Estimating the Cost of Capital Market Distortions: Evidence from Chinese Overseas IPOs
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China's capital market distortion

- Existing literature on China's capital market distortion
    - **misallocation between SOEs and POEs**: Dollars and Wei (2007), Hsieh and Klenow (2009), Song et al. (2011), Wu (2018), Huang et al. (2020)
    - **misallocation among industries**: Brandt et al. (2013), Chang et al. (2016), Chen et al. (2023)
    - **distortion on firm entry**: Brandt et al. (2012), Midrigan and Xu (2014)
    - **capital control**: Liu et al. (2020)
- This paper: Role of capital market distortion on stock valuation discount puzzle.

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Summary of Main Findings

- A model of IPO location choice: capital market distortion v.s. negative selection
- An endogenous treatment effect model to estimate the effects of capital market distortion: unobservables can affect both the IPO location and post-IPO valuation.
    - Using (1) IPO waiting time and relative market index between overseas and (2) domestic stock market prior to a firm's IPO application date as IVs.
    - Using policy shocks (IPO suspension, PE restrictions, capital controls) to validate capital market distortions
- A structural estimation of the welfare loss due to capital market distortion.
- Takeaway: a 66% valuation discount to bypass China's capital market distortions and a 22% welfare gain from removing such distortions.

A recap with q Theory

- The firm solves the following problem

$$V(K) = \max_{I, K', x, \alpha} \frac{1}{1+r'} \left[-H(x) + V(K') \right]$$
$$\text{s.t.}$$
$$I \left(1 + a\frac{I}{K} \right) + wL \leq F(K, L) + x$$
$$K' = (1-\delta)K + I$$
$$0 \leq \alpha \leq 1$$

where the equity issuance cost function

$$H(x) = H_1(\alpha x) + H_0((1-\alpha)x)$$

- H_1 (H_0) **denotes the equity issuance cost in the overseas (domestic) market**

Choices of equity issuance and capital investment

- Euler equation

$$\mu = \frac{1}{1+r'} \left[H_x(x') \left(F_{k'} + a \left(\frac{I'}{K'} \right)^2 \right) + \mu'(1-\delta) \right],$$

  where μ is Tobin's q.

- Let $\delta = 1$, we have

$$\mu = \frac{1}{1+r'} H_x(x') \left(a \left(\frac{I'}{K'} \right)^2 + F_{k'} \right)$$

Listing Choice

- The choice to go listed in overseas ($\alpha = 1$) or in China ($\alpha = 0$)

$$x\left[H_{1,x}\left(\alpha x\right) - H_{0,x}\left(\left(1-\alpha\right)x\right)\right] = \gamma - \eta$$

  where γ and η is the Lagrangian multipier associated with $\alpha \geq 0$ and $\alpha \leq 1$

- Assume that for a firm i, $H_h^i(x) = c_h^i x^i + b(x^i)^2$, $h \in \{0,1\}$, $c_1^i \neq c_0^i$.

- Case 1: A firm j choosing to list domestically ($\gamma > 0$ and $\eta = 0$): $H_x(x') = H_{0,x}(x')$.

$$c_1^j > c_0^j + 2bx^j$$

- Case 2: A firm i choosing to list overseas ($\gamma = 0$ and $\eta > 0$): $H_x(x') = H_{1,x}(x')$.

$$c_1^i + 2bx^i < c_0^i$$

Gap of Tobin's q observed by econometricians

- The gap of Tobin's q between a firm i listed overseas and a firm j listed domestically: $q_1^i - q_0^j = E(q_1 \mid t=1) - E(q_0 \mid t=0)$

$$
\begin{aligned}
q_1^i - q_0^j &= MPK_1^i - MPK_0^j + \widetilde{H}_{1,x'}^i - \widetilde{H}_{0,x'}^j \\
&= MPK_1^i + \widetilde{H}_{0,x'}^i - \left(MPK_0^j + \widetilde{H}_{0,x'}^j\right) + \widetilde{H}_{1,x'}^i - \widetilde{H}_{0,x'}^i \\
&= \underbrace{MPK_1^i + \widetilde{H}_{0,x'}^i}_{E(q_0 \mid t=1)} - \underbrace{\left(MPK_0^j + \widetilde{H}_{0,x'}^j\right)}_{E(q_0 \mid t=0)} + \underbrace{q_1^i - q_0^i}_{E(q_1 - q_0 \mid t=1)}
\end{aligned}
$$

where $q_h^i \equiv \log(\mu_h^i)$, $MPK^i \equiv \log\left(F_{k'}^i + a\left(\frac{I^{i\prime}}{K^{i\prime}}\right)^2\right)$,
$\widetilde{H}_{h,x'}^i \equiv \log(H_{h,x}^i(x'))$.

- For a marginal firm: $q_1^i - \widetilde{H}_{1,x'}^i = q_0^i - \widetilde{H}_{0,x'}^i = MPK^i - \log(1 + r')$

Explanations for Overseas Valuation Discount: $q_1^i - q_0^j < 0$

- $q_1^i = q_0^j$ if (1) symmetric capital market distortion (2) MPK the same between domestically and overseas listed firms
- $q_1^i - q_0^j < 0$ caused by either
  - asymmetric capital market distortion: $\widetilde{H}_{1,x'}^i - \widetilde{H}_{0,x'}^i < 0$, or
  - negative selection: $MPK_1^i < MPK_0^j$ (since $H_{0,x}^i(x') > H_{0,x}^j(x')$)
- This paper finds empirically that $MPK_1^i > MPK_0^j$ and $\widetilde{H}_{1,x'}^i \ll \widetilde{H}_{0,x'}^i$

Discussion

General Comments

- An excellent paper! Learned a lot while enjoying reading.
- Comments mainly focusing on the paper's policy implications

Comments 1: Cost of Capital Market Distortions

- private v.s. social cost of capital market distortion
- Listing domestically increases q and, thus, qK.
- However, higher q crowds out K in equilibrium, implying exacebated capital misallocation.
    - Intuition: given that firms face the same asset demand curve in domestic and overseas markets, higher q in the domestic market implies higher asset supply qK.
    - Households (stock investors) demand a higher asset returns, increasing the funding cost of capital.
- Since orignally overseas listed firms have higher MPK, this implies higher MPK dispersion.

Asset Market Equilibrium
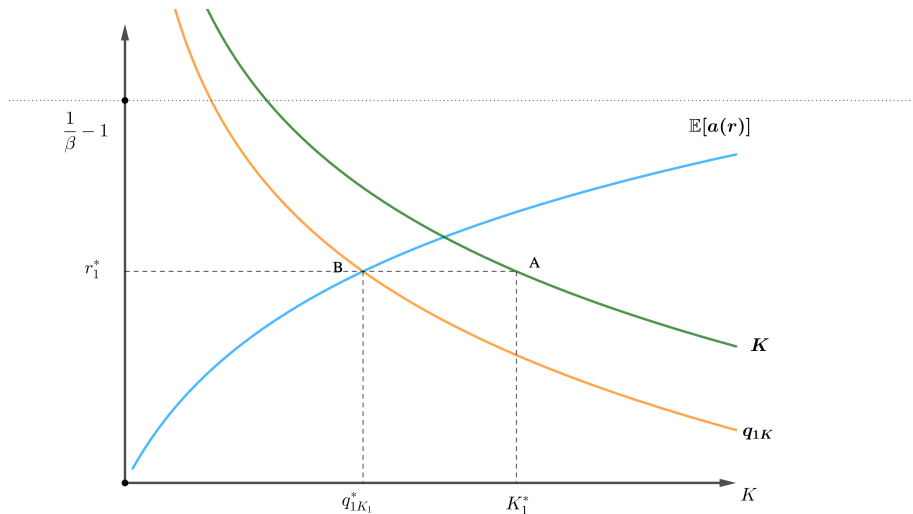
Crowding-out Effects on Capital Investment
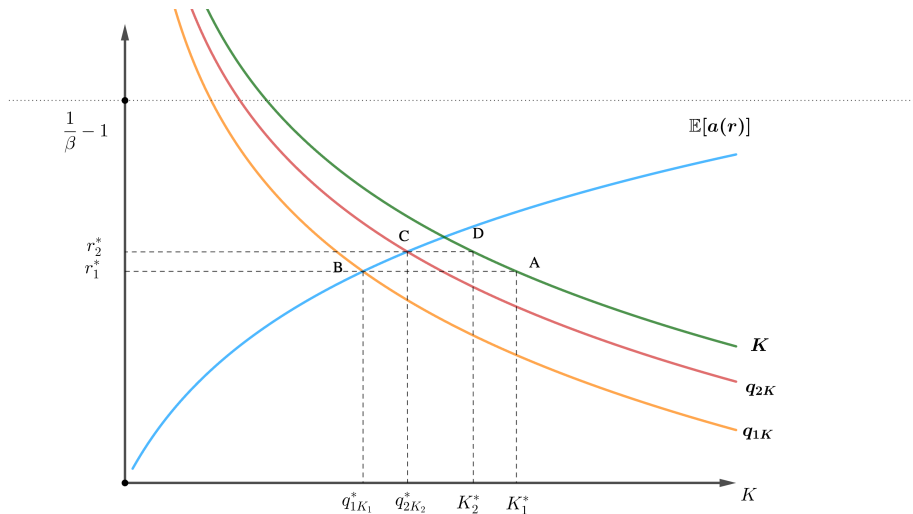
Comments 2: Policy distortion or microprudential policy?

- How to interpret the higher cost of domestic equity issuances (listing) for overseas listed firms?
    - may reflect microprudential policy: e.g. IPO suspension for real estate firms
- April 2010: State Council mandated CSRC to pause IPO for real estate developers.
- Oct. 2010 (Reinstated in May 211): CSRC announced postponement of revewing applications for M&A by real estate developers
- In the decade following 2012, few real estate developers got listed in A share.

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Example: Dalian Wanda

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Comments 3: Endogeneity of IPO Suspension?

- The paper uses IPO suspension (2012-2014) and PE restrictions (2014-2020) as policy shocks.
- However, IPO suspension in 2012 could endogenously respond to fast growth in IPO in 2010 and 2011
  - In 2010, 345 firms IPO, 82.54% of total applications; in 2011, 265 IPOs, 76.81% of total applications.
- Parallel pretrend test between domestic and overseas listed firms.

Comment 4: Speculation as an alternative explanation for H-A puzzle?

- To what extent higher domestic stock valuation capture difference in expected capital gains?

$$\mu = \frac{1}{1+r'}\left[\mu'(1-\delta) + H_x(x')\left(a\left(\frac{I'}{K'}\right)^2 + F_{k'}\right)\right],$$

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近日来，黄金境内外价格出现"倒挂"引发关注。甚至有消息称，有人去香港"人肉"背黄金过境就能轻松赚取一定差价实现套利。

Comment 5: quantitative importance of capital control

- Does overseas IPO as regulatory arbitrage against capital control apply to FIE only?
- If not, what kinds of non-FIE have such incentives?
- How important is this channel?

Concluding Remarks

- Big question, novel idea, and careful empirical design
- if any, more discussion on the cost of capital market distortions
- Look forward to publication in a top journal with revision