Life-Cycle Portfolio Choice with Imperfect Predictors, by Alexander Michaelides and Yuxin Zhang

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Main takeaway

- What impact does imperfect return predictability have on portfolio choice *over the life cycle*?
  - **Imperfect predictability**: E_t(returns) *unobserved* and proxies (e.g., D/P) *noisy*
    - Clearly true since we are constantly trying to forecast returns better
    - Important given economic significance of predictability
  - **Main result**: Imperfect predictability $\Rightarrow$ less invested in equities over life-cycle.
    - Especially in younger years
    - Intuition?: Parameter uncertainty $\Rightarrow$ stocks riskier in the long run (e.g., Pástor and Stambaugh, *JF* 2012)

Understanding potential contribution

- Typically models are judged based on their **predictions**, this paper asks what we get from a clearly true, but overlooked, **assumption**
- Portfolio choice background facts:
  - Low stock-market participation (50% of U.S, households)
    - Perhaps an extension can help explain this?
  - "Too" little equity in portfolios ($\approx 50\%$)
    - Paper helps explain this...via new uncertainty in equities
  - %Equity allocation decreases over life cycle
    - Paper helps explain why, in spite of this, young hold "too little" equity: imperfect predictability $\Rightarrow$ stocks riskier in long run (Pástor & Stambaugh, 2012).

Comments outline

- Overall, interesting result w/ lots of sensitivity analysis
- A few **Interpretation/economic significance** questions
  - Perhaps they can be explained away
- **Extensions**
  - One-trick pony?: Would like to see more predictions/applications of model

Interpretation/economic significance

- Want more complete discussion of **intuition behind learning mechanism**

  "...[most recent portfolio choice] models predict that "stocks are for the young". With imperfect predictability, consistent with Pastor and Stambaugh (2012), stocks become more volatile in the long run, and therefore young households hold more conservative (balanced) portfolios, on average."

- What happens as agents learn?
- How much does learning mitigate excess uncertainty?
- Does the story require young not being able to learn from the old?
- Who should be at a learning disadvantage?
  - Young have *more* historical data? better processing tech?
  - Learning perhaps more relevant for labor-stock moments (see below)

Interpretation/economic significance

- Not entirely clear what to make of calibration/whether data is *representative*
  - Admittedly; and not main goal
  - But would be nice to see something in data captured by model
- 2007 SCF: flat/hump-shaped %equity allocation (α)

TABLE 3

Data and Model over the Life Cycle

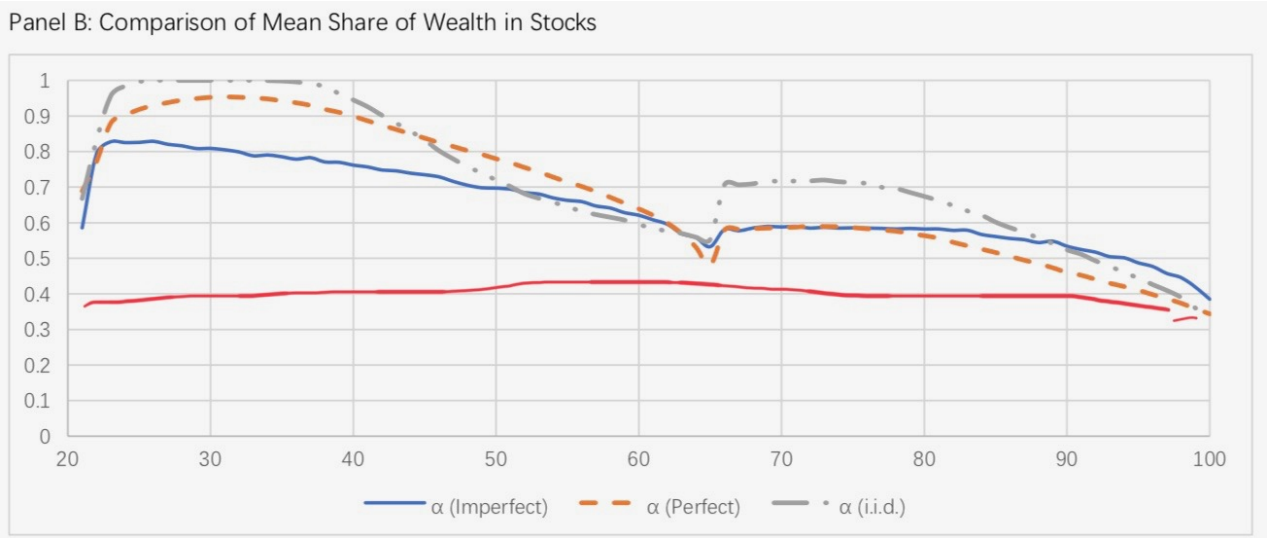
Table 3 compares the W/Y ratio and the mean share of wealth in stocks (α) betwee the 2007 U.S. Survey of Consumer Finances (SCF) and the baseline model .

Age Group	W/Y (SCF)	W/Y (Model)	Empirical α (SCF)	Mean α (Model)
18-34	0.91	0.81	0.41	0.79
35-44	1.80	3.15	0.47	0.76
45-54	3.45	6.07	0.48	0.70
55-64	5.66	9.04	0.48	0.62
65-74	9.30	9.51	0.41	0.58

- 2007 right before great reccession—perhaps non-representative
- Mixes cohorts
  - Perhaps each individual decreases equity allocation *over time*, but people born in 1937 invest more in equity than those born in 1977
  - (e.g., Malmendier and Nagel *QJE* 2016)

Interpretation/economic significance

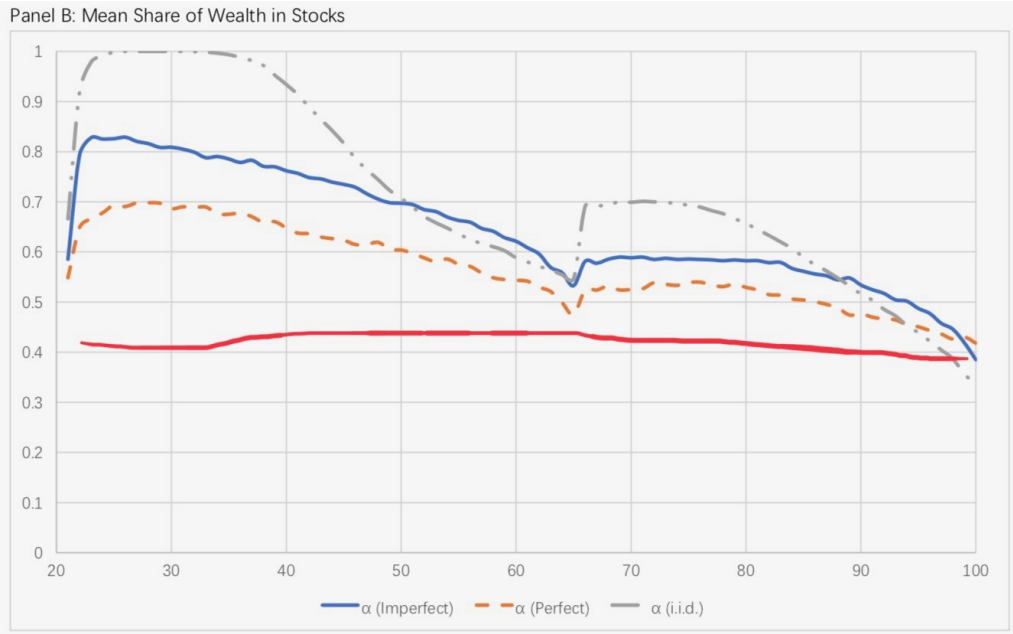
- Fig 1B: %Equity allocation over life cycle by DGP (investors assume correct DGP)



- Red line is imposed SCF data
- Is there a subset of investors in the SCF or PSID that can fit this data?
- What **portion** of misfit is explained by imperfect predictability

Interpretation/economic significance

- Fig 2B: DGP = imperfect predictability world, investors assume three different DGP's.



- I can forecast returns *relatively well*
  - But I still invest as though returns are i.i.d., as do most advisors
- Don't most act as though returns are iid? (Gray line / furthest from data?)
- Does this deepen a puzzle? Perhaps participation/adjustment costs?

Extensions:

- The main result is important, but model would benefit from richer set of predictions
- Some possibilities (not necessarily well ordered):
  1. Return predictability is concentrated in recessions (e.g., Cujean & Hasler *JF* 2017)
     - If *imperfect predictability* is too, helps explain anomalously low equity demand/high risk premia in bad times relative to i.i.d. in good times.
  2. Not completely clear how much learning should be in i.i.d. case.
     - E_r known? If not, what do we make of "i.i.d." case as it is not implementable?
     - Know from Goyal and Welch (2008) that historical average often works as well as predictive regressions in real time.

More extensions:

3. Labor income more and more important in recent life-cycle models
   - Fagereng, Guiso, and Pistaferri *RESTUD*, 2018 Schmidt WP 2016, and others: Uninsurable labor income and labor *tail* risk more important than previously documented.
   - Predicting/learning about labor/equity correlations/risks perhaps more important to investors than predicting mean equity returns...
   - ...and characterized by *imperfect predictability*
   - Bonaparte, Korniotis, and Kumar *JFE* 2014: Dutch National Bank Household Survey contains better data for labor market-stocks correlations.

Conclusion

- I am surely out of time for a conclusion by now
- Interesting paper
- Clarify intuition
- What else can we do with imperfect predictability?
  - Esp. labor moments?