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 Ω_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

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

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

- 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 Koijen

- 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 θ 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 θ is exogenous
    - paper has more elaborate, including time-varying, exogenous θ's
  - all stocks are in the fund
  - amount of bonds $\bar{B}_t$ is exogenous
- θ, 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 θ 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

  $=>$ 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 $\bar{B}_t$ 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?