Lesson 23 – Public Sector Analysis

Learning Objectives

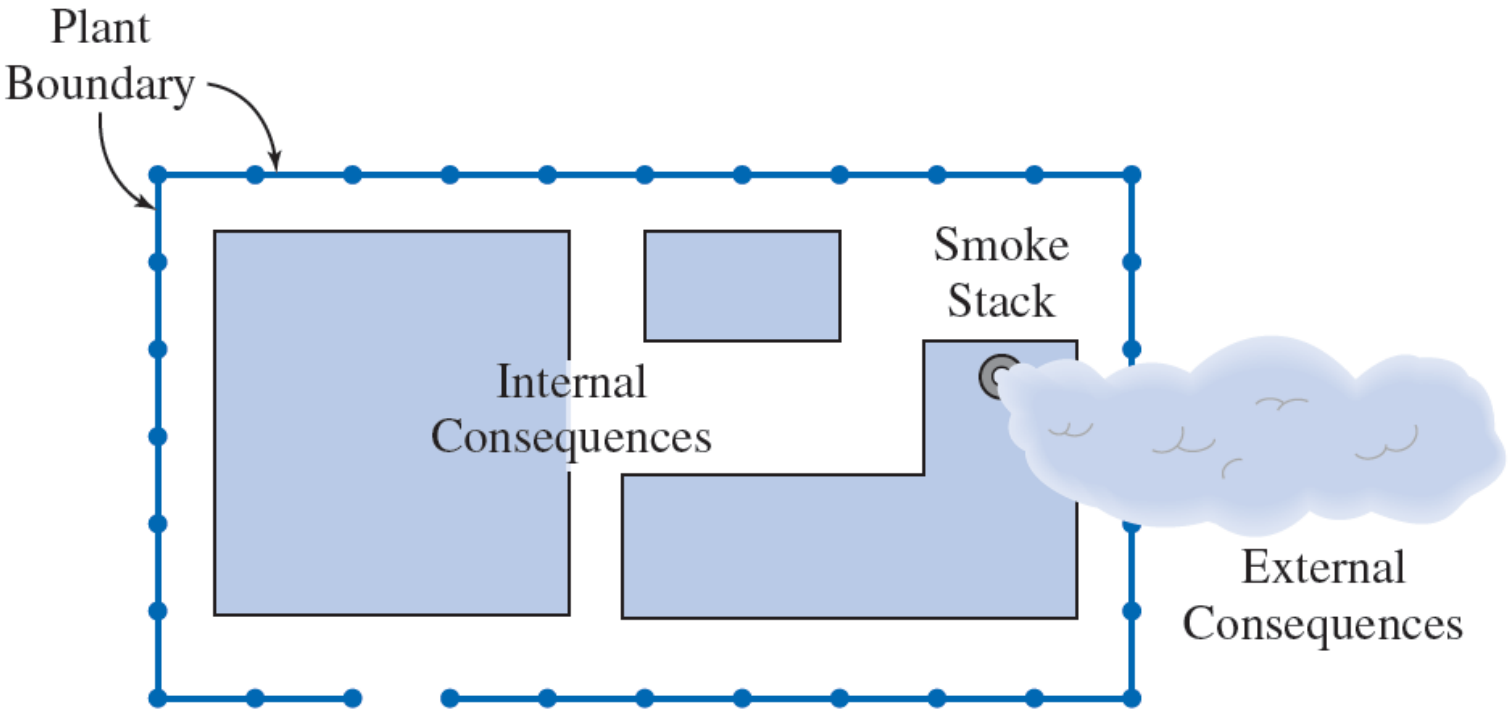
- Public decision factors
- Interest rates for public projects
- Benefit–cost ratio
- Conventional and modified B/C
- Incremental B/C
- Financing, duration, and politics of investments

Investment Objective

- Purpose of investment in public projects can sometimes be ambiguous.
- “General welfare” of society
- There are different perspectives to consider.
  - Positive and negative effects
- How do you measure benefits or consequences?
- The government answers to everyone.

Viewpoint for Analysis

- Industry viewpoint consists largely of the counting costs and benefits.
  - External consequences are typically not considered unless there is government regulation in that regard.



Viewpoint for Analysis, cont'd

- Government generally takes the viewpoint of its constituents.
  - Municipality, province, and country
- A viewpoint for any problem is to take the viewpoint at least as broad as those who pay the costs and those who receive the benefits.
  - Costs can spread across different areas and benefit local regions (bridges, etc.)
- How much influence do the different parties/constituents get?

Selecting an Interest Rate

- Setting an interest rate in the public sector is not as clear-cut as doing so in industry.
- The goal of public investment involves the use of public resources to promote the general welfare and to secure the benefits of a given project to whomsoever they may accrue, as long as those benefits outweigh the costs.

The Time-Value-of-Money Concept

- Some would argue that there is little or no time between collecting money from tax payers and spending those tax dollars.
- As such there is a 0% interest rate.

Cost of Capital

- Most levels of government borrow money in addition to collecting taxes and as such the interest rate should be the cost of borrowing money.

- Typically very cheap compared to private sector
  - Canada Savings Bonds: ~1-2.5% for last five years
  - BC Government: ~4% average

PROVINCIAL DEBT SUMMARY[1]

Forecast debt at March 31	2016/17 Budget	2016/17 Updated Forecast
Taxpayer-supported debt		
Provincial government direct operating debt	**6,215**	**5,167**
Other taxpayer-supported debt (mainly capital)		
Education	13,400	13,414
Health	7,552	7,553
Highways and public transit	12,475	12,251
Other debt	3,585	3,642
Total other taxpayer-supported debt	**37,012**	**36,860**
Total taxpayer-supported debt	**43,227**	**42,027**
Self-supported commercial Crown corporations debt	**24,113**	**24,289**
Total debt before forecast allowance	**67,340**	**66,316**
Forecast allowance	**350**	**350**
Total provincial debt	**67,690**	**66,666**
Taxpayer-supported debt-to-GDP	**16.6%**	**16.1%**
Taxpayer-supported interest bite (cents per dollar of revenue)	**3.6**	**3.2**

[1] Debt is after deduction of sinking funds and unamortized discounts, and excludes accrued interest. Government direct and fiscal agency accrue interest is reported on government's balance sheet as an accounts payable.

http://www.fin.gov.bc.ca/PT/DMB/faq.htm

http://www.csb.gc.ca/rates/

BC Municipal Finance Authority

LONG-TERM LENDING RATES

LENDING RATES: ESTIMATED 2017 SPRING ISSUE

Borrowing Terms	ESTIMATED - Spring 2017
5 Years	2.15%
10 Years **	3.00%

		ear	% Since Inception*
Municipal Finance Authority**	.14	.81	4.04
Custom Benchmark***	.05	.32	3.79
Intermediate Fund (Launched March 1994):			
Municipal Finance Authority**	.24	1.28	3.67
FTSE TMX Canada 365-Day Treasury Bill Index**	.12	.32	3.29
Bond Fund (Launched May 1989):			
Municipal Finance Authority**	.56	1.85	6.20
FTSE TMX Canada Short Term Overall Bond Index **	.51	1.28	5.92

http://mfa.bc.ca

Opportunity Cost Concept

- Two types with government:
  - Government Opportunity Cost: Opportunity cost on best opportunity foregone to government.
  - Taxpayer Opportunity Cost: Suggests that a taxpayer could have invested that money instead of paying the taxes.

Canada Pension Plan

- Before recent changes
  - Pay 4.95% on earnings up to $54,900 ($2544.30)
  - Employer matches contributions
  - Benefits prorated based on earnings over 39 years

- After tax contributions: ~$4,000 (depends on corporate tax rate) for 39 years.
- After tax benefits: $10,422 (max if taken at 65)
- If you live to 81, IRR = 0.46%

The Benefit–Cost Ratio

- Method used almost exclusively in public investment analysis:

$$B/C\ ratio = \frac{Equivalent\ worth\ of\ net\ benefits}{Equivalent\ worth\ of\ costs}$$

$$= \frac{PW\ benefits}{PW\ costs} = \frac{FW\ benefits}{FW\ costs} = \frac{AW\ benefits}{AW\ costs}$$

- B/C ratio decisions:
  - B/C ratio is > 1.0 decision should be to invest
  - B/C ratio is < 1.0 decision should be not to invest

Incremental Benefit–Cost Analysis

- For multiple alternatives, it is not proper to simply calculate the B/C ratios for each alternative.
- Incremental benefit–cost ratio method:
  - Identify all relevant alternatives (optional).
  - Calculate the B/C ratio of each alternative.
    - Ratios < 1.0 can be eliminated from further consideration
  - Rank the order of projects:
    - Smallest to largest size of denominator

Incremental Benefit–Cost Analysis, cont'd

- Incremental Benefit–Cost Ratio Method cont'd.
  - Identify increment under consideration.
    - Lowest cost to next highest cost
  - Calculate B/C for the increment.
    - Incremental costs and incremental benefits
  - Use the incremental B/C to determine which is the better alternative.
  - Iterate until all projects have been considered.
  - Select best alternative
    - Last justified alternative left

Project Financing

- Smaller projects are fully funded through taxation.
- Larger projects may require borrowing through bonds.
- P3: public–private partnership
  - Needs identified by the government, who then enters into an agreement with private industry.

Duration of Project

- Government projects often have long lives.
  - 20 to 50 years or longer (museums, highways, etc.)
- Large projects have large initial investments.
  - Long lives reduce the effect of the large investment.
- Lower interest rates reduce the capital recovery cost.
- Example 16-6:

Conventional Benefit-Cost Ratio for Various Combinations of Project Life and Interest Rate

	Interest		
Project Life (years)	3%	10%	15%
15	1.24	0.86	0.69
30	1.79	1.03	0.76
60	2.24	1.08	0.77

Quantifying and Valuing Benefits and Disbenefits

- Many projects have difficulty quantifying benefits.
  - e.g., building a school
    - $ of benefit per person? Educational outcomes?
- As a consequence of the difficulty in verifying benefits and disbenefits, different groups may quantify differently to support their positions.
- Example – measuring poverty
  - Low Income Measure
  - Low Income Cut-off

http://www.statcan.gc.ca/pub/75f0002m/2012002/lim-mfr-eng.htm

Project Politics

- Political influences have an impact on public projects.
- Competing views and political support
  - e.g., Economic development versus environmental concerns?
- Controversy
- Long term projects versus short term politicians
- The role of politics is far-reaching in public projects, as opposed to in industry projects.