Portfolios for long-term investors

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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).
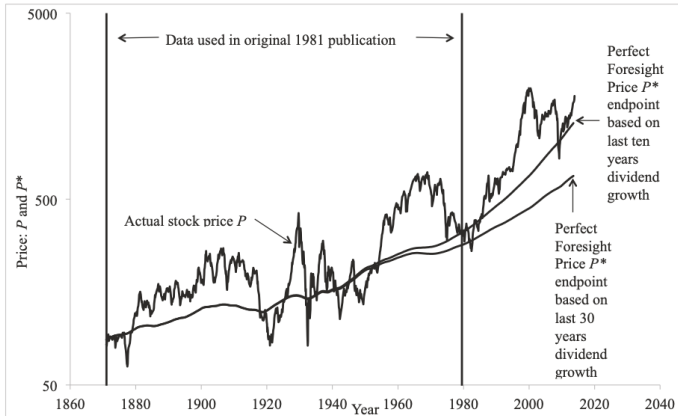
Price and ex-post dividends, discounted at a constant rate. (Shiller 2014)

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 ($E(R)$ and Σ) 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.
- ▶ How? Marking to market? Discount rate betas.
- ▶ 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 heterogenity, rare disasters, technological growth options...

- ▶ So far, (mostly) no portfolio implications. Add heterogeneity.
- ▶ Habits?
  - ▶ Time varying risk aversion just offsets asset price fun. Mirror?
  - ▶ Add heterogeneity. Debt? Universities in 2008. True habits?
- ▶ Rare disasters?
  - ▶ Statistics are hopeless. Economics is more important!
  - ▶ Risk management. Stress testing.
- ▶ Heterogenity
 - ▶ 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.
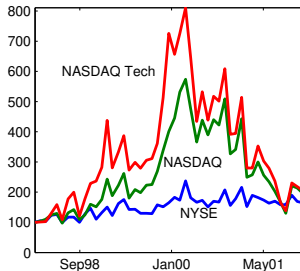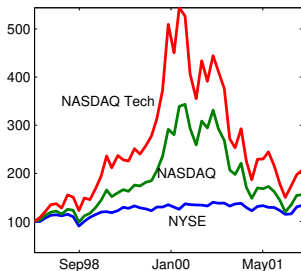
$$\ln\left(\frac{ME}{BE}\right)_i = a + b\ln\left(\frac{\text{share volume}}{\text{shares outstanding}}\right)_i + \varepsilon_i.$$

Sample	a	b	OLS t	FM t	R^2	ρ
All CRSP 1996-2000 (averages)	0.83	0.21	18	7.5	0.06	0.24
NASDAQ 1996-2000 (averages)	0.85	0.23	16	7.2	0.07	0.27

▶ 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?

Frictions

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. Dont 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?