Leverage and the Limits of Arbitrage Pricing: Implications for Dividend Strips and the Term Structure of Equity Risk Premia

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Summary of the Fight I

Part one: (microstructure) frictions and performance statistics

1 Frictions (measurement error and asynchronous price adjustments)
   - IID Measurement error: negative autocorrelation of returns
   - Asynchronous price adjustments: positive autocorrelation of returns
   - [BCFS, 2012] ⇒ downward bias in average simple B&H returns

2 Long-short portfolios + frictions
   - IID Measurement error: negative autocorrelation of returns
   - Asynchronous price adjustments: negative autocorrelation of returns
   - upward bias in simple returns

3 Long-short positions + high leverage + frictions
   - amplification of negative autocorrelation in returns
   - amplification of upward bias in simple returns
   - amplification of bias in higher moments of returns
Summary of the Fight II

Part two: inference about the dividend strips/ term structure

1. Binsbergen, Brandt, and Koijen (BBK) 2012
   → Build short-term dividend strips as highly leveraged position in options
   → Find a higher premium on short-term strips compared to long-term SP
   → Conclude that the EP term structure is downward-sloping
   → [though cannot statistically reject a flat structure]

2. Paper under Discussion (BCFS)
   → Applies the analysis of [microstructure] frictions to dividend strips
   → Uses high negative autocorrelation of strip returns as diagnostic tool
   → Hypothesize that microstructure frictions can explain BBK results
   → Shows that short-term (monthly) simple returns are biased upwards
   → Calibrates a simple model with flat EP and frictions → BBK direction
   → Robust return measures (long-term and log) to play down BBK results
Answer of Binsbergen and Koijen to BCFS

- “Misunderstanding of the available empirical evidence”
- Annual B&H excess return: $8.35\% \rightarrow 5.37\% \rightarrow 2.75\%$
- Benchmark to reject is the upward-sloping EP, and not the flat one!
- Dividend futures give about the same results as synthetic strips
- Results are robust to European and Japanese markets
- However, statistically, the EP for different horizons are not different
Truth?
Part one: (microstructure) frictions and performance statistics

Math looks correct

⇒ ASSUMING

1. asynchronous reaction of option prices to fundamentals
2. high leverage
3. long-short positions

⇒ GET

1. very negative autocorrelation of returns
2. inflated (biased) simple average returns
3. inflated (biased) variance
4. lower (biased) market beta
Part two: inference about the dividend strips/term structure

$H_0$: Short asset returns are biased, and EP is not downward-sloping

1. Diagnostics [negative autocorrelation] is consistent with $H_0$: ✓

2. Model with [random] price asynchronicity and measurement error ✓
   - matches mean returns
   - matches autocorrelations
   - matches excess volatility
   - matches CAPM beta
   - with flat real EP assumption matches downward-sloping observed EP
3 New estimates of the dividend term premium ⇒ inferences
   → With noise-robust long-term returns $R_2 - S&P \approx 0.21\%$ per month
   → Most action is in the first half of the sample with higher frictions
   → Term structure of EP is still downward-sloping [from point estimates]
   → Fail to reject the flat term structure

BUT

Correct $H_0$: Short asset returns are biased, and EP is upward-sloping
   → Would most probably reject the joint $H_0$

4 Small technical comment
   → Assumption about one futures being on average more informative
Think about trading/other frictions

Transaction costs/ margin requirements
→ Bid-ask spread for Dec-2013 options now [17-Aug-2012!] was \( \approx 25 \) bp
→ Exchange fee for 1 contract is $0.44 (neglect) + broker fee (neglect?)
→ Margin for calendar spreads is very small (neglect?)

Taxes
→ Index investment: CGT of 15%
→ Dividend strips: 60/40 Rule: 60% at 15% and 40% at ordinary rate

FINAL COUNT

The gap between short-term asset and S&P is reduced (eliminated?):
→ By 0.5-1% p.a. due to taxes
→ By 2.5-3% p.a. due to costs assuming just 5-6 bp and leverage of 50
Good luck with the paper!