# Stock market listing, investment and business groups: How firm structure impacts investment?

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# Outline of today's presentation

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- Motivation
- Institutional Background
- Hypotheses
- Empirical Analysis
  - Data
  - Research Design
- Results
- Conclusion

# Motivation



- Does “being listed” impact investment behavior?
  - Effects of listing status:
    - Secondary market induces pressures on managers
  - Managers tend to be short-sighted?
    - Short termism (Stein, 1989)
    - Under-investment by US firms
    - Asker et al. (2015, RFS)

# Motivation


As a public company, ***we are subject to wild swings in our stock price that can be a major distraction for everyone working at Tesla***, all of whom are shareholders.

Being public also subjects us to ***the quarterly earnings cycle that puts enormous pressure on Tesla to make decisions that may be right for a given quarter, but not necessarily right for the long-term***.

Finally, as the most ***shorted stock*** in the history of the stock market, ***being public means that there are large numbers of people who have the incentive to attack the company***.

# Motivation



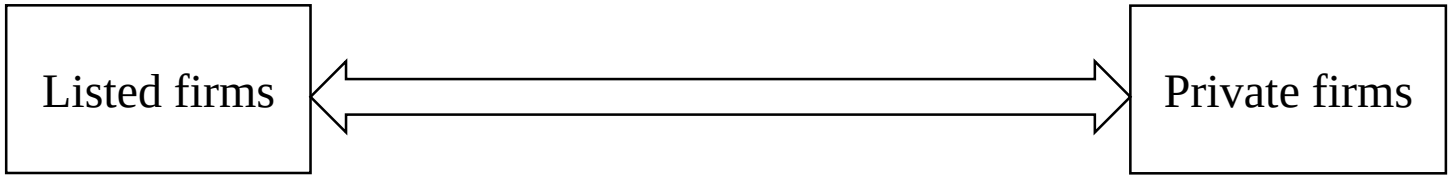
- Listing provides capital resource and monitoring system
  - ‘Voice and exit’: Market price is a good monitoring system
  - Liquidity decreases cost of equity
  - Gilje and Taillard (2016, JF); Acharya and Xu (2017, JFE)

- Does firms structure impact the costs and benefits of listing?
  - Business group firms vs. Standalone firms
  - Effects of the number of subsidiaries

# Institutional background



- Limitation on *simple* comparison between listed firms and private firms
  - Listed firms need to follow more strict disclosure regulation



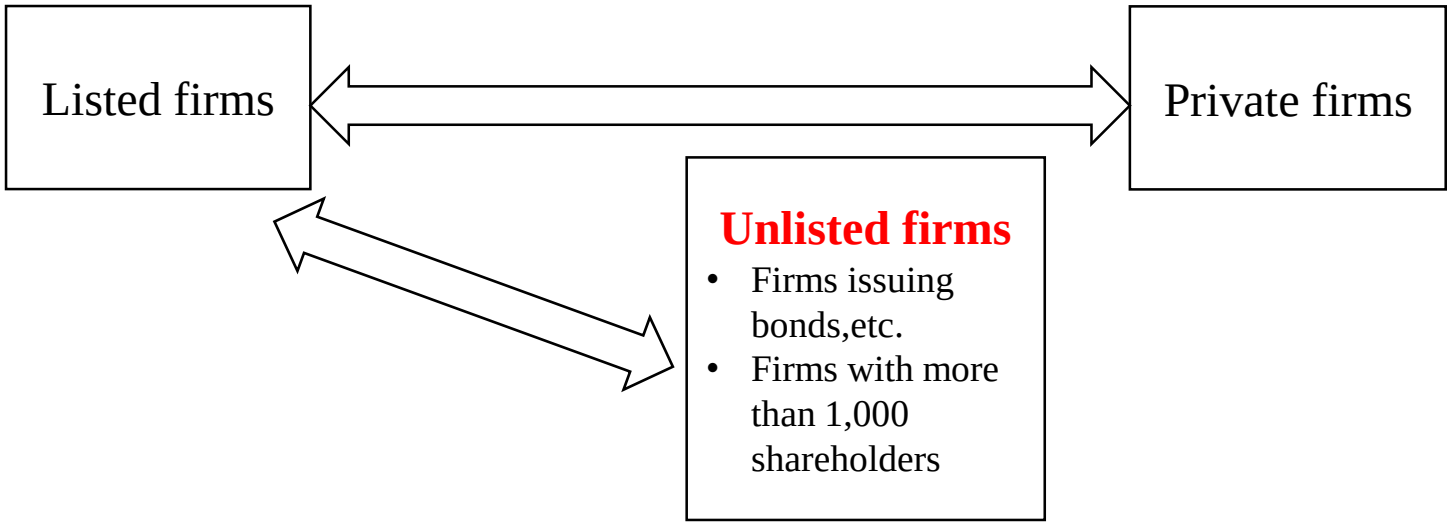

- Listing status
- Disclosure regulation (Reg FD; Security Law)
- Ownership concentration…etc.

  - We need to control for these differences as well as listing status

# Institutional background

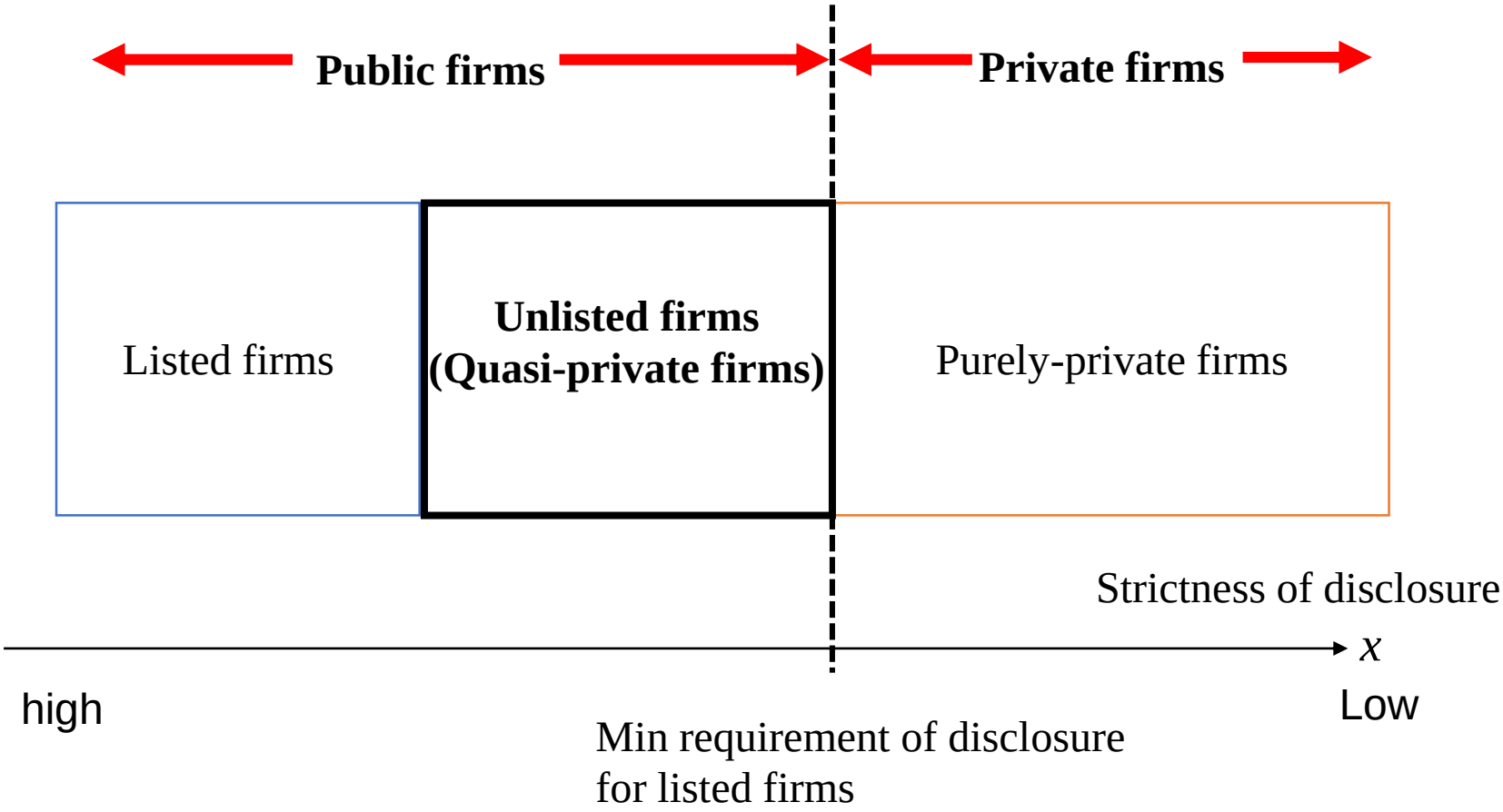


- Using Japanese unlisted firms as quasi-private counterparts




  - Quasi-private firms are required to report financial sattements
    - Same regulatory requirement
    - Ownership concentration is similar to listed firms

# Institutional background



# Why Japan?



- Japanese firms were long-term oriented
  - Comparing with US firms, Japanese firms tended to have long-term windows in 70's and 80's (Abegglen, 1985)
  - "Lost decades" after the bubble-crash in 90's…
    - Capex declines
    - Poor corporate performance
      - Avg. ROE: 7-8% (US: 14-15%)
      - Avg. Market-to-Book: 0.9-1.4 (US: 3.0-3.5)
- Short-termism in Japanese firms?
  - Some scholars point out short-termism of Japanese firms
  - Stock market induce short-term pressures on managers

# Hypotheses



- Cost-benefit of being listed in secondary market
  - (Costs) Short-termism
    - Short-term pressure depresses corporate investment activities
    - Asker et al. (2015, RFS)
  - (Benefits) Finance flexibility
    - Flexible financial resources allow firms to invest efficiency
    - Gilje and Taillard (2016, JF); Acharya and Xu (2017, JFE)

H1: Listed firms invest *more* than unlisted firms

# Hypotheses



- 'Quiet Life' hypothesis by Hicks (1937) and Bertrand and Mullainathan (2003)
  - Managers who are protected from pressures from shareholders or takeovers tend to invest less than managers who are subject to threats of takeover or market monitoring
  - Parents of group firms are more difficult to acquire than standalone firms
  - Unlisted standalone firms do not face these pressures
- Internal capital markets can alleviate financial constraints
  - Listed standalone firms can resolve financial constraints

H2: The impact of listing status on investment is more important for standalone firms compared to business group firms.

# Prior Studies



- Asker et al. (2015)
  - Compare listed firms with purely-private firms
  - Listed firms invest less than private firms
  - Listed firms invest less efficiently than private firms
- Orihara (2014)
  - Listed firms invest less than private firms in Japan
- Bakke, Jens, and Whited (2012)
  - Stock market listing increases investment
- Giljie and Taillard (2012)
  - Private firms are less responsive to investment opportunities than public firms
- Acharya and Xu (2017)
  - Compare listed firms with quasi-private firms
  - Listed firms invest more in innovation than private firms

# Sample construction



- Japanese listed and unlisted firms from Nikkei NEEDS Financial-Quest
  - From FY2000/March through FY2017/February
  - Excluding government managed firms (government shareholding >50% of common stock)
  - Excluding financial firms
  - Excluding IPO firms
  - All the variables are winsorized at 1% levels

# Empirical specifications



- Baseline model:

$$investment_{it} = \alpha_1 \, listed_{it} + \Gamma \boldsymbol{z} + \boldsymbol{fe} + \varepsilon_{it}$$

| *variables* | *definition* |
|---|---|
| *investment* | Several investment measures:<br>*Δppe*; PPE/(tangible and intangible assets), *capex*; Capital expenditure/(tangible and intangible assets), *capex+rd*, *tan+ int*; from cash flow statement |
| *listed* | Indicator variable taking 1if firm is listed, 0 otherwise. |
| ***z*** | Control variables<br>*Fundamentals*: *predicted q, roa, size, cash, leverage*<br>*Ownership structure*: *financial institutions, foreign shareholders, directors, top 10* |
| ***fe*** | *Industry* and *year* fixed effects |

# Descriptive statistics: Table 1

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| | Listed Firms (n=39,946) | | | Unlisted Firms (n=2,183) | | | Listed - Unlisted | |
|---|---|---|---|---|---|---|---|---|
| | mean | median | sd | mean | p50 | sd | mean | median |
| *Δppe* | 0.1447 | 0.0922 | 0.2198 | 0.0851 | 0.0417 | 0.1800 | 0.0597*** | 0.0505*** |
| *capex* | 0.1508 | 0.0947 | 0.1968 | 0.0786 | 0.0345 | 0.1398 | 0.0722*** | 0.0603*** |
| *tan+int* | 0.1625 | 0.0994 | 0.2246 | 0.0975 | 0.0466 | 0.1853 | 0.0650*** | 0.0528*** |
| *capex+rd* | 0.2244 | 0.1365 | 0.3315 | 0.1151 | 0.0406 | 0.2729 | 0.1093*** | 0.0960*** |
| *pred_q* | 1.0867 | 0.9816 | 0.4670 | 1.0310 | 0.9409 | 0.3700 | 0.0556*** | 0.0408*** |
| *roa* | 0.4668 | 0.2363 | 1.1183 | 0.1947 | 0.1074 | 0.7109 | 0.2721*** | 0.1289*** |
| *age* | 3.8043 | 3.9890 | 0.5951 | 3.9570 | 4.0775 | 0.5441 | -0.1527*** | -0.0886*** |
| *size* | 10.3786 | 10.2507 | 1.5213 | 9.5776 | 9.7393 | 1.6732 | 0.8010*** | 0.5114*** |
| *cash* | 1.6230 | 0.4987 | 4.1899 | 0.9392 | 0.2472 | 3.2736 | 0.6838*** | 0.2515*** |
| *lev* | 0.2115 | 0.1773 | 0.1857 | 0.2893 | 0.2757 | 0.2409 | -0.0778*** | -0.0983*** |
| *sh_financial* | 0.1861 | 0.1627 | 0.1307 | 0.0740 | 0.0451 | 0.0873 | 0.1121*** | 0.1176*** |
| *sh_foreign* | 0.0766 | 0.0305 | 0.1028 | 0.0116 | 0 | 0.0620 | 0.0650*** | 0.0305*** |
| *sh_top10* | 0.5081 | 0.5010 | 0.1606 | 0.4574 | 0.4869 | 0.2837 | 0.0507*** | 0.0142*** |
| *sh_directors* | 0.0975 | 0.0310 | 0.1363 | 0.0648 | 0.0134 | 0.1120 | 0.0327*** | 0.0177*** |

# Empirical results: Table 3



$$investment_{it} = \alpha_1 \, listed_{it} + \Gamma \mathbf{z} + \mathbf{fe} + \varepsilon_{it}$$

| | *Δppe* (1) | *capex* (2) | *tan+int* (3) | *capex+rd* (4) |
|---|---|---|---|---|
| *listed* | 0.0217*** | 0.0359*** | 0.0254*** | 0.0244* |
| | (3.33) | (5.54) | (3.56) | (1.94) |
| Observations | 42,129 | 42,129 | 42,129 | 42,129 |
| industry/year | yes | yes | yes | yes |
| clustered by | firm | firm | firm | firm |
| Adj. $R^2$ | 0.190 | 0.193 | 0.294 | 0.341 |

**H1:** *Listed firms engage in more investment than unlisted firms.*

- The role of listing in alleviating financial constraints is more important than potential underinvestment due to myopic managerial behavior.
- This result is in contrast to Orihara (2014) who confirms the same qualitative results of Asker et al. (2015) in Japanese counterparts.

# Empirical results: Table 4

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(Sub-sample test) $investment_{it} = \alpha_1 \, listed_{it} + \Gamma \mathbf{z} + \mathbf{fe} + \varepsilon_{it}$

| | Business Group | | | | Standalone | | | |
|---|---|---|---|---|---|---|---|---|
| | *Δppe* | *capex* | *tan+int* | *capex+rd* | *Δppe* | *capex* | *tan+int* | *capex+rd* |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *listed* | -0.0037 | 0.0023 | -0.0061 | -0.0027 | 0.0361** | 0.0980*** | 0.0870*** | 0.0789** |
| | (-0.55) | (0.38) | (-0.89) | (-0.23) | (2.32) | (5.85) | (4.47) | (2.50) |
| Observations | 35,819 | 35,819 | 35,819 | 35,819 | 6,310 | 6,310 | 6,310 | 6,310 |
| Year fixed effects | | | | | | | | |
| Industry fixed effects | | | | | | | | |
| clustered by | | | | | | | | |
| Adj. $R^2$ | 0.204 | 0.189 | 0.300 | 0.307 | 0.188 | 0.230 | 0.302 | 0.439 |

**H2:** *The impact of listing status on investment behavior is more important for standalone firms relative to business group firms.*

# Empirical results: Table 5

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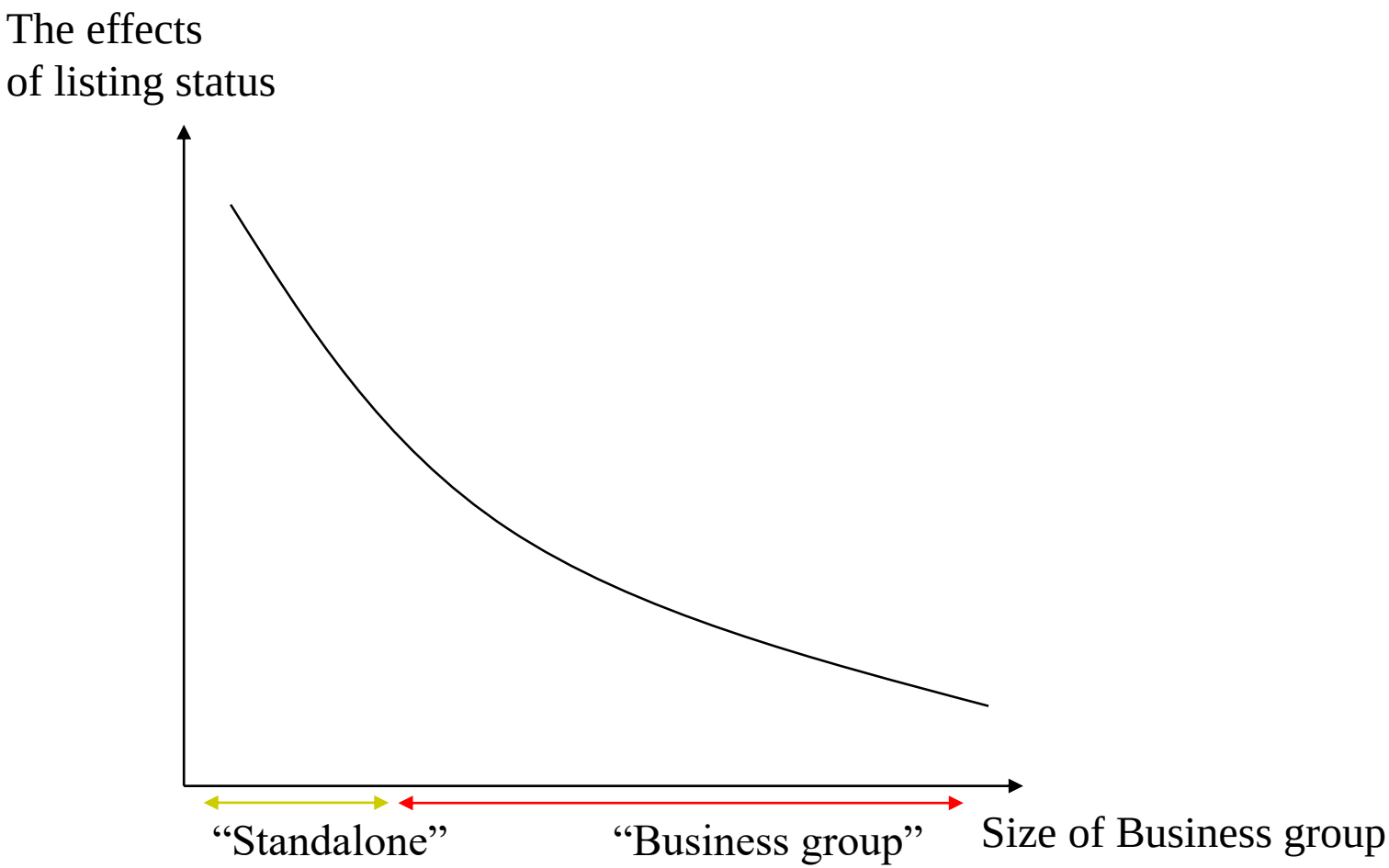
$$investment_{it} = \beta_1\, listed_{it} + \beta_2\, ln\_subs_{it} + \beta_3\, listed_{it} \times ln\_subs_{it} + \Gamma \mathbf{z} + \mathbf{fe} + \varepsilon_{it}$$

| | Business Group | | | |
|---|---|---|---|---|
| | *Δppe* | *capex* | *tan+int* | *capex+rd* |
| | (1) | (2) | (3) | (4) |
| *listed* | 0.0379** | 0.0422*** | 0.0289* | 0.0537* |
| | (2.23) | (2.84) | (1.70) | (1.92) |
| *listed ×ln_subs* | -0.0194*** | -0.0187*** | -0.0161** | -0.0263** |
| | (-2.59) | (-2.75) | (-2.27) | (-2.09) |
| *ln_subs* | 0.0269*** | 0.0246*** | 0.0298*** | 0.0366*** |
| | (3.56) | (3.51) | (4.14) | (2.79) |
| Observations | | | | |
| industry/year | | | | |
| clustered by | | | | |
| Adj. $R^2$ | | | | |

- As business groups get larger, management becomes more sheltered from market discipline and investment declines consistent with the enjoying the quiet life hypothesis.
- Unlisted business groups invest more as the number of subsidiaries increases.

# Summary of results



# Robustness check



- Selection bias on a choice of listing status
  - Listing is an important corporate decision
    - This endogeneity might drive our results
  - (Observable variables) Matching procedures
  - (Unobservable variables) Heckman's treatment effect model
    - Acharya and Xu (2017, JFE)

# Table 6: PS Matching Reults

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| | Matching | | | Matching +TEM | | | Matching +Subsample | | |
|---|---|---|---|---|---|---|---|---|---|
| Matching? | *year +industry +size* | *year +industry +size +lev +cash +sg* | *year +industry +Business Group +size* | *year +industry +size* | *year +industry +size +lev +cash +sg* | *year +industry +Business Group +size* | Standalone | *year +industry +Business Group +size* Business Group | *year +industry +Business Group +size* Business Group |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| *listed* | 0.0657*** | 0.0298*** | 0.0448*** | 0.0573*** | 0.0247*** | 0.0359*** | 0.1486*** | 0.0158* | 0.0709*** |
| | (6.01) | (3.40) | (5.06) | (5.26) | (2.87) | (4.03) | (4.82) | (1.87) | (3.80) |
| *listed ×ln_subs* | | | | | | | | | -0.0284*** |
| | | | | | | | | | (-3.34) |
| *ln_subs* | | | | | | | | | 0.0143* |
| *Mills ratio* | | | | 0.2340*** | 0.1863*** | 0.3302*** | | | |
| ***control*** | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Observations | 4,252 | 3,435 | 3,570 | 4,252 | 3,435 | 3,570 | 755 | 2,815 | 2,815 |
| Year fixed effects | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Industry fixed effects | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| clustered by | firm | firm | firm | firm | firm | firm | firm | firm | firm |
| Adj. $R^2$ | 0.218 | 0.179 | 0.178 | 0.221 | 0.181 | 0.184 | 0.247 | 0.141 | 0.146 |

# Extensions: Investment sensitivity



- Do listed standalone firms invest efficiently?
  - Standalone listed firms invest more than unlisted counterparts
  - The results might not suggest that they invest efficiently
    - Alternative explanation is that they overinvest because of agency problems

To check the efficiency of listed standalone firms investment …

# Table 7 Panel A: Investment Sensitivity



$$investment_{it} = \beta_1\, listed_{it} + \beta_2\, listed_{it} \times pred\_q_{it} + \beta_3\, pred\_q_{it} + \Gamma \mathbf{z} + \mathbf{fe} + \varepsilon_{it}$$

| | Standalone | | | |
|---|---|---|---|---|
| | *Δppe* | *capex* | *tan+int* | *capex+rd* |
| | (1) | (2) | (3) | (4) |
| *listed* | -0.0525* | 0.0126 | -0.0509 | 0.0805 |
| | (-1.88) | (0.46) | (-1.24) | (1.35) |
| *listed ×pred_q* | 0.0827*** | 0.0788*** | 0.1355*** | 0.0183 |
| | (4.02) | (3.30) | (4.02) | (0.34) |
| *listed ×roa* | -0.0172 | -0.0125 | -0.0603* | -0.0974* |
| | (-0.97) | (-0.67) | (-1.95) | (-1.92) |
| Observations | 6,310 | 6,310 | 6,310 | 6,310 |
| industry/year | | | | |
| clustered by | | | | |
| Adj. $R^2$ | | | | |

- Listed standalone firms are more sensitive to changes in investment opportunities.
- Listed firms' investment is less sensitive to ROA than unlisted standalone firms, suggesting that unlisted standalone firms face financing constraints.

# Extensions: Financial constraints



- Listing status may alleviate financial constraints by…
  - Providing flexible capital resources
  - Decreasing the cost of capital

- Running the baseline regression for financial constrained and unconstrained sub-samples
  - No payout firms
  - No bond access firms
  - Small firms
  - Hadlock and Pierce index

# Table A4: Listing status and financial constraints



$$investment_{it} = \alpha_1 \, listed_{it} + \Gamma \mathbf{z} + \mathbf{fe} + \varepsilon_{it}$$

| | Payout | Bond Access | Size | HP |
|---|---|---|---|---|
| Constrained | 0.1065*** | 0.0509*** | 0.1025*** | 0.1344*** |
| | (6.82) | (6.62) | (6.05) | (4.59) |
| Unconstrained | 0.0064 | -0.0108 | -0.0072 | 0.0081 |
| *Difference* | *0.1001**** | *0.0617**** | *0.1097**** | *0.1263**** |
| *Chow test* | *1114.55* | *397.57* | *5008.37* | *56.89* |

- More financially constrained listed firms tend to be more sensitive to investment opportunities.

# Table 7 Panel B: Financial constraints

| | Standalone | | | |
|---|---|---|---|---|
| | *capex* | | | |
| | (1) | (2) | (3) | (4) |
| *listed* | 0.0666*** | 0.0576* | 0.0605*** | 0.0750*** |
| | (3.58) | (1.85) | (3.75) | (5.30) |
| *listed ×no_payout* | 0.0568** | | | |
| | (2.46) | | | |
| *no_payout* | -0.0370** | | | |
| | (-2.19) | | | |
| *listed ×no_bond* | | 0.0402 | | |
| | | (1.15) | | |
| *no_bond* | | -0.0618* | | |
| | | (-1.91) | | |
| *listed ×small* | | | 0.0490** | |
| | | | (2.12) | |
| *small* | | | -0.0586** | |
| | | | (-2.35) | |
| *listed ×hp* | | | | 0.1142*** |
| | | | | (2.61) |
| *hp* | | | | -0.0463 |
| | | | | (-1.07) |
| Observations | 6,310 | 6,310 | 6,310 | 6,310 |
| Year fixed effects | yes | yes | yes | yes |
| Industry fixed effects | yes | yes | yes | yes |
| clustered by | firm | firm | firm | firm |
| Adj. $R^2$ | 0.231 | 0.232 | 0.231 | 0.237 |

# Table 8: Effects of ownership structure



- Does ownership structure affect investment?

$$investment_{it} = b1\ listed_{it} + b2\ listed_{it} \times own_{it} + b3\ own_{it} + \Gamma \boldsymbol{z} + \boldsymbol{fe} + \varepsilon_{it}$$

| | *capex* | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| *listed* | 0.0609*** | 0.0338*** | 0.0582*** | 0.0335*** | 0.0780*** |
| | (6.64) | (5.10) | (4.75) | (4.50) | (6.16) |
| *listed ×sh_financial* | -0.3123*** | | | | -0.2802*** |
| | (-5.03) | | | | (-4.21) |
| *listed ×sh_foreign* | | 0.1577*** | | | 0.1605** |
| | | (2.81) | | | (2.54) |
| *listed ×sh_top10* | | | -0.0462** | | -0.0530** |
| | | | (-2.03) | | (-1.99) |
| *listed ×sh_directors* | | | | 0.0346 | 0.0536 |
| | | | | (0.68) | (0.91) |
| *sh_financial* | 0.4317*** | 0.1272*** | 0.1253*** | 0.1283*** | 0.3975*** |
| | (6.95) | (8.16) | (8.06) | (8.22) | (5.98) |
| *sh_foreign* | 0.0983*** | -0.0617 | 0.0927*** | 0.0922*** | -0.0577 |
| | (5.13) | (-1.13) | (4.86) | (4.84) | (-0.93) |
| *sh_top10* | 0.0008 | 0.0058 | 0.0426** | 0.0051 | 0.0463* |
| | (0.08) | (0.59) | (2.12) | (0.51) | (1.92) |
| *sh_directors* | 0.0551*** | 0.0547*** | 0.0570*** | 0.0225 | 0.0048 |
| | (3.07) | (3.05) | (3.18) | (0.46) | (0.09) |
| Observations | | | | | |
| industry/year clustered by AdRs | | | | | |

- Foreign ownership intensify the market pressure of being listed while financial institutions or large stable ownership tends to protect management from the discipline of financial markets allowing them to enjoy a quieter life.

# Table 9: Liquidity



- More liquid equity markets support better governance (Maug, 1988)
  - *liquidity*: minus (-) value of Amihud's (2002) illiquidity measure
  - The coefficients of liquidity variable exits only for listed firms

| | *capex* | | |
|---|---|---|---|
| | All Firms | Business Group | Standalone |
| | (1) | (2) | (3) |
| *liquidity* | 2.0812*** | 2.9338*** | 0.0715 |
| | (2.87) | (3.40) | (0.04) |
| Observations | 37,128 | 31,679 | 5,449 |
| Year fixed effects | | | |
| Industry fixed effects | | | |
| clustered by | | | |
| Adj. $R^2$ | 0.447 | 0.451 | 0.499 |

- Stock liquidity encourages more efficient investment by increasing the market monitoring of management, which helps to overcome managerial shirking

# Conclusion



- Listed firms invest more than unlisted firms
  - Positive effects are mainly driven by standalone firms
  - Listed standalone firms investment is more sensitive to investment opportunities
  - Listing more positively impacts investment when a firm faces financial constraints
  - Positive relationship between liquidity and investment
- These findings are consistent with the view that listing alleviates financial constraints
- Future work: No identification between short-termism and ‘quiet life’ story

***Thank you!***