

# Do Private Firms Invest Differently than Public Firms?

**Taking Cues from the Natural Gas Industry**

Liwei Shi

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3. Shortcomings and Further improvements
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# Data

- Schlumberger Corporation's Smith International Rig Count
- Lexis Nexis and Internet searches

# Findings and Tests

Key theme

➔ How listing status affects investment behavior

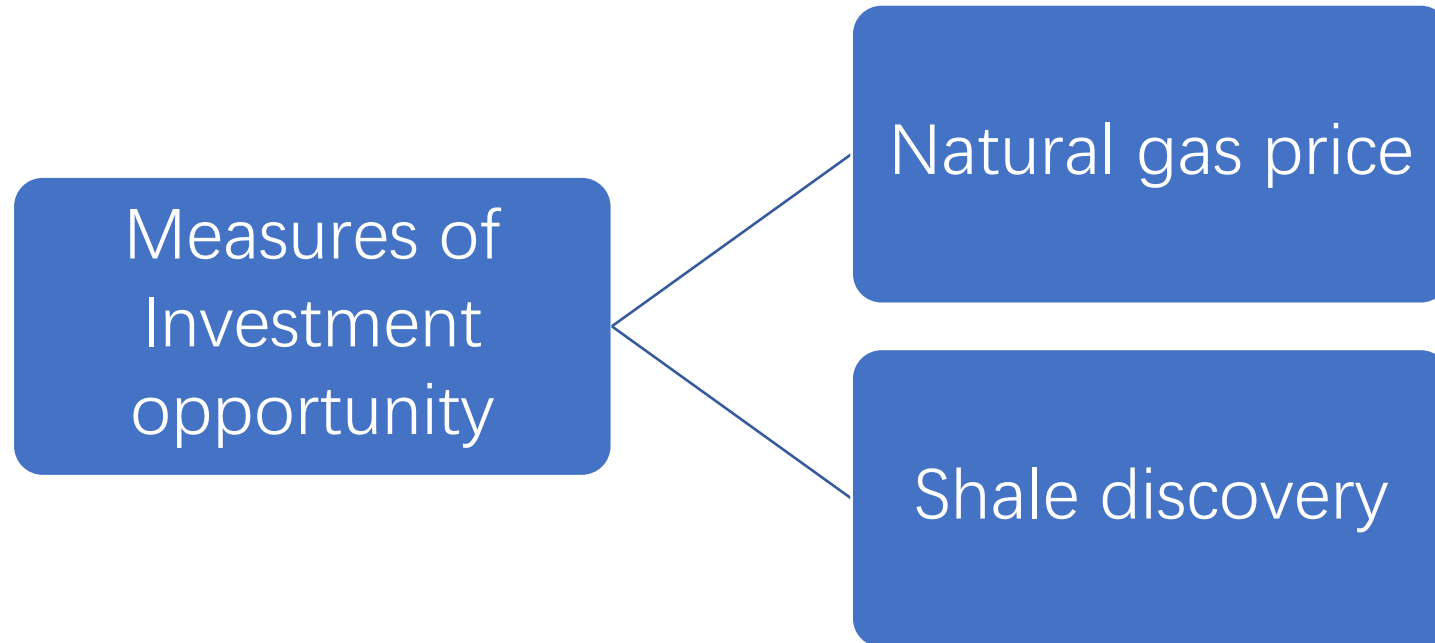
Regression methods

➔ Panel regression with firm fixed effects

$$\begin{aligned} \mathbf{Drilling\ Intensity} &= \frac{\mathit{Drilling\ activity\ (I)}}{\mathit{Capital\ stock\ (K)}} \\ &= \frac{\mathit{total\ number\ of\ wells\ drilled\ in\ a\ given\ year}}{\mathit{total\ number\ of\ wells\ drilled\ over\ the\ previous\ 3\ years}} \end{aligned}$$

$\mathit{Log\ (I)}$

# Findings and Tests



# Findings and Tests

## Natural gas price

$$I_{i,t} = \alpha + \beta_1 Low_t + \beta_2 Low_t * Private_i + \beta_3 High_t + \beta_4 High_t * Private_i + \beta_5 Private_i + FirmFE_i + \varepsilon_{i,t}. \quad (1)$$

=> Whether private and public firms respond are significantly different

$$I_{i,t} = \alpha + \beta_1 NG_t + \beta_2 NG_t * Private_i + \beta_3 Private_i + FirmFE_i + \varepsilon_{i,t}. \quad (2)$$

=> Whether private firms respond differently to changes in the price of natural gas

# Findings and Tests

Drilling responses of public firms are more sensitive to natural gas prices

- When natural gas prices are **low**, private and public firms drill with similar intensity.
- When natural gas prices are **high**, public firms drill significantly more than private firms.

# Findings and Tests

## **Shale gas discoveries**

- Whether public and private firms respond differently to the new investment opportunity created by shale discoveries
- Decompose drilling activity into shale and non-shale wells
- Analyze non-shale drilling activity alone
- Sources of financing frictions



# Findings and Tests

- Whether public and private firms respond differently to the new investment opportunity created by shale discoveries

$$I_{i,j,t} = \alpha + \beta_1 NG_t + \beta_2 PostDiscovery_{j,t} + \beta_3 Private_i + \beta_4 PostDiscovery_{j,t} * Private_i + FirmCountyFE_{i,j} + \varepsilon_{i,j,t}. \quad (3)$$

=> Private firm drilling activity responds significantly less to a shale discovery

# Findings and Tests

- Decompose drilling activity into shale and non-shale wells

$$I_{i,j,t} = \alpha + \beta_1 NG_t + \beta_2 PostDiscovery_{j,t} + \beta_3 Private_i + \beta_4 PostDiscovery_{j,t} * Private_i + FirmCountyFE_{i,j} + \varepsilon_{i,j,t}$$

⇒ Public and private firms differ in their more capital-intensive shale-related drilling activity after a shale discovery

⇒ Private and public firms continue to follow the same drilling policies

# Findings and Tests

- Analyze non-shale drilling activity alone

$$I_{i,j,t} = \alpha + \beta_1 NG_t + \beta_2 NG_t * Private_i + \beta_3 Private_i + FirmCountyFE_{i,j} + \varepsilon_{i,j,t}$$

=> Both private firms and public firms respond but not significantly

# Findings and Tests

- Sources of financing frictions

=> Analyze whether access to external capital is important for the investment behavior we observe

$$I_{i,j,t} = \alpha + \beta_1 NG_t + \beta_2 PostDiscovery_{j,t} + \beta_3 PrivateClose_{i,t} + \beta_4 PostDiscovery_{j,t} * PrivateClose_{i,t} + FirmCountyFE_{i,j} + \varepsilon_{i,j,t}$$

=> The privateclose is the measure between firms and capital providers

# Findings and Tests

- After discovering shale wells, public firms significantly **increase** their county-level drilling activity whereas private firms do not
- Same drilling policies for non-shale wells for both firms
- Differ in the capital-intensive shale-related drilling activity after a shale discover

# Shortcomings and Further improvements

- Lack of ESG discussion

# Contribution to our DT

- Private firms V.S. Public firms
- Good example