Simple Forecasts and Paradigm Shifts

Harrison Hong and Jeremy Stein

Discussed by

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AFA-Philadelphia, Jan-08-2005
Another intriguing paper by Hong and Stein

Always interesting questions!

Behavioral finance: An engine of growth

Summary

- Simple forecasts: Multivariate true model, but update univariate models
- Paradigm shifts: If a simple model does poorly, choose another
- Results: Momentum, value, and stochastic volatility and skewness
Infinite horizon, a single asset, dividend: \[ D_t = A_t + B_t + \epsilon_t \]

Sources of public information: \[ A_t = \rho A_{t-1} + a_t; \quad B_t = \rho B_{t-1} + b_t \]

**Constant discount rate,** \( r \)

Rational benchmark valuation: \[ V_t^R = \frac{1}{1 + r - \rho} (A_{t+1} + B_{t+1}) \]

No learning — investors always use only one simple model

- Positive return autocorrelations — momentum
- Negative price-return correlation — value
- Learning — investors think either model $A$ or $B$, but never the right model

- Bayesian updating between two wrong models $A$ and $B$
  
  - Learning magnifies the value/growth effect
  
  - The growth-stock underperformance clusters after negative earnings surprises; the value-stock outperformance clusters after positive earnings surprises
  
  - More volatile returns around paradigm shifts; more negatively skewed growth-stock returns than value-stock returns

- Simple assumptions, rich predictions
The assumption of a constant discount rate seems a bit too strong.

Outline

- The importance of constant-discount-rate in the model
- Unrealistic model structure underlying constant-discount-rate
- Internal consistency
- How I would formulate the model
What does the constant-discount-rate assumption buy the authors?

Enables all the calculations based on dividend-capitalization multiples

Attributes stock return predictability to systematic mispricing \textit{only}.

\[
\begin{align*}
\underbrace{r_{t+1}}_{\text{Realized return}} &= \underbrace{E_t[r_{t+1}]}_{\text{Expected return}} + \underbrace{\varepsilon_{t+1}}_{\text{Abnormal return}}
\end{align*}
\]
Realism

- What model structures imply a constant discount rate?

- **Very** restrictive structures on the pricing kernel, $m_{t+1}$:

  $$E_t[m_{t+1}r_{t+1}] = 1 \quad \Rightarrow \quad E_t[r_{t+1}] = \frac{1}{E_t[m_{t+1}]} - \frac{\text{Cov}_t[m_{t+1}, r_{t+1}]}{E_t[m_{t+1}]}$$

  Constant $m_{t+1}$ or constant $\frac{1}{E_t[m_{t+1}]}$ and zero correlation between $m_{t+1}$ and $r_{t+1}$

- Time-varying expected return seems more natural
Consistency

- Is the Hong-Stein model internally consistent?
  - Doubtful

- Start with a constant discount rate. Then get “predictable variation in the expected returns to value and glamor stocks” (p. 25).
  - Assumptions and results are incompatible

- The analyzed scenario is very special — why don’t investors take time-varying expected returns into account?
Brandt, Zeng, and Zhang (2004): A fully-specified learning model

Dividend growth: A Markov-switching process with a hidden state

Investors update beliefs, $\pi_t$, using Bayesian learning and irrational learning

Optimality conditions:

$$\frac{P}{D}(\pi_t, \Delta d_t) = \beta E_t \left[ \left( \frac{D_{t+1}}{D_t} \right)^{1-1/\psi} \frac{P}{D}(\pi_{t+1}, \Delta d_{t+1}) \right]$$

Determine expected returns endogenously
Bayesian learning can generate short-term positive autocorrelation, long-term negative autocorrelation, and predictability with valuation ratios.

See also Lewellen and Shanken (2002) and Brav and Heaton (2002).

**Question**

- The Hong-Stein results are very intriguing.
- But how robust are these results to the constant-discount-rate assumption?
I believe behavioral biases are potentially important for anomalies

But so are time-varying expected returns: Berk, Green, and Naik (1999); Gomes, Kogan, and Zhang (2003); Berk and Green (2004); Carlson, Fisher, and Gi­ammarino (2004a, b); Kogan (2004); and Zhang (2004a, b)

No reason why behavioral biases cannot be analyzed in traditional framework

An integrated framework?

Essential to establish the relative importance of irrationality