The Cost of Capital: A Sceptic's View

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Conventional Wisdom (aka “Textbook Approach”)

Principle I

A project's cost of capital is the expected return available on a financial market investment of equal risk

Principle II

This expected return can be estimated using the Capital Asset Pricing Model (CAPM)

Features of The Textbook Approach

- Only systematic risk matters
- Systematic risk = market risk
- Cost of capital for any project is the same regardless of the firm that undertakes it

Principle I

- New project cannot alter set of available investment opportunities (Spanning)
- If it does, its introduction changes risk of existing securities
- Then cannot use these securities to infer risk of new project

Spanning

- “(Without spanning), much of what is taught on capital budgeting would go out the window.” (Martin Weingartner, Journal of Finance, 1977)
- Implication: Hope like hell that financial markets are sufficiently deep and liquid

Principle II: Non-market risk

- Only market risk matters if investors hold market portfolio
- Portfolios that differ from the market portfolio have significant non-market risk
- This risk can be related to various non-market 'factors' (APT)
- But we don't know what these factors are

Market frictions

- Project with high non-market risk can weaken the firm's financial position
- Weaker financial position can adversely affect other firm projects
- Loss of value in other projects is an additional cost of the new project
- "Only systematic risk matters" assumes financing is unconstrained and costless, i.e., frictionless markets
  - Then firm's financial position has no effect on cost of project
- Implication: The greater a firm's non-market risk, the higher the effective cost of capital

Example: Catastrophe Reinsurance

- The volatility of returns on catastrophe reinsurance are very high, but these risks are diversifiable and thus should not command a risk premium
- In 1996, Berkshire Hathaway agreed to sell $1.05 billion of reinsurance to the California Earthquake Authority
  - Probability of BH having to pay anything = 1.7%
  - Premium was $113 million (633% of the expected loss!) vs TB premium of $17.85 million

Timing Flexibility

- Most projects can be delayed and are at least partly irreversible
- Firm holds an 'option' to invest at the 'best' date
- When investment begins, firm sacrifices option
- 'Loss' of option is an additional cost of project
- More non-market risk makes option more valuable
- Implication: The greater a firm's non-market risk, the higher the effective cost of capital

Principle II: Evidence

- Firms hedge
- Firms seem to use discount rates far exceeding the CAPM rate.
- Internal control premium?
  - Not supported by survey evidence
  - Why not adjust cash flows back down?
  - Unsustainable equilibrium

The CAPM

- CAPM can only explain at most 11% of variation in NZ stock returns
- "Relying on the CAPM ... for cost of capital calculations ... is dubious." (Bartholdy et al, 1997)

Beta

- Betas reflect common variation in cashflows?
- “Lone prospectors in search of gold look forward to extremely uncertain future earnings, but whether they strike it rich is not likely to depend on the performance of the market portfolio Therefore, an investment in gold has a high standard deviation but a relatively low beta.” (Brealey and Myers, 1991)
- Ignores common variation in expected returns (discount rates)
- So have two sources of beta, each with different premium
- Two-beta model works better

Market Risk Premium

- Historical averaging unlikely to be consistent with CAPM pricing process
- More general model (CCAPM) gives very low estimates of equity premium
- But “You cannot adopt the CAPM on the belief that the (CCAPM) is wrong. If you think the (CCAPM) is fundamentally wrong, the economic justification for the CAPM evaporates as well.” (Cochrane, 2001)

Conclusion

- Textbook model only a starting point
- But still searching for practical extensions in most areas