Two Puzzles in Household Finance

Compared to model predictions, data indicates households are not so interested in stock investment.

1. Stock participation rate: < 50%
2. Risky share (conditional on participation): ≈ 55%

Why? A crucial element: labor income and its risk:
- Labor income process
- Interplay between labor and financial markets → main consideration in this paper

Model

1. Households’ optimization problem with Epstein-Zin preferences:

   \[ V_c = \max_{\alpha, \beta} \left\{ \alpha \cdot R_{\text{LP}}^{t+1} + \beta \mathbb{E} \left[ V_c \mid \pi_c, \alpha, \beta \right] \right\} \]

   Controls:
   - \( \alpha, \beta \): risky share controls the portfolio return \( R_{\text{LP}}^{t+1} = \alpha R_{\text{LP}}^{t+1} + (1 - \alpha) R_{\text{LP}}^{t+1} \)

   States:
   - \( \pi_c \): wealth
   - \( Y_{t+1} \): labor income
   - \( R_t^2 \): stock return

   Parameters:
   - \( \beta \): discount factor
   - \( \psi \): risk aversion
   - \( \phi \): elasticity of intertemporal substitution

2. Labor Income Process (\( Y_t \))

3. Stock Returns Process (\( R_t^2 \))

Effect of BS-Corr on investment decisions

Including between-squares correlation significantly:
- Raise participation wealth threshold
- Lower the optimal risky asset shares

And thus, the model including BS-corr matches SCF data well.

Portfolio perspective of BS-Corr effect

Assume a portfolio including a share of stock and one unit of labor income flow.

Given other moments fixed (including correlation), between-squares correlation has nonlinear effect.
- From panel (a) portfolio risk with changing BS-Corr (\( \phi \)): More risk
- From panel (b) corresponding policy functions
  - BS-Corr: 0: more likely to enter the market
  - BS-Corr deviates from 0: households reduce their risky asset holdings.

Empirical Evidence of BS-Corr

- BS-Corr has significant effect
- Nonlinear effect

Conclusion

1. We document the existence of between-squares correlation in the data.
2. Introducing between-squares correlation lowers participation rates and risky asset holdings, conditional on participation.
3. The perspective from portfolio helps understand between-squares correlation better and shows a nonlinear pattern.

Between-squares Correlation (BS-Corr)

Definition: \( \text{Corr}^{\text{BS}}(X, Y) \leq \text{Corr}^{\text{BS}}((X - E[X])^2, (Y - E[Y])^2) \)

Advantages:
1. Nonlinear feature → A better measure of extreme co-movement
2. It is normalized co-kurtosis → dependence through higher-order risks
3. More possible dependence patterns. Under mixture normal:


Stylized Facts of BS-Corr

Significant and positive BS-Corr between income and stock returns.

Data:

Chart 1. Stylized Facts of between-squares Correlation
- Positive across all groups
- 1/3 households > 0.1
- 1/5 households > 0.2

Calibration

Labor income

Stock Return

Dependence Structure:

Preference:

- Corr = 0 (consistent with literatures)
- Small BS-Corr but significant effect.
- Precise calibration.

- BS-Corr has significant effect
- Nonlinear effect

Empirical Evidence of BS-Corr

- BS-Corr has significant effect
- Nonlinear effect

Reference