Public Sector Cost of Capital and Discount Rates

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Outline

- Role of Cost of Capital
- Some Recent Issues
- Approaches to the Social Discount rate
  - International and Australia
- The Discounting Dilemma:
  - Tax, Risk and Term
- GTE Cost of Capital
  - Alternative approaches, estimation

Public Sector Cost of Capital Uses

- Departmental cost-benefit analysis of projects
  - Including competing projects
- Government Owned Trading Enterprises
  - Project evaluation
- Pricing decisions
- Performance evaluation
- Financing Choices (Capital Structure)
- Public Sector Comparator (PSC) in PPPs

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Discount Rate Importance

- Discounting of future benefits (or costs) is required to assess the merits of any investment project.
  - For private sector projects, “relatively” straight-forward market-based identification of cost of capital required
    - But the counterfactual is important
      - Real options approach
    - Real v nominal and tax considerations
      - No simple link between real pre tax and nominal post tax discount rates
  - But how to determine an appropriate discount rate for government projects?

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"While everyone agrees that the choice of discount rate is a crucial determinant of the value of public projects, there is less agreement on the appropriate discount rate to use to calculate present value. Academics, cost-benefit guides and textbooks give widely conflicting advice."

Mark Harrison *Valuing the Future: the social discount rate in cost-benefit analysis* Productivity Commission, April 2010

Two Topics

- Guidance for Government Departments in evaluating non-commercial projects
  – The real social discount rate
- Determination of cost of capital for Government Trading Enterprises
  – WACC etc

Some Recent Issues

- Garnaut Report on climate change
  - Real discount rate of 1.35 and 1.65 % p.a.
  - (Stern Report used 1.4% (real))

"The discount rate may be considered positively, based on actual market interest rates, or normatively, based on judgements about the relative values of the welfare of present and future people" (Garnaut Review update 2011)

Some Recent Issues

- NBN Co. Implementation Study
  - IRR greater than Government borrowing costs
    - Project viable / warranted, but
  - Commercial decisions should be based on equivalent private sector WACC
- Proposed Access Undertaking (Sept 2012)
  - r_f +350bp for first 10 years
  - Standard WACC calculation thereafter

Real Social Discount Rates: Some International Approaches

- USA (OMB): 7% - check sensitivity using 3%
- UK (Green Book): 3.5% declining with maturity
- France:4% declining with maturity
- Germany: 3%
- Norway: 3.5%
- EU (European Commission); Italy 5%
- NZ: Canada: China; Sth Africa: 8%
- World Bank; ADB; EBRD: 10-12%
- India: Pakistan: 12%

Source: Productivity Commission (2010); Gollier (2011)

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Australia

- OBPR: 7%
- NSW Treasury: 7% (test 4% and 10%)
- VCEC; Vic Treasury: real risk free rate 3.5% plus risk premium (real pre-tax rate of 8% for competitive neutrality)
- SA Treasury 5%
- Tas Treasury: LT Govt Bond rate +1%
- Some no longer mandate a rate
  – Dept of Finance & Deregulation: was 8%
  – Qld Treasury: was 6%

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The Discounting Dilemma

- Three main issues vis a vis private sector
  - Taxation breaks the link between the social rate of time preference (the discount rate for a risk free project) and market interest rates
  - Government risk absorption capacity (and thus risk adjustment of discount rate) may differ
  - Discounting "devalues" rights of future generations

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The Discounting Dilemma - Tax

- The Tax Effect – a simple example
- Individuals discount future cash flows at 10% p.a., have a tax rate of 33.33 per cent
- One-period private projects have to generate 15 % pre-tax return to be viable

$$NPV = (100 + 15(2/3)) / (1 + .10) - 100 = 0$$

- From society's perspective a 10 per cent return (Social Time Preference (STP) rate) is sufficient (ignoring economic growth – see later)!
- But: if private projects are required to earn 15% plus, why take on a 10% govt. project rather than a private project currently rejected which would earn say 13%? Leads to Social Opportunity Cost (SOC) perspective

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The Discounting Dilemma - Tax

- Risk free rate observed in market equates after tax return on risk free investments with before tax return to savers.
  - below pre-tax return on private risk free investments (SOC)
  - above after-tax return to saving (STP)
- "Ramsey" equation: real STP = a+bg ;
  - a = pure time preference; g = real growth rate; b = adjustment for inter-temporal uncertainty
    - "2,2,2 rule" (for a,g,b) implies 6% real discount rate

The Discounting Dilemma - Tax

- Social Opportunity Cost calculation
  - Real return to capital (historical national accounts basis) around 9 per cent (but includes risk premium)
  - Arguably consistent with real equity market return: $r_m = r_f$+MRP
    - Real bond rate: e.g. 3%
    - MRP: 6%

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The Discounting Dilemma - Risk

- Private sector: risk adjust discount rates for systematic risk ($r_f + \beta$*Market Risk Premium)
- Government: taxing power enables spreading of risk – but correlation of project outcomes with business cycle (aggregate consumption) implies risk exposure
  - But using MRP adjustment faces problem of MRP "puzzle" - MRP is much too high to be consistent with underlying theory!
- A long – debated issue

The Discounting Dilemma – The Long Term

- Discounting means that trivial weight is given to consequences beyond 15 or so years
- Different discount rates for short and long term feasible
  - No consensus but allowing discount rate to decline towards zero as maturity increases has some support
- If different generations treated equally (no pure time preference), is there any argument for positive discount rate?
  - Higher future income levels
  - probability of extinction?

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Competition Policy and Commercial Enterprises

- National Competition Principles / Access Pricing
  - Equivalent to private sector WACC
    - But which WACC (real v nominal, pre v post tax)
- Productivity Commission (1996)
  - nominal, pre-tax targets
  - fully effective dividend imputation as a sound working assumption for GTEs.

Competition Policy and Commercial Enterprises

- Qld Treasury (Feb 2006)
  - GOC's (non access regulated) are required
  - "to calculate a post-tax WACC"
  - "to use a value of 0 for gamma in calculating WACC"
  - "to calculate WACC in nominal terms"
- NSW Treasury (July 2007)
  - "discounting factor to be applied to the after-tax nominal cash flows".
  - the cost of capital formula be adjusted for dividend imputation …A value of 0.5 is recommended
- Commonwealth Dept of Finance and Deregulation (2011)
  - earn at least a commercial rate of return
- Access Pricing – mix of approaches

Which WACC?

- Variety of approaches for commercial enterprises
  - Nominal post-tax v real pre-tax framework
  - Real pre-tax cash flows easier to estimate
    - But some are taxable, some not
    - Calculating real pre-tax discount rate difficult
      - As is nominal post-tax rate (CAPM v FF v ….)
- Some issues
  - Adjusting for imputation for GTEs?
  - Book v Market value weights?
  - accounting roe and market return differences

Conclusions

- Not much consensus on social discount rates
- General acceptance of level playing field requirement in calculating cost of capital for GTEs
  - But calculation of appropriate rate is an issue.