Discussion of "In Search of the Origins of Financial Fluctuations: The Inelastic Markets Hypothesis"
by Xavier Gabaix & Ralph Koijen

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Research agenda in macro-finance

- wanted: model s.t.
  - volatility in asset prices (stocks, houses, bonds, etc)
  - financial intermediaries
  - microfounded to allow for welfare analysis

- intermediated investments are often mechanical
  - funds have mandates (for example, constant portfolio shares)

- good amplification mechanism for small aggregate shocks?
Contribution

- key new statistic: price-elasticity of stock demand
- empirical strategy to estimate this statistic from Gabaix-Koijen (2020)
- fascinating empirical finding:
  - price-elasticity of aggregate stock demand is low: $-\frac{1}{5}$
  - flipside: more demand for stocks has big price impact, multiple of 5! another dollar spent on stocks pushes stock values up by 5 dollars
- model that explains inelastic demand for stocks and volatility
Discussion

- How does the model explain inelastic stock demand and volatility?
- Relate to existing work on mechanical investing
- Next steps
Lucas Tree Model

- rep agent with standard preferences
  \[ E \sum_{t=0}^{\infty} \beta^t \frac{C_t^{1-\gamma}}{1-\gamma} \]

- endowment stream \( \Omega_t \)

- stock pays dividend stream \( D_t \)

- total supply of goods \( Y_t = \Omega_t + D_t \), with iid growth rate

- one-period bond in zero net supply
Model in Gabaix and Koijen

- key assumption: rep agent cannot choose asset holdings freely
  - all stocks and exogenous amount of bonds $\bar{B}_t$ held through mixed fund
- optimization problem

$$\max_{C_t, B_t} E \sum_{t=0}^{\infty} \beta^t \frac{C_t^{1-\gamma}}{1-\gamma}$$

$$C_t + B_t + \bar{B}_t = (B_{t-1} + \bar{B}_{t-1}) R_{t-1}^f + Y_t$$

- rep agent can choose bonds $B_t$ freely
  - standard Euler equation

$$1 = E \left[ \beta \left( \frac{C_{t+1}}{C_t} \right)^{-\gamma} R^f \right]$$

  - iid equilibrium consumption growth: $R^f$ is constant
Model in Gabaix and Kojien

- mixed fund holds exogenous amount of bonds $\bar{B}_t$ and stocks $Q_t$
  - wealth in fund $W_t = \bar{B}_t + P_t Q_t$
  - maintains portfolio share $\theta$ on stocks, $\theta = \frac{P_t Q_t}{W_t} = 80\%$
  - stock demand by fund $Q_t = \frac{\theta W_t}{P_t}$

- market clearing $Q_t = 1$, so
  
  $$\text{stock price } P_t = \frac{\theta}{1 - \theta} \bar{B}_t = 4\bar{B}_t$$

stock price volatility is driven entirely by intermediated bonds $\bar{B}_t$

- what is the price-elasticity of stock demand?

  $$\frac{d \log Q}{d \log P} = -1 + \frac{d \log W}{d \log P} = - (1 - \theta) = -\frac{1}{5}$$
Comments

- model makes three important assumptions:
  - fund portfolio share $\theta$ is exogenous
    - paper has more elaborate, including time-varying, exogenous $\theta$’s
  - all stocks are in the fund
  - amount of bonds $\Bar{B}_t$ is exogenous

- $\theta$, stocks in the fund and $\Bar{B}_t$ are not chosen by the household
  - household chooses $B_t = -\Bar{B}_t$ in equilibrium

- next step: endogenize relative positions of mechanical investors
  - natural candidate: model with heterogeneous agents
Endogenizing flows

- Chien, Cole & Lustig 2011 (ReStud), 2012 (AER)
- heterogeneous agents
  - standard preferences
  - endowments hit by idiosyncratic shocks
  - aggregate endowment has iid growth rate
- everyone chooses consumption/savings optimally
- 3 types of agents differ in their savings technologies:
  1. mechanical: fixed portfolio share $\theta$ in stocks, $1 - \theta$ in bonds
  2. nonparticipant: only in bonds
  3. active: no constraints
- solving for equilibrium is difficult
Equilibrium properties of Chien, Cole & Lustig

- endogenous wealth of mechanical investors
  - depends on performance on their rule

- active investor absorbs mechanical trades
  - also borrows from others to clear bond market

- stock price determined by Euler equation of active investor
  - in bad aggregate state: position of active investor is more leveraged and risky, worth less
  - in good aggregate state: position is safer, worth more

  $\Rightarrow$ stock price is highly volatile

- what would Gabaix-Koijen econometrics find in this environment?
  - do we need more than endowment shocks?
  - what is price-elasticity of aggregate stock demand?
Bottom line

- low price-elasticity of stock demand is nice diagnostic tool
- mechanical investing helps to get low elasticity
- rep agent model with mechanical investing
  - intermediated bond holdings $\tilde{B}_t$ are exogenous, all stocks intermediated
  - determines stock price entirely by flows, not through Euler equation
- next step: heterogeneous agent models
  - some agents are mechanical investors (as in Chien, Cole and Lustig)
  - other agents are active and their Euler equations hold
  - use diagnostic tools to learn about shocks, elasticities
  - interesting heterogeneous welfare effects?