Disagreement, Speculation, and Aggregate Investment

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Discussed by Jaroslav Borovička (NYU)

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Plan for the discussion

- nice clean paper
- clearly separates two channels

$$\begin{aligned} Y_t &= AK_t = C_t + I_t && \text{consumption-investment decision} \\ C_t &= C_{a,t} + C_{b,t} && \text{consumption distribution} \end{aligned}$$

- mitigates some undesirable effects generated in heterogeneous agent economies with iid consumption growth

Plan for the discussion

1. Comment on the way how optimists and pessimists are modeled
   - speculation vs. preference for consumption/saving
2. Discuss the mechanism and results
   - asset pricing implications (qualitative / quantitative)
   - role of the wealth distribution as the state variable
   - 'anomalies'

Modeling of belief distortions

- Agent j with **subjective probability measure** Q_j

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with

$$M_{j,t} = \exp\left(\int_0^t u_{j,s} dW_s - \frac{1}{2}\int_0^t \left|u_{j,s}\right|^2 ds\right)$$

(here, the disagreement process $u_{j,s} = \left(\delta_z - \delta_j\right)/\sigma$)

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- The agent then **perceives a different trend** in quantities that are driven by the Brownian motion:

$$\frac{dK_t}{K_t} = \left(\phi\left(i_t\right) - \delta_j\right) dt + \sigma dW_{j,t}$$

Two consequences

1. Agents' **disagreement** modeled through different M_j processes leads to volatile relative consumption allocations (static problem $C_t = C_{a,t} + C_{b,t}$)

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   - Good shock: higher risk-free interest rate and (in a production economy) a lower saving rate.
   - Auhors call this **speculative aggregate consumption risk**. Is it about speculation?

Risk-free rate vs risk premium effects

In **good times**, optimists gain a larger wealth share

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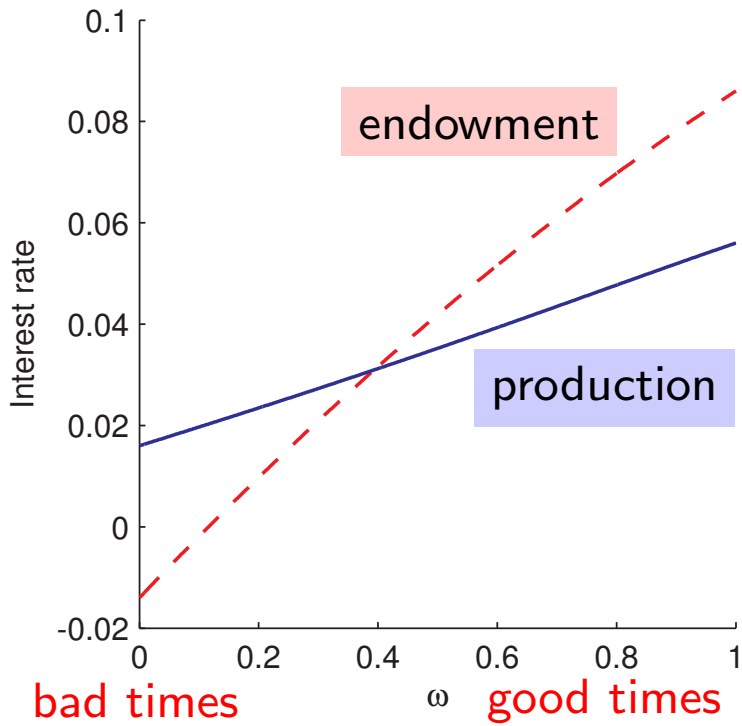
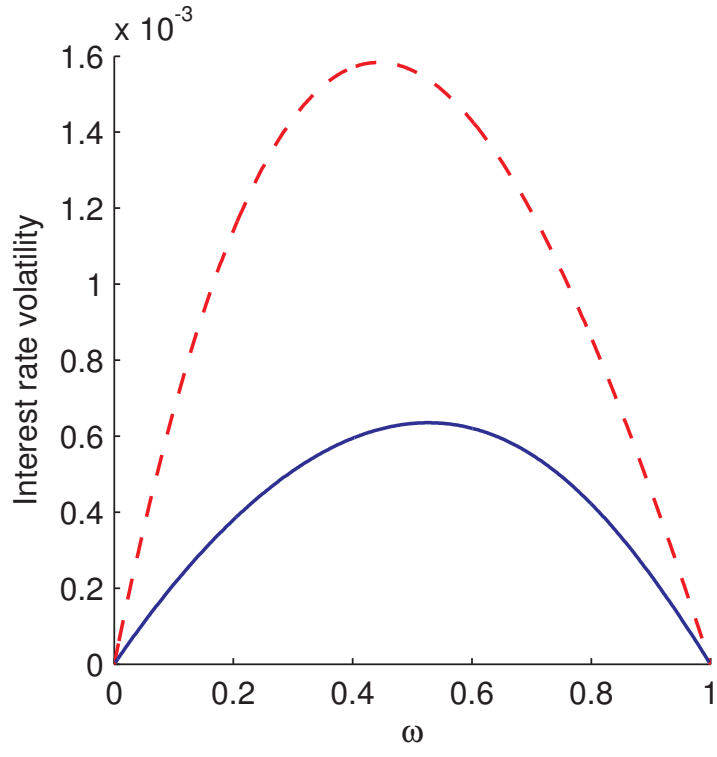
- Recursive (Duffie-Epstein-Zin) preferences with $IES > 1$.
  - $IES > 1$ will flip the result.

Qualitative and quantitative success of the results

- Authors claim superior performance relative to an endowment economy
  - heterogeneous beliefs but iid aggregate consumption growth.
- But do we gain also relative to a similar economy with homogeneous beliefs?
- Or are we just (at least partially) correcting unappealing features of the endowment economy?

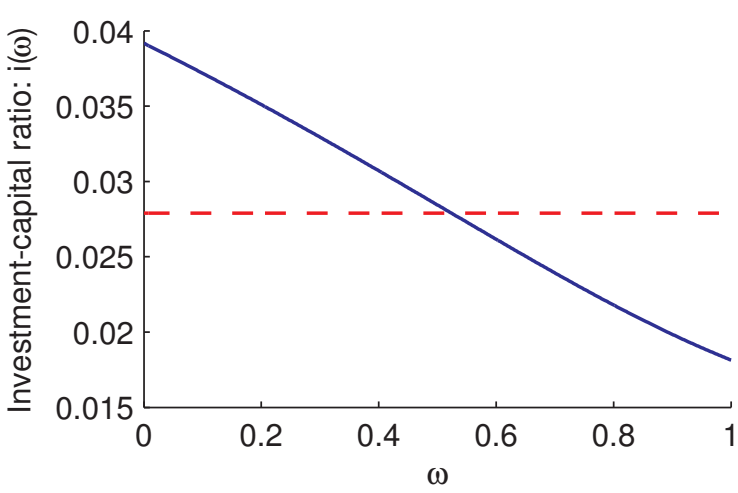
Interest rates

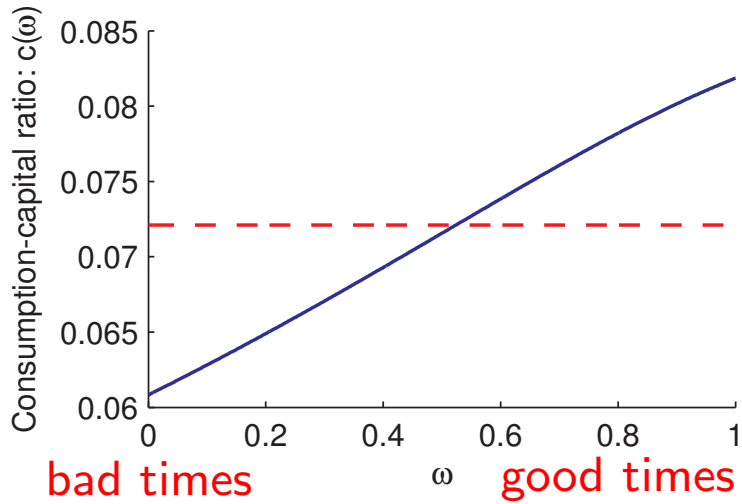




- IR less sloped than in the endowment economy $\Longrightarrow$ lower volatility
- but in the representative agent economy, IR is constant

Consumption and investment

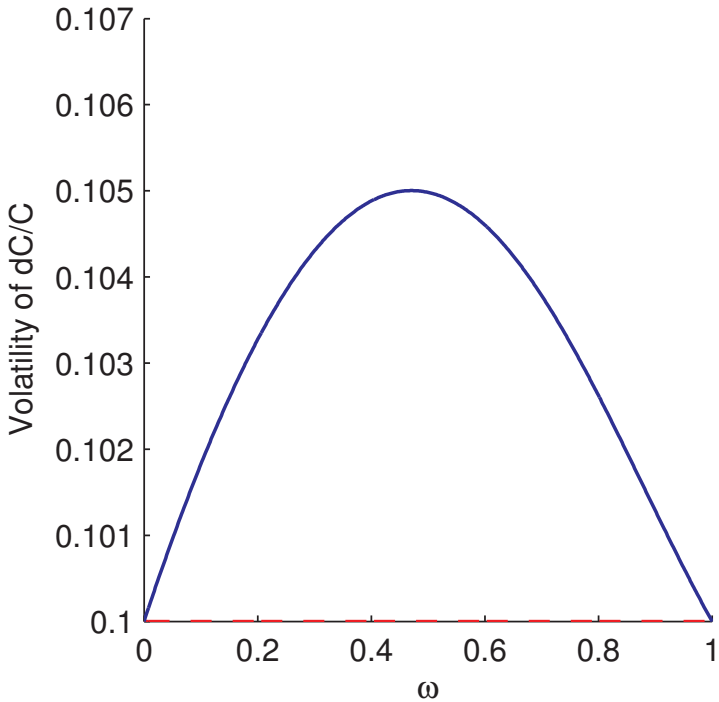




bad times good times

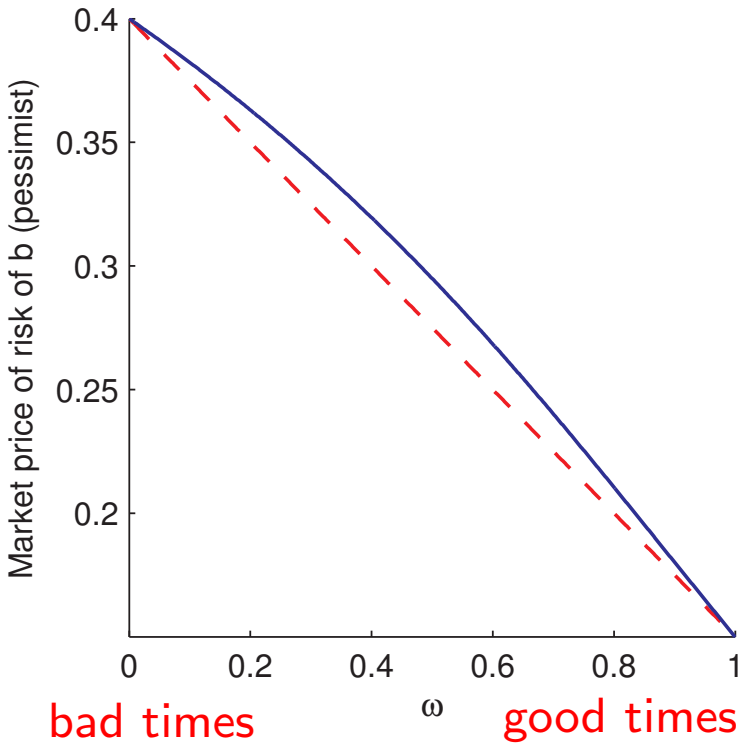
- aggregate consumption: $C_t = \frac{C_t}{K_t} K_t$ (and $\frac{C_t}{K_t}$ and K_t move in the same direction)
- consumption more volatile than investment (equal volatility in representative agent economy)

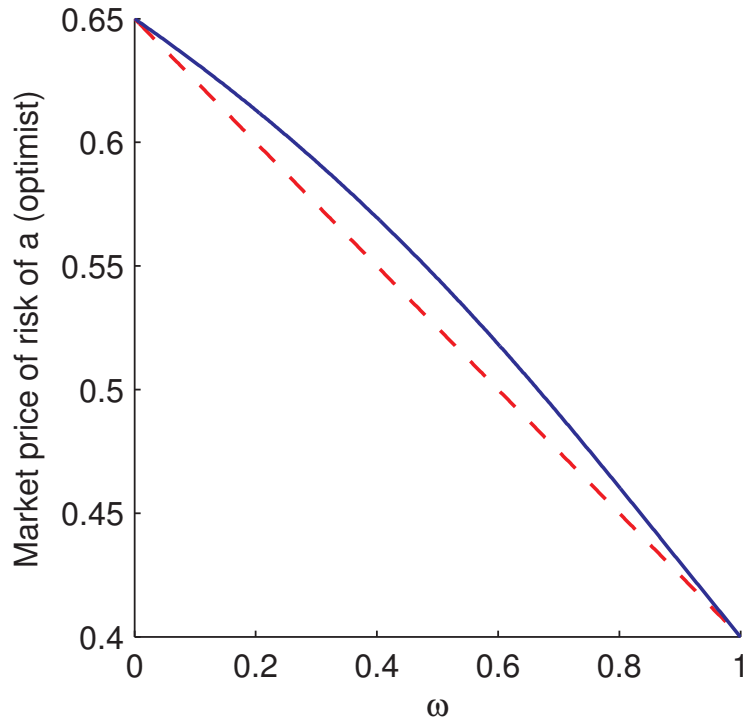
Consumption volatility



- aggregate consumption volatility increases, but only very modestly
- price of risk will also increase only very modestly

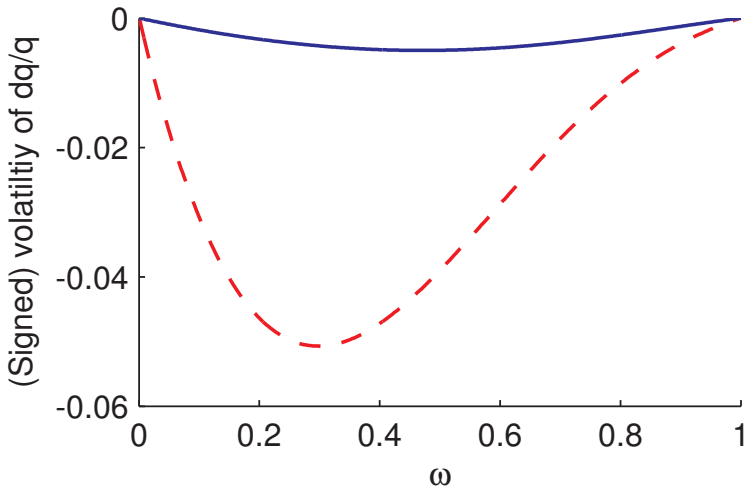
Price of risk

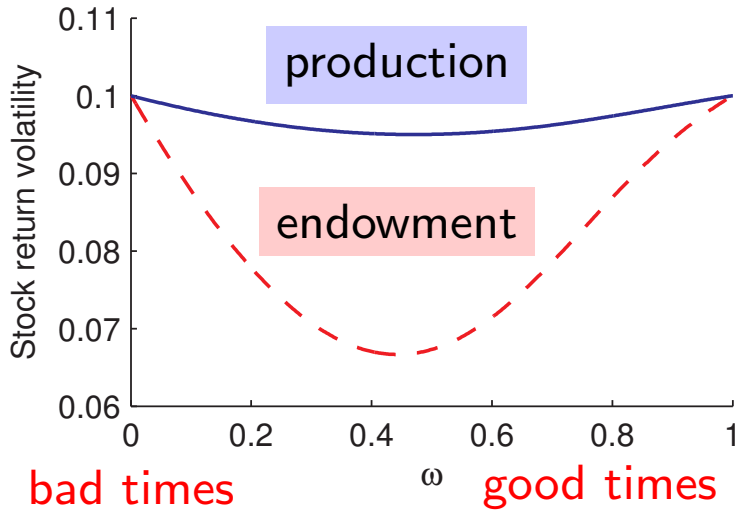




- price of risk a weighted average of the prices in homogeneous agent economies
- small endogenous effect generated by the heterogeneity

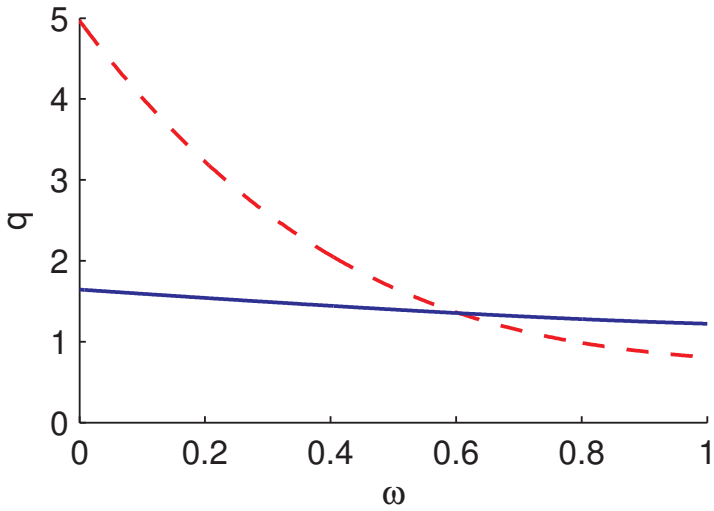
Stock return volatility

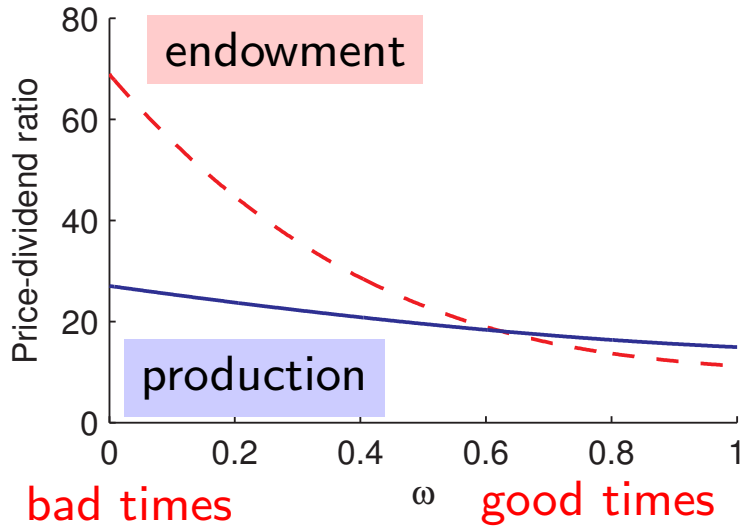




- stock return volatility in the endowment economy lower than in the homogenous agent economy
  - strongly procyclical risk-free interest rate
- **production economy**: risk-free rate less procyclical
  - stock returns still less volatile than in the homogeneous agent economy

Price-dividend ratio





- risk-free rate strongly procyclical, risk premia modestly countercyclical
- $\Longrightarrow$ price-dividend ratio countercyclical, although less than in the endowment economy

Fluctuations in the wealth distribution

The only relevant state variable is the wealth distribution.

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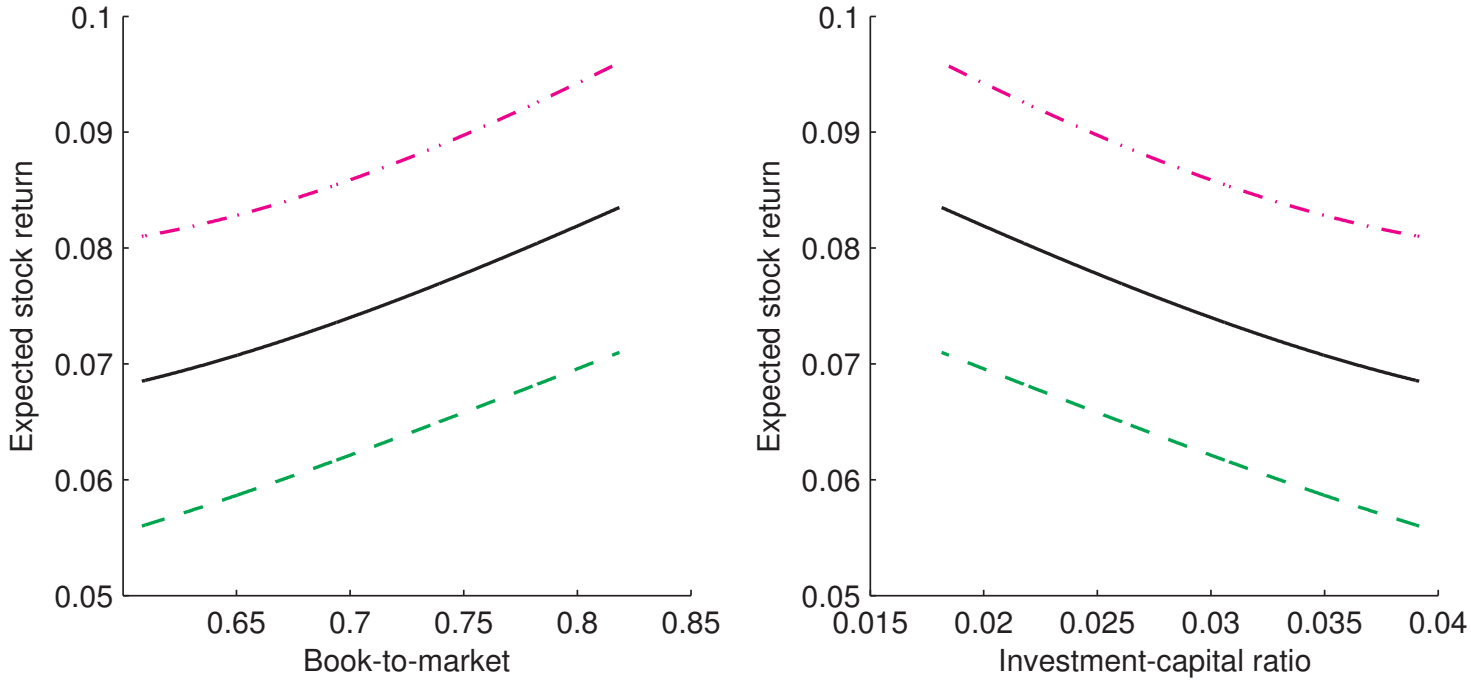
Long horizon implications

- No steady state distribution for wealth share.
- Recursive preferences would address this (*Borovička (2013)*).

Anomalies



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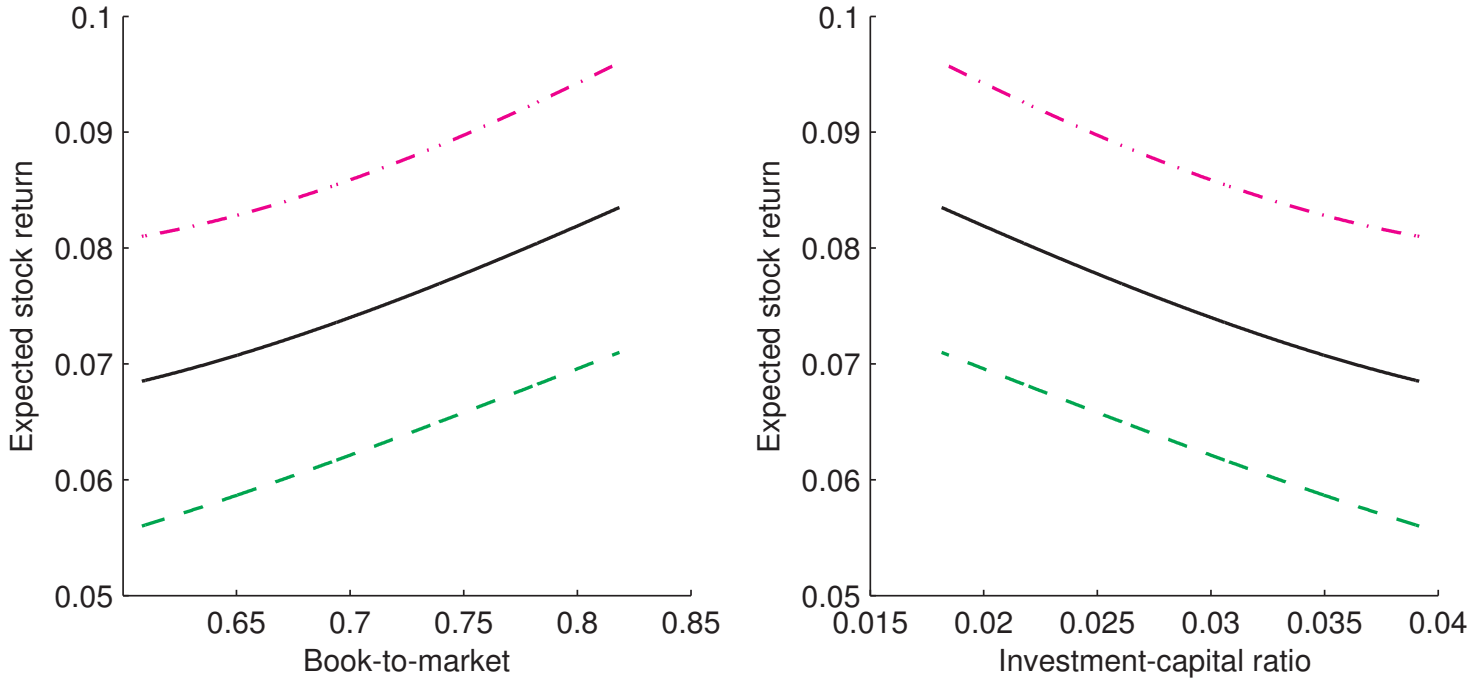

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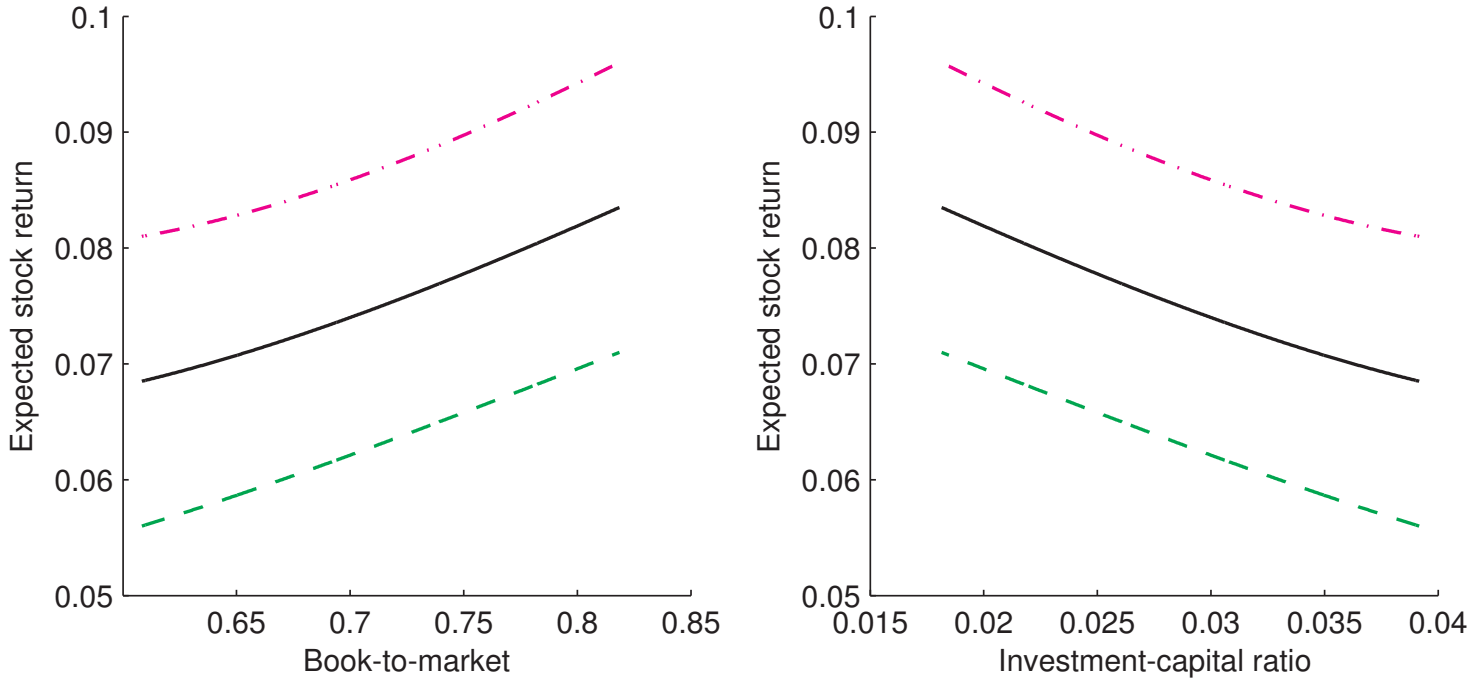

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  - the logic then must be (?) that different firms are permanently in good or bad times and thus have different associated risk premia
- but the above shape is driven by the **risk-free rate effect**, not risk premium
  - value / size premia are about risk premia

Summary

- Belief heterogeneity in a simple **endowment economy generates many undesirable features**
  - speculation (betting) vs. preferences for consumption / saving
- Adding **production side** **alleviates these problems** to some extent
  - model still performs worse in many aspects than a homogeneous economy
- Separating **IES** and **risk aversion** would help much more (Duffie-Epstein-Zin)
- Is the **wealth distribution** mechanism the right story?
- Anomalies . . .
- Still a nice paper: uncovers all these features in a very transparent way.