Flow-Driven Corporate Finance: A Supply-Demand Approach

Hulai Zhang

Paul Huebner

Stockholm School of Economics

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This Paper

- **Demand-Based Asset Pricing**
  - ▶ Huge growth in literature estimating investor demand & price impact (KY 2019, GK 2021)
  - ▶ **Central Object:** The elasticity of investor demand to asset prices
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  - ▶ Corporate Finance: Supply does not stay fixed — firms actively respond to prices
  - ▶ **Market Timing:** CFOs rank stock prices as a key driver of issuance decisions (Graham & Harvey, 2001)
  - ▶ **Endogenous Characteristics:** X treated as exogenous in demand models are firm decisions
    - Investment responds to asset prices (Q-Theory; Hayashi, 1982)

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- **This Paper**
  - ▶ Provides a **unifying framework** encapsulating how Demand, Supply, and Investment jointly depend on asset prices

■ **Proposition 2: Decomposing the Impact of Demand Shocks**

$$\Delta \boldsymbol{D}_t = \underbrace{\boldsymbol{\zeta}_t^P \mathsf{diag}(\boldsymbol{P}_t)^{-1} \Delta \boldsymbol{P}_t}_{\text{Price Effect}} + \underbrace{\Delta \boldsymbol{Q}_t^F}_{\text{Financing Effect}} - \underbrace{\boldsymbol{\zeta}_t^X \mathsf{diag}(\boldsymbol{X}_t)^{-1} \Delta \boldsymbol{X}_t}_{\text{Investment Effect}}$$

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- **Proposition 3: Equilibrium Multipliers**

  ▶ How flows transmit to Real Investment $(\boldsymbol{M}^X)$ and Issuance $(\boldsymbol{M}^F)$:

$$\underbrace{\Delta \boldsymbol{Q}_t^F}_{\text{Supply}} = \underbrace{\boldsymbol{\Lambda}_t^F (\boldsymbol{\zeta}_t^P + \boldsymbol{\Lambda}_t^F - \boldsymbol{\zeta}_t^X \boldsymbol{\Lambda}_t^X)^{-1}}_{\overset{\text{def}}{=} \boldsymbol{M}^F} \Delta \boldsymbol{D}_t$$

$$\underbrace{\mathsf{diag}(\boldsymbol{X}_t)^{-1} \Delta \boldsymbol{X}_t}_{\text{Investment}} = \underbrace{\boldsymbol{\Lambda}_t^X (\boldsymbol{\zeta}_t^P + \boldsymbol{\Lambda}_t^F - \boldsymbol{\zeta}_t^X \boldsymbol{\Lambda}_t^X)^{-1}}_{\overset{\text{def}}{=} \boldsymbol{M}^X} \Delta \boldsymbol{D}_t$$

  ▶ **Empirical Strategy:** Rather than identifying all underlying structural parameters (ζ, Λ), the paper estimates the multipliers $(\boldsymbol{M}^F, \boldsymbol{M}^X)$ directly.

GRANULAR INSTRUMENTAL VARIABLES (GIV)

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    - ▶ We want to estimate the causal impact of demand shocks ΔD_t on firm outcomes
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    - ▶ Construct instrument Z_{it} from idiosyncratic shocks to large investors
        1. For each investor, extract idio demand shocks as demand changes unrelated to common factors
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- **Estimation: Reduced-Form Multipliers**
  - ▶ For each firm n (pooling...): Regress firm outcomes directly on the Granular Instrument Z_{it}:

$$\Delta P_t = \mathcal{M}_P Z_t + \varepsilon_t \quad \Rightarrow \text{Price Multiplier}$$

$$\Delta S_t = \mathcal{M}_S Z_t + \varepsilon_t \quad \Rightarrow \text{Supply (Issuance) Multiplier}$$

$$\Delta I_t = \mathcal{M}_I Z_t + \varepsilon_t \quad \Rightarrow \text{Investment Multiplier}$$

EMPIRICAL FINDINGS

- **Supply Response** (Share Issuance)
  - ▶ **Short Run (1Q):** \$1 flow $\rightarrow$ **1.2 cents** issuance
  - ▶ **Long Run (2 Years):** \$1 flow $\rightarrow$ **24 cents** issuance
  - ▶ **Asymmetry:** Firms respond to inflows (**85 cents**) but not outflows (**0.5 cents**)

- **Investment Response**
  - ▶ **Short Run:** Zero / Insignificant
  - ▶ **Long Run (2 Years):** 1% flow $\rightarrow$ **0.19%** higher investment

- **Role of Investor Preferences**
  - ▶ **Counterfactual:** Shutting down investors' demand for investment increases the impact of flows on investment
  - ▶ That is because investors prefer firms with low investment

COMMENT 1A: GIV VS. IV

- **The Logic of Granular Instrumental Variables (GIV)**
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  - ▶ Compare demand changes of large vs. small investors (controlling for common factors)

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- **Trade-off: Portability vs. Concreteness**
  - ▶ *GIV:* Can estimate elasticities in settings where explicit natural experiments are hard to come by (e.g., macro)
  - ▶ *Standard IV:* Focuses on known, concrete sources of exogenous variation (e.g., fire sales)
  - ▶ Standard IVs are generally more convincing because the source of variation is known and the exclusion restriction is easier to assess

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- **The Exclusion Restriction**
  - ▶ Large investors' demand shifts need to be orthogonal to supply or investment shocks
  - ▶ **Example: Activism.** Changes in ownership by large investors (vs. small) directly affect corporate governance and investment policy
  - ▶ The GIV may drive investment directly (Activism), not through its impact on asset prices

COMMENT 1B: GIV VS. IV

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- **Cross-Sectional Instruments in Time Series**
  - ▶ Flow-induced trading is a **Bartik-style instruments**
  - ▶ Identification comes from the (ownership) **shares** (Goldsmith-Pinkham, Sorkin, Swift, 2020)
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- **So is GIV the only path forward?**

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    - ▶ *Signaling:* High asset prices of similar firms signal sector-wide investment opportunities beyond current own-price

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- **Practically hard to estimate a full supply elasticity matrix**...
    - ▶ ... but is there an alternative way of restricting cross elasticities?

An Alternative Path: HHHKL

- Assumption of *homogeneous substitution conditional on observables X*
  - ▶ Investors care about characteristics X when substituting across assets
- Separation of elasticity matrix into a relative part and a part related to spillovers
  - ▶ Estimate the relative part from cross-sectional IV, controlling for X
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- **Could apply directly to paper's setting**
  - ▶ Assumption translates: Firms compete for capital with peers sharing characteristics X
  - ▶ Can use more convincing cross-sectional IV to show how firms with funding advantage issue more than comparable firms (the **relative** part)
  - ▶ And can still use GIV to estimate how aggregate issuance and investment depend on aggregate prices, and how exposed firms are to it (the **spillover** part)

COMMENT 3: THE PUZZLE DEEPENS

- **Standard Inelastic Market Hypothesis (Fixed Supply)**
  - ▶ Assumes supply is fixed ($\zeta_S \approx 0$)
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- **This Paper: Supply Leans Against the Wind**
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- **The Inelastic Demand Puzzle Deepens**
  - ▶ We observe high price volatility ΔP despite the stabilizing force of endogenous supply
  - ▶ This implies that the true demand elasticity ζ_D must be even **lower** than standard estimates

Comment 4: Interpretation and Counterfactuals

- **Total vs. Partial Derivative**

  ▶ Supply (S) and Investment (I) are likely correlated (e.g., issuance funds investment)

  ▶ Regressing I on instrumented P estimates the **Total Derivative**:

  $$\frac{dI}{dP} = \underbrace{\frac{\partial I}{\partial P}}_{\text{Q-Theory}} + \underbrace{\frac{\partial I}{\partial S}\frac{dS}{dP}}_{\text{Relaxing Financial Constraints}}$$

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- **Implications for Counterfactuals**
  - ▶ **Flexible Supply World:** Estimates are **valid**. They answer: "What happens when prices move and firms re-optimize everything?"
  - ▶ **Fixed Supply World:** Estimates are **invalid**.
  - ▶ To ask "How does price affect investment keeping supply fixed?", we would need to disentangle the partial derivative $\frac{\partial I}{\partial P}$ from spillovers of supply to investment

Conclusion

- Great conceptual contribution!

- Integrating endogenous investment & supply into one big demand-supply-investment framework

- Paper currently focuses on GIV as its main identification strategy

- ... moving to more specific source of exogenous variation & incorporating supply spillovers is feasible (HHHKL)