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

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16-18 August 2012

European Finance Association Meeting, Copenhagen

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

Summary of the Fight III

3. Answer of Binsbergen and Koijen to BCFS
   - → "Misunderstanding of the available empirical evidence"
   - → Annual B&H excess return: $\underbrace{8.35\%}_{R_1} \rightarrow \underbrace{5.37\%}_{R_2} \rightarrow \underbrace{2.75\%}_{S\&P}$
   - → 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?

Comments/Impressions I

Part one: (microstructure) frictions and performance statistics 

Math looks correct

$\Rightarrow$ ASSUMING

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

$\Rightarrow$ GET

1. very negative autocorrelation of returns
2. inflated (biased) simple average returns
3. inflated (biased) variance
4. lower (biased) market beta

Comments/Impressions II

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

Comments/Impressions III

3. New estimates of the dividend term premium $\Rightarrow$ inferences 
   - $\rightarrow$ With noise-robust long-term returns $R_2 - S\&P \approx 0.21\%$ per month
   - $\rightarrow$ Most action is in the first half of the sample with higher frictions
   - $\rightarrow$ Term structure of EP is still downward-sloping [from point estimates]
   - $\rightarrow$ Fail to reject the flat term structure

   BUT

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

4. Small technical comment
   - $\rightarrow$ Assumption about one futures being on average more informative

Comments/Impressions IV

5. Think about trading/other frictions

Transaction costs/ margin requirements

→ Bid-ask spread for Dec-2013 options now [17-Aug-2012!] was ≈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

Conclusion

Good luck with the paper!