Portfolios for long-term investors

John H. Cochrane

Hoover Institution, Stanford University

January 21 2021
Introduction and Payoffs

Introduction
▶ Theory vs. practice
▶ Look at the payoffs (dividend stream) not one period returns
▶ General equilibrium + heterogeneity.

Payoffs
▶ The indexed perpetuity is the riskless asset for the long-term investor
▶ Payoffs vs. state variables.
▶ Stocks are a lot like bonds.
▶ Apply the same idea? Buy stocks for, evaluate strategies by the dividends (payoffs).
Price and ex-post dividends, discounted at a constant rate. (Shiller 2014)

Shiller: “Buy stocks for the dividends!”
The payoff view

- Fallacies? Live off the dividends? Paper profits? Illiquid assets? Not marking to market?
- Merton portfolio and consumption / payout theory.
  - iid $c = kW$? People don’t. Equity premium.
  - $u'(c) = V_W(W, X)$? Institutions do $c = kW$, ignore $X$.
- Think directly about price and dividend (payout) streams.
- ... and the aggregate consumption claim is the risky asset...
- Complete markets

$$
\max \sum_{t,s_t} \beta^t \pi(s_t) u[c(s_t)] \text{ s.t. } \sum_{t,s_t} \beta^t \pi(s_t)m(s_t)c(s_t) \leq W
$$

$$
u'[c(s_t)] = \lambda m(s_t)
$$

- Incomplete markets

$$
\max \sum_{t,s_t} \beta^t \pi(s_t) u[c(s_t)] \text{ s.t. } c(s_t) = \sum_i w_i x_i(s_t), \sum_i w_i p_i \leq W
$$

- Markowitz does Merton applied to payoff stream! Two fund theorem, hedge outside income. Cashflow betas.
- $\{u[c(s_t)]\}$ not $V(W_{t+1}, X_{t+1})$
- Dynamic trading? Characterize the payout stream.
General equilibrium

Idea

- State a view of the economic function of markets, your place.
- Describe a general equilibrium, and how investors are heterogenous.
- Why? We don’t see the prices \((E(R) \text{ and } \Sigma)\) of portfolio theory.

General equilibrium heuristics for portfolio decisions (and advice):

- *The average investor must hold the market portfolio.*
- *Any deviation from market is a financial zero-sum game.*
- If you’re not different from average, index. No rebalancing.
- \(\Sigma^{-1}\mu\) is hopeless.
- How are you different? Smarter than average?
- *The placebo test. The who should sell test.*
- *The look in the mirror, dinner with lions, look around the table test.*

Lessons for us

- Portfolio theory must be all about heterogeneity.
- Economics of risks and returns, time-variation, fortify statistics.
Incorporating 50 years of asset pricing

Program:
- Many new views / facts of how markets work.
- No direct portfolio implications. How do prices change so the average investor holds market?
- Complete models. Add heterogeneity. Portfolios (& payouts)!

Classic Merton / ICAPM
- Purpose: intermediation.
- Heterogeneity: risk aversion. iid Two fund.
- General equilibrium thinking is useful for portfolio advice!

Extensions
- Recursive utility, people differ by horizon too. (Solve hard model)
- Hedge portfolios (more stocks) for long horizon investors.
A giant insurance market?  

A giant insurance market. Investors differ by outside income/liability.  

- First, hedge outside income! Hedge demand creates factors.  
- Price of S&P 500 dividends?  
- Solution: find dividend stream closest to income stream.  
- Income streams likely look like dividend streams, not bond streams!  
- A coherent complete and plausible general equilibrium view.  
- Why are we so focused on priced factors, alpha to last MV investor?  
- *Unpriced* factors, pervasive, correlated with outside income are more interesting. Industry, say.  
- 401(k) avoid own industry/firm! Universities avoid hospital stocks!  
- A reason for tailored portfolios, fees?  

[Fidelity ad]
Macro-finance?

Recursive utility, habits, ambiguity aversion, cross-sectional risk, preference heterogeneity, rare disasters, technological growth options...

- So far, (mostly) no portfolio implications. Add heterogeneity.
- Habits?
  - Time varying risk aversion just offsets asset price fun. Mirror?
- Rare disasters?
  - Statistics are hopeless. Economics is more important!
  - Risk management. Stress testing.
- Heterogeneity
  - Models have portfolio implications. True? Should be true?
Trading and liquidity

Purpose: Markets serve to facilitate “information trading,” speculation. Heterogeneity by information, speculate vs. long-term investor
Portfolio implications for long-term investor?

▶ Yes, as trading & liquidity affects prices.
▶ If securities are overpriced due to trading or liquidity, avoid. How?
▶ Money vs. bonds
▶ On the run, other spreads
▶ Treasury liquidity value. 20+ AAA=2.6%. 30-year Treasurys=1.7%. Not 0.9 %. 2.6/1.7 = 53% better!
▶ What if spread widens? Look in the mirror. (You, universities!)
▶ “Information trading” speculation drives up prices. traders hold for short periods, don’t care about “overpricing.” 3com/Palm
▶ Pervasive strong correlation between high prices and trading volume.
Trading and liquidity

Pervasive strong correlation between high prices and trading volume.

\[
\ln \left( \frac{ME}{BE} \right)_i = a + b \ln \left( \frac{\text{share volume}}{\text{shares outstanding}} \right)_i + \varepsilon_i.
\]

<table>
<thead>
<tr>
<th>Sample</th>
<th>a</th>
<th>b</th>
<th>OLS t</th>
<th>FM t</th>
<th>(R^2)</th>
<th>(\rho)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All CRSP 1996-2000 (averages)</td>
<td>0.83</td>
<td>0.21</td>
<td>18</td>
<td>7.5</td>
<td>0.06</td>
<td>0.24</td>
</tr>
<tr>
<td>NASDAQ 1996-2000 (averages)</td>
<td>0.85</td>
<td>0.23</td>
<td>16</td>
<td>7.2</td>
<td>0.07</td>
<td>0.27</td>
</tr>
</tbody>
</table>

- Small growth puzzle. Growth active management alpha! How much growth premium is trading convenience yield?
Trading and / vs. Liquidity

- Trading for the long term investor: avoid high M/B, high turnover, short demand (&constraints), lots of news, sexy. Tesla and Bitcoin. Value weighted index over-weights the over-priced!

- Liquidity and other stories. Liquidity: demand or supply of volume? Who is the liquidity trader? Who is the behavioral trader?
Fric tions

Institutional finance, intermediary asset pricing, slow-moving capital, supply and demand, price pressure.

▶ Potential: fund capital or leveraged constrained trading. Step around segmentation.
▶ Why no alpha? Very persistent price anomalies?
▶ Fact: opposite behavior. Liquidity demanders not suppliers. Don't like mark-to-market drawdowns that long-term investors should ignore.
▶ Heterogeneity? Look in the mirror test for all models with external supply, demand, liquidity shocks. Complete models?
▶ Implication of these views for long-term portfolios, disciplined by active management alphas?
Last words

- Huge opportunities.
- Portfolio marketing too.
- Payoff view. Buy dividends (cashflows) cheap.
- General equilibrium.
  - Average investor theorem, heuristics for avoiding bad decisions.
  - Immense progress in asset pricing theory and facts are ripe for thinking about portfolios.
- Advice
  1. Don’t pay taxes and fees needlessly
  2. Average investor theorem
  3. Tailor to an understanding of why you’re different
  4. Hedge outside income / liability stream
  5. Risk management
  6. Fees?