exempted from short-sale price tests between May, 2005 and August, 2007
  - Studies employ SHO pilot program as an exogenous shock to examine the effects of short selling on
    - Market quality: Alexander & Peterson (2008)
    - Short-sale trades and volume: Diether et al. (2009)
    - Bond yields: Kecskés et al. (2013)
    - Earnings mgmt: Fang et al. (2015), Masa et al. (2015)
    - Insider trading: Masa et al. (2015)
    - Small firms: Grullon et al. (2015)
- Short-selling $\uparrow$   $\rightarrow$  Price $\downarrow$   $\rightarrow$  Equity issues & investment $\downarrow$



# Background in China

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- On March 31, 2010, the China Securities Regulatory Commission (CSRC) introduces the pilot program of margin trading and short selling to help incorporate more information into stocks prices
- Initially, 90 blue chip stocks are selected in the program in 2010. After several rounds of qualification standards loosening, there are a total of 900 stocks included in the pilot program in September 2014
- The lift of the margin-trading and short-selling bans reduced stock return volatility and enhanced market liquidity
  - Chang et al. (2014)
  - Wang & Wei (2017)
- Similar effects in India: Kahraman & Tookes (2017)



# Hypothesis Development

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- An increase in margin trading activity improves liquidity and reduces information asymmetry and thus the cost of equity capital becomes lower
- A more informative and a higher level of equity price can help drive down the cost of debt capital (Sunder 2004)
- Investments of financially constrained firms are less responsive to investment opportunities because external financing is costly. Thus, the benefit of a reduction in external financing costs could be greater for financially constrained firms (Hubbard 1998)
- Price efficiency increased for firms that were included in the pilot program (Wang & Wei 2017)



# Hypothesis Development

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- Increase in trading activity on the secondary markets helps reduce information asymmetry and, hence, the cost of external financing. This, in turn, improves the profitability of investment opportunities and the optimal amount of corporate investment and associated financing
- Such effects depend on the degree of financing constraints at the time of the shocks in capital markets



# Preview of Main Findings

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- The level of corporate investments including capital and R&D expenditures increased after margin trading and short selling are allowed. More importantly, the effects mainly come from margin trading activity
- We use the leveraged mutual fund ownership to instrument for margin trading and find a significantly positive relationship between margin trading eligibility and the level of investment
- The positive relationship between margin trading and corporate investments is more significant in firms with higher degree of financial constraints
- We attribute the willingness to increase capital and R&D expenditures to that firms can raise debt capital at a lower cost



# Sample

## Treatment Group

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- Our study covers the period from January 1, 2006 through December 31, 2014. (PRE period, DURING period, indicator variable PILOT)
- In the balanced sample, the treatment (control) group contains firms (never) participating in the pilot program consecutively from 2011 to 2014
  - 150 pilot stocks in the treatment group
- In the unbalanced panel, the treatment group includes firms participating in the pilot program in any year after 2011
  - 189 firms in 2011
  - 193 firms in 2012
  - 411 firms in 2013
  - 478 firms in 2014
- Univariate DiD tests on the balanced sample and OLS regressions on the unbalanced sample





# Variables

CSMAR

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- Dependent variables: Capex (capital expenditures) and Capex+R&D (the sum of capital and R&D expenditures), standardized by previous-year total assets in percentage
- Explanatory variables
  - *MarginBuy*: total RMB remaining balance of margin buying
  - $\Delta$ *MarginBuy*: the net change in purchases on margin
  - Similar for short selling
- Control variables include market-to-book (M/B), cash flow, log(TA), profitability and financial leverage
- Instrumental variables (IV)
  - Ownership of leverage mutual funds for margin trading
  - IO, illiquidity, coverage, and turnover for short selling



# Summary Statistics

## Treatment vs. Control Firms

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Panel A and Panel B display the summary statistics of firm characteristics in the pilot group and control group of the balanced panel before the pilot program (2006-2009), and during the pilot program (20011-2014), where the pilot group consists of firms consecutively participating in the pilot program each year from 2011 to 2014. Panel C displays the summary statistics of the margin trading measures and firm characteristics of the pilot group of the unbalanced panel during the pilot program (2011-2014), where the pilot group consists of firms participating in the pilot program in certain years from 2011 to 2014.

Panel A. Firm characteristics of pilot and control groups before the pilot program (2006-2009)

	Pilot Group					Control Group				
	mean	std	P25	median	P75	mean	std	P25	median	P75
Capex	11.349	16.596	3.123	7.308	13.099	6.751	8.937	1.568	4.037	8.647
CapexR&D	11.736	16.619	3.195	7.915	14.377	6.873	8.967	1.634	4.182	8.853
Ln(TA)	8.826	1.169	8.087	8.723	9.372	7.462	0.964	6.828	7.417	8.020
M/B	1.540	2.259	0.259	0.765	1.965	1.006	1.386	0.197	0.537	1.301
Profitability	1.026	0.951	0.467	0.791	1.264	0.857	0.800	0.433	0.683	1.051
Leverage	0.514	0.186	0.396	0.512	0.648	0.503	0.703	0.372	0.517	0.629
Cash Flow	0.099	0.178	0.030	0.087	0.168	0.063	0.113	0.013	0.057	0.111



# Summary Statistics

## Treatment vs. Control Firms

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Panel B. Firm characteristics of pilot and control groups during the pilot program (2011-2014)

	Pilot Group					Control Group				
	mean	std	P25	median	P75	mean	std	P25	median	P75
Capex	11.776	21.429	3.339	7.464	13.429	6.871	28.445	1.439	3.676	7.486
CapexR&D	12.069	21.522	4.054	9.912	14.795	6.912	28.776	1.950	4.787	9.047
Ln(TA)	9.948	1.157	9.191	9.850	10.665	8.082	1.139	7.344	8.068	8.786
M/B	1.005	1.467	0.181	0.522	1.250	1.167	1.534	0.275	0.662	1.509
Profitability	0.884	0.733	0.406	0.729	1.071	1.123	6.453	0.427	0.696	1.071
Leverage	0.523	0.186	0.416	0.543	0.668	0.522	0.277	0.363	0.520	0.665
Cash Flow	0.065	0.093	0.015	0.061	0.115	0.064	0.667	-0.005	0.040	0.090

Panel C. Firm characteristics and margin trading of pilot group during the pilot program (unbalanced panel)

Variable	Mean	Std Dev	P25	Median	P75
Capex	11.912	15.788	3.972	6.823	13.113
CapexR&D	10.377	16.176	2.936	7.440	12.142
Ln(TA)	9.339	1.078	8.556	9.306	10.166
M/B	1.047	1.400	0.221	0.576	1.322
Profitability	1.083	2.421	0.444	0.743	1.124
Leverage	0.517	0.189	0.391	0.534	0.659
Cash Flow	0.072	0.175	0.010	0.053	0.113
<i>MarginBuy</i>	0.111	0.084	0.054	0.090	0.149
<i>ΔMarginBuy</i>	0.017	0.627	-0.104	0.031	0.069
<i>ShortSell</i>	0.078	0.107	0.009	0.032	0.103
<i>ΔShortSell</i>	0.002	0.398	-0.024	0.004	0.039



# Empirical Results

## Difference-in-Difference Tests of Capital and R&D Expenditures

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Panel A. Difference-in-difference test of Capex before and during the pilot program

Variable of interest	Pilot Group (PILOT=1)		Control Group (PILOT=0)		Test for difference
	obs	mean	obs	Mean	Mean t-stat
<b>Capex</b>					
Pre(06-09)	150	11.349	844	6.751	4.598 <sup>***</sup> (3.31)
During(11-14)	150	11.776 	844	6.871 	4.905 <sup>**</sup> (2.45)
During-Pre	150	0.427	844	0.120	0.307 <sup>***</sup> (2.80)

Panel B. Difference-in-difference test of CapexR&D before and during the pilot program

Variable of interest	Treatment Group (PILOT=1)		Control Group (PILOT=0)		Test for differences
	obs	Mean	obs	Mean	Mean t-stat
<b>CapexR&amp;D</b>					
Pre(06-09)	150	11.736	844	6.873	4.863 <sup>***</sup> (3.49)
During(11-14)	150	12.069 	844	6.912 	5.157 <sup>**</sup> (2.56)
During-Pre	150	0.333	844	0.039	0.294 <sup>***</sup> (2.59)



# Empirical Results

## Difference-in-Difference Regressions of Capital and R&D Expenditures

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Dependent Variable	(1) Capex	(2) Capex	(3) CapexR&D	(4) CapexR&D
PILOT*During	1.69** (2.00)	1.50** (2.11)	1.94** (2.32)	1.64** (2.03)
PILOT	4.29*** (4.13)	1.28*** (2.78)	4.50*** (4.40)	1.38*** (3.17)
During	-1.37*** (-4.40)	2.46*** (2.81)	0.00 (0.01)	-1.12 (-1.43)
Ln(TA)		-3.76** (-2.18)		-0.75 (-1.15)
M/B		1.85*** (2.58)		1.97*** (2.77)
Profitability		-0.48 (-0.52)		-0.68 (-0.77)
Leverage		-3.94* (-1.73)		-3.47 (-1.52)
Cash Flow		35.22*** (4.52)		36.59*** (4.72)
Industry effects	YES	YES	YES	YES
obs	7952	7952	7952	7952
adj. R <sup>2</sup>	0.023	0.172	0.022	0.154



# Empirical Results

## Effects of Margin Trading on Capital and R&D Expenditures

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Dependent Variable	(1) Capex	(2) Capex	(3) CapexR&D	(4) CapexR&D
<i>MarginBuy</i>	4.02** (2.13)		4.54** (2.10)	
$\Delta$ <i>MarginBuy</i>		4.37** (2.16)		4.84** (2.12)
Ln(TA)	-0.13 (-0.59)	4.19** (-2.01)		
M/B	0.27 (0.90)	0.24 (0.81)		
Profitability	0.99*** (3.72)	0.93** (3.46)		
Leverage	3.12 (1.09)	3.00 (1.01)		
Cash Flow	23.76*** (4.99)	23.79*** (4.96)	(2.40)	(2.40)
Industry and Year fixed effects	YES	YES	YES	YES
obs	1271	1271	1271	1271
adj. $R^2$	0.269	0.366	0.215	0.215

We also tried to include measures for short-selling trading and the results remain qualitatively and quantitatively similar (Appendix B)



# 2SLS Regressions

## Ownership of Leveraged Mutual Funds as an Instrument

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- We use the fraction of leveraged mutual fund ownership in a firm as an instrument for margin trading
  - Leveraged mutual funds are not related to active control of the managers of a firm, since mutual funds are typically passive investors neither related to activism nor related to information
  - Investors can purchase leveraged mutual funds to meet their sole leverage needs

1st Stage:

$$\text{Margin\_buy}_{i,t} = \alpha_1 + \beta_1 \text{Mutual\_fund}_{i,t} + \gamma_1 X_{i,t} + \epsilon_{i,t}$$

2nd Stage:

$$\text{CapEx}_{i,t} = \alpha_2 + \beta_2 \widehat{\text{Margin\_buy}}_{i,t} + \gamma_2 X_{i,t} + e_{i,t}$$



# 2SLS Regressions

## Ownership of Leverage Mutual Funds as an Instrument

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Dependent Variable	1 <sup>st</sup> stage <i>MarginBuy</i>	2 <sup>nd</sup> stage Capex	1 <sup>st</sup> stage <i>ΔMarginBuy</i>	2 <sup>nd</sup> stage Capex
Mutual_fund	0.0052* (1.69)		0.0518*** (5.55)	
<i>MarginBuy</i>		5.34** (2.42)		
<i>ΔMarginBuy</i>				7.84** (2.53)
Ln(TA)	0.0003 (0.12)	-6.14*** (-6.88)	0.1385*** (6.62)	-18.27 (-0.75)
M/B	0.0006 (0.26)	0.60** (2.17)	0.0596** (2.30)	1.51 (0.67)
Profitability	-0.0123*** (-4.65)	0.68 (1.30)	-0.0152 (-0.81)	2.15 (0.66)
Leverage	0.0018 (0.15)	-7.61*** (-2.94)	-0.3138*** (-3.82)	0.52 (0.03)
Cash Flow	-0.0085 (-0.57)	1.97 (0.78)	0.2328* (1.66)	-15.05 (-0.43)
Industry and Year fixed effects	YES	YES	YES	YES
Obs	1271	1271	1271	1271
<i>adj. R2</i>	0.335	0.017	0.202	0.018





# 2SLS Regressions

## Ownership of Leverage Mutual Funds as an Instrument

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Dependent Variable	1 <sup>st</sup> stage <i>MarginBuy</i>	2 <sup>nd</sup> stage CapexR&D	1 <sup>st</sup> stage $\Delta$ <i>MarginBuy</i>	2 <sup>nd</sup> stage CapexR&D
Mutual_fund	0.0052 <sup>*</sup> (1.69)		0.0518 <sup>***</sup> (5.55)	
<i>MarginBuy</i>		7.78 <sup>**</sup> (2.10)		
$\Delta$ <i>MarginBuy</i>				8.58 <sup>**</sup> (2.52)
Ln(TA)	0.0003 (0.12)	-8.42 <sup>***</sup> (-5.02)	0.1385 <sup>***</sup> (6.62)	-1.87 <sup>**</sup> (-2.42)
M/B	0.0006 (0.26)	0.95 <sup>*</sup> (1.83)	0.0596 <sup>**</sup> (2.30)	0.37 (0.82)
Profitability	-0.0123 <sup>***</sup> (-4.65)	0.26 (0.27)	-0.0152 (-0.81)	5.31 <sup>***</sup> (7.96)
Leverage	0.0018 (0.15)	-15.04 <sup>***</sup> (-3.09)	-0.3138 <sup>***</sup> (-3.82)	-6.67 <sup>*</sup> (-1.67)
Cash Flow	-0.0085 (-0.57)	3.82 (0.80)	0.2328 <sup>*</sup> (1.66)	53.46 <sup>***</sup> (9.80)
Industry and Year fixed effects	YES	YES	YES	YES
Obs	1271	1271	1271	1271
<i>adj. R</i> <sup>2</sup>	0.335	0.034	0.202	0.128



# Three Underlying Channels

## 1. Stock Price Informativeness

- The first channel: the change in the informativeness of stock prices
- Explanatory variables
  - After the margin trading ban was lifted in 2010, there is an increase in price efficiency and a decrease in stock return volatility
  - Chang et al. (2014), Wang & Wei (2017)
- The pilot program enhances the liquidity and the information efficiency of stock prices, leading to more efficient capital allocation, by providing more relevant information to managers that guide their investment decisions

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# Three Underlying Channels

## 2. Financing Costs

- Hubbard (1998) suggests that investments of financially constrained firms are less responsive to investment opportunities because external financing is costly
- Rajan and Zingales (1998) find that industry sectors with higher external financing needs grow faster in countries with more developed financial markets
- Thus, the benefit of a reduction in external financing costs could be greater for financially constrained firms
- If the pilot program improves capital allocation efficiency by reducing external financing costs and relaxing external financial constraints, we expect that the effect is more pronounced for firms that have a higher degree of financial constraints

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# Empirical Results

## Sample Partitioned by Financial Constraints

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Dependent Variable	Low Financial Constraints				High Financial Constraints			
	(1) Capex	(2) Capex	(3) CapexR&D	(4) CapexR&D	(5) Capex	(6) Capex	(7) CapexR&D	(8) CapexR&D
<i>MarginBuy</i>	2.51 <sup>*</sup> (1.67)		3.31 <sup>*</sup> (1.86)		5.64 <sup>***</sup> (2.78)		7.61 <sup>***</sup> (3.32)	
$\Delta$ <i>MarginBuy</i>		3.38 <sup>**</sup> (2.07)		3.05 <sup>*</sup> (1.65)		6.46 <sup>***</sup> (2.93)		6.16 <sup>***</sup> (2.67)
Ln(TA)	0.12 (0.38)	0.07 (0.22)	-3.01 (-1.17)	0.15 (0.49)	-0.03 (-0.14)	0.05 (0.22)	-7.53 <sup>***</sup> (-3.65)	0.14 (0.33)
M/B	1.16 <sup>***</sup> (3.06)	1.18 <sup>***</sup> (3.22)	-0.22 (-0.51)	-0.90 <sup>**</sup> (-2.56)	0.27 (1.08)	0.23 <sup>*</sup> (1.90)	0.29 (0.57)	0.20 (0.74)
Profitability	1.18 <sup>***</sup> (2.88)	1.19 <sup>***</sup> (2.74)	0.36 (0.85)	2.04 <sup>***</sup> (3.13)	1.28 <sup>**</sup> (1.97)	1.22 <sup>*</sup> (1.88)	0.98 (0.80)	1.13 (0.98)
Leverage	-1.54 (-0.66)	-1.45 (-0.63)	-10.18 <sup>**</sup> (-2.49)	-1.33 (-0.34)	6.00 <sup>**</sup> (2.09)	5.89 <sup>**</sup> (1.96)	8.39 (1.01)	5.59 <sup>*</sup> (1.93)
Cash Flow	22.40 <sup>***</sup> (4.73)	22.38 <sup>***</sup> (4.76)	5.19 <sup>***</sup> (4.25)	19.99 <sup>***</sup> (4.63)	24.64 <sup>***</sup> (5.06)	24.73 <sup>***</sup> (5.05)	9.33 <sup>**</sup> (2.22)	31.30 <sup>***</sup> (8.03)
Industry and Year fixed effects	YES	YES						YES
Obs	584	584						687
adj. R <sup>2</sup>	0.375	0.21						0.307

More significant effects for firms with high financial constraints using Kaplan & Zingales (1997)



# Empirical Results

## Sample Partitioned by Financial Constraints

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Dependent Variable	low financial constraints				high financial constraints			
	(3) Capex	(4) Capex	(1) CapexR&D	(2) CapexR&D	(7) Capex	(8) Capex	(5) CapexR&D	(6) CapexR&D
<i>MarginBuy</i>	3.01 <sup>*</sup> (1.66)		1.71 <sup>*</sup> (1.82)		5.64 <sup>***</sup> (2.89)		9.59 <sup>***</sup> (2.99)	
$\Delta$ <i>MarginBuy</i>		3.14 <sup>*</sup> (1.87)		1.88 <sup>*</sup> (1.90)		5.25 <sup>***</sup> (2.82)		9.51 <sup>***</sup> (2.94)
Ln(TA)	-0.02 (-0.06)	-0.03 (-0.11)	-4.89 <sup>*</sup> (-2.10)	-0.15 (-0.58)	-0.14 (-0.47)	-0.27 (-0.85)	-3.85 <sup>***</sup> (-5.08)	-1.27 <sup>*</sup> (-2.04)
M/B	0.96 <sup>***</sup> (3.10)	0.98 <sup>***</sup> (3.22)	0.39 (1.13)	0.07 (0.25)	0.18 (0.70)	0.11 (0.43)	0.44 (0.83)	0.10 (0.50)
Profitability	1.66 <sup>***</sup> (3.26)	1.63 <sup>***</sup> (3.18)	0.88 (1.38)	1.45 <sup>***</sup> (5.37)	0.63 (0.61)	0.58 (0.57)	0.85 (0.08)	0.89 (1.13)
Leverage	-0.56 (-0.20)	-0.56 (-0.20)	-8.23 (-1.29)	-3.11 (-0.74)	-5.86 <sup>**</sup> (-2.33)	-5.63 <sup>*</sup> (-2.12)	-12.99 (-0.74)	-1.32 (-0.85)
Cash Flow	18.73 <sup>***</sup> (4.03)	18.65 <sup>***</sup> (4.03)	5.67 <sup>**</sup> (2.19)	28.48 <sup>***</sup> (6.11)	28.64 <sup>***</sup> (7.24)	28.83 <sup>***</sup> (7.36)	5.59 (0.55)	4.19 <sup>**</sup> (2.58)
Industry and Year fixed effects	YES	YES						YES
Obs	656	656						615
adj. $R^2$	0.264	0.264						0.231

More significant effects for firms with high financial constraints using Whited & Wu (2006)



# Three Underlying Channels

## 3. Cost of Debt

- A more informative equity price and a higher level of equity price can be associated with a lower cost of debt (Sunder 2004)
- Thus, a more efficient market price of equity helps reduce the cost of raising external debt capital
- If this is the case that those firms that are included in the pilot program can raise new debt capital more easily, the managers of pilot firms will be more likely to invest in capital and R&D expenditures

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## Effects on Corporate Financing

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	(1) <i>DEBT</i>	(2) <i>EQUITY</i>
PILOT	8.46 <sup>***</sup>	14.97
	(2.96)	(0.94)
Ln(TA)	-5.58 <sup>***</sup>	-19.52
	(-3.90)	(-1.38)
M/B	1.95 <sup>*</sup>	0.16
	(1.95)	(0.02)
Profitability	0.59	7.33 <sup>*</sup>
	(0.35)	(1.82)
Leverage	6.49	66.54 <sup>*</sup>
	(1.06)	(2.03)
Cash Flow	16.04	111.82
	(1.24)	(1.29)
Industry and Year fixed effects	YES	YES
obs	4685	4685
<i>adj. R</i> <sup>2</sup>	0.008	0.021

↑ debt issues

X

There are still many restrictions on equity financing and debt remains the primary instrument for raising capital in China



# Empirical Results

## Effects on Investment-Q Sensitivity

Margin and Investments

Nathan Dong  
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	(1) Capex	(2) CapexR&D
PILOT	3.72 <sup>***</sup>	1.43 <sup>***</sup>
	(3.26)	(2.73)
M/B	3.17 <sup>***</sup>	0.18 <sup>*</sup>
	(3.11)	(1.78)
M/B* PILOT	2.49 <sup>***</sup>	2.07 <sup>**</sup>
	(2.84)	(2.46)
Ln(TA)	-0.74	
	(-0.98)	
Profitability	0.51	
	(0.43)	
Leverage	2.12 <sup>*</sup>	
	(1.99)	
Cash Flow	47.84 <sup>***</sup>	
	(3.42)	
Industry and Year fixed effects	YES	
obs	4685	
adj. R <sup>2</sup>	0.056	0.202

Investment becomes more sensitive to Q hence investment efficiency is improved (Chen et al. 2007; Foucault & Frésard 2012)





# Conclusion

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- We identify the exogenous policy shock using the recent removal of margin trading bans in China, which affects the real economy by reducing firms' financing constraints and costs of capital
- We show the positive association between margin trading and corporate investments, and the magnitude of the effect is greater among firms that have a higher degree of financing constraints
- This study suggests the direction of growth-oriented reform policies in China: relaxing external financing constraints to allow capital to flow to the best investment opportunities