

International Asset Pricing: Evidence From Market Implied Costs of Capital

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WFA-Portland, June 2005

Review

- An application of implied costs of capital (IRRs) in the international setting
- Important determinants of the international cross-section of returns —
lagged risk premiums, return volatility, size, b/m, growth forecast, and leverage
- Careful, comprehensive, and admirable empirical work!

Punchline

- Many strong assumptions — not clear IRRs dominate average ex post returns
- Caveat — an outsider's perspective!

Outline

- IRR methodology
- The Q -model of implied cost of capital

IRR

- IRR equates discounted dividends with stock price:

$$P_t = \sum_{k=1}^{\infty} \frac{E_t[\text{FCFE}_{t+k}]}{(1 + r_e)^k}$$

where

$$\overbrace{E_t[\text{FCFE}_{t+k}]}^{\text{Expected Dividends}} = \overbrace{\text{FE}_{t+k}}^{\text{Earnings Forecasts}} \times \left(1 - \overbrace{b_{t+k}}^{\text{Plowback Rate}}\right)$$

- Assumption 1: exponential mean-reverting growth rates:

$$g_{t+k} = g_{t+k-1} \times \exp[\log(g/g_3)/(T - 1)]; \quad \text{FE}_{t+k} = \text{FE}_{t+k-1} \times (1 + g_{t+k})$$

Other parametric forms of mean-reverting?

- Assumption 2: g — world average GDP growth rate plus the average US inflation

Recall “Expected return = expected growth + expected dividend yield”

A time-varying cross-section of average/expected growth?

- Assumption 3: linearly mean-reverting plowback rates

$$b_{t+k} = b_{t+k-1} - \frac{b_2 - g/r_e}{T - 1}$$

Other parametric forms of plowback rates?

- Assumption 4: terminal value $TV_{t+T+1} = FE_{t+T+1}/r_e$, where $T = 15, 20$

Why a perpetuity form?

More Comments on IRR

- Standard errors in earnings forecasts and estimates of future plowback rates
- Quantify the standard errors for the IRR estimates?
- Then compare the standard errors with those in Fama and French (1997)
- Much harder to quantify the misspecification errors without theoretical guidance?

The Q -Model

- IRRs are based on accounting identities
- Can we use **economic** theory to compute costs of capital without betas?
- Yes!
- Zhang (2005, “Anomalies”): An implied-cost-of-capital model from the Q -theory:

$$r_{t+1} = \frac{\Pi_1(K_{t+1}, X_{t+1}) - \Phi_2(I_{t+1}, K_{t+1}) + (1 - \delta)\Phi_1(I_{t+1}, K_{t+1})}{\Phi_1(I_t, K_t)}$$

Estimate the parameters in Π and Φ from the investment Euler equation

- Covariances versus characteristics — not well-defined question

- Advantages over IRR:

1. Only need one-period-ahead earnings and investment forecasts — dynamic-programming versus infinite-horizon formulations
2. A class of specifications of Π and Φ guided by economic theory

Conclusion

- Admirable empirical piece!
- We can do a better job integrating economy theory and empirical practice
- An alternative implied-cost-of-capital model based on the Q -theory