



SIP/2004-WP11
Business case

Special Implementation Project

Economic Assessment

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Workshop on the development of business case for the
implementation of CNS/ATM systems
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Outline

- Macroeconomic considerations
- Basic analysis concepts
- Cost benefit analysis
- Costs and benefits for multinational arrangements

Macroeconomic considerations

Macroeconomic Issues

- Insatiable demand
- Scarcity
- Choice
- Resource allocation
- Social welfare

Trends in macroeconomic policy

- The objective is to improve social welfare
- Through sustained economic growth
- Avoidance of recessions & downturns
- Fighting high taxes and inflation
- Eliminate or reduce budget deficit
- Small government

Concept of a Public Service

➤ Definition varies:

- ✓ Geographically
- ✓ Over time

➤ A service that is considered vital to the public

- ✓ Continuous
- ✓ Accessible
- ✓ Affordable

Economic considerations for Project Analysis & Evaluation

Project Type

➤ Public

- ✓ Objective: To maximize social welfare

➤ Private

- ✓ Objective: To maximize the firm's profits

Public Project

- Does the project increase social welfare?
- Cost Benefit Analysis
 - ✓ Social benefits
 - ✓ Social costs

Costs & Benefits

- Direct & Indirect
- Tangible & Intangible
- Quantitative & Qualitative
- Fixed & Variable

Partners

- Need to identify all partners/stakeholders
- Costs and benefits identified and evaluated for each partner/stakeholder

Methods and techniques

- Cost benefit analysis
- Cost effectiveness analysis
- Least cost approach
- Pay-off period
- Snapshot approach
- Value analysis
- Others

Basic analysis concepts

Discounting Concept

- A project lifetime spans over a long period
- Money is worth more today than tomorrow
- Costs & benefits are estimated in present value terms
- The discounting concept

Discounting Concept

➤ Example:

- ✓ Suppose that for you, one dollar today is worth 1.1 dollar next year.
- ✓ The discount rate to be used is 10 per cent
- ✓ Suppose you get a loan of 1000 dollars today and and you reimburse it in 3 yearly payments of 400 dollars
- ✓ For you the present value of the first 400 is $400 / 1.1 = 363.64$; Whereas the present of the second 400 is $400 / (1.1)^2 = 330.58$ and the present value of the third 400 is $400 / (1.1)^3 = 300.53$
- ✓ Therefore the present value of the money you will repay is $363.64 + 330.58 + 300.53 = 994.74$
- ✓ If you accept the loan, you will gain 5.26 of today's dollars

Discounting Concept

➤ In General:

- ✓ The present value of an amount A regularly paid during N periods is given by the formula below:
- ✓ $PV = A/(1+r) + A/(1+r)^2 + A/(1+r)^3 + \dots + A/(1+r)^N$
- ✓ Where r is the discount rate

Discount Rates

- Social discount rate
- Private discount rate

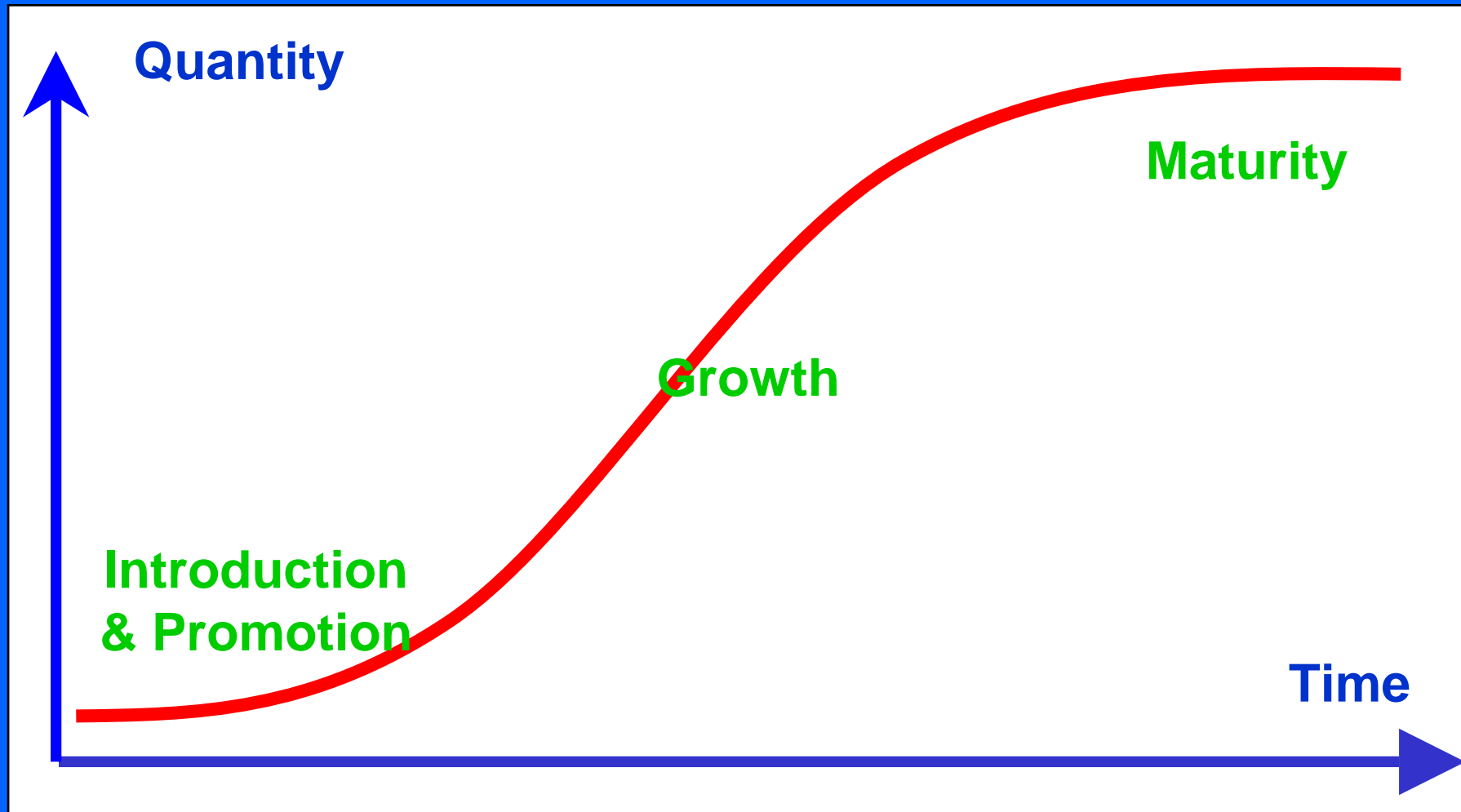
Discount/interest rate

- Interest rate is related to the marginal productivity of capital in the country
- Interest rate might be related to the real long term government bond rate plus a risk premium
- Governments might have an agreed discount rate to apply to public projects

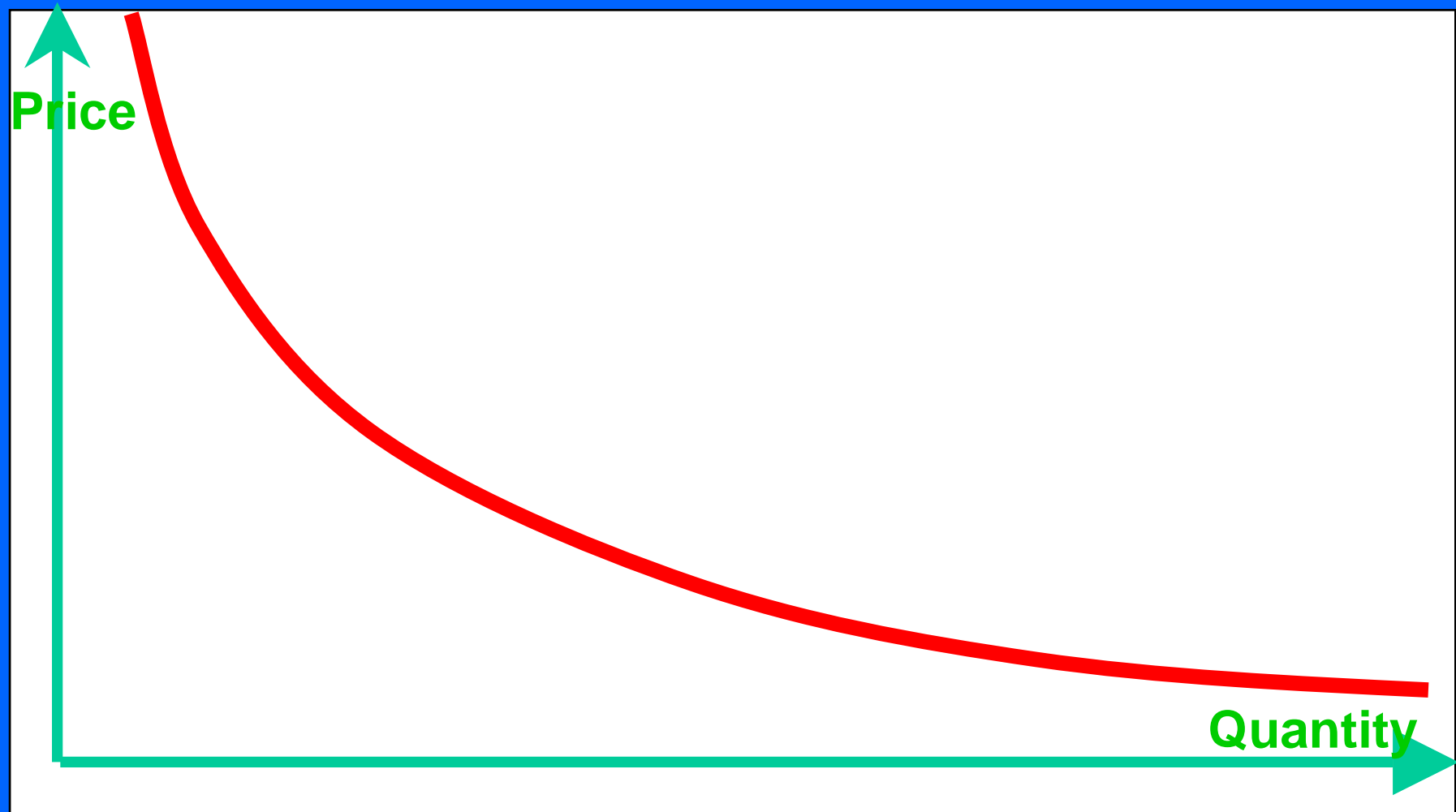
Price changes

- How are price changes treated in a CBA?
- Cost & benefits are most of the time used in constant terms (excluding the effect of price changes)
- The interest rate used for the analysis has also to exclude the effect of price changes
- Real interest rate = Nominal interest rate - Rate of inflation

Product Life Cycle



Demand Curve



Cost Benefit Analysis

Objectives of Cost/Benefit Analysis

- Forecast Economic Performance
- Compare Implementation Options
- Guidance on Timing

€ Taxable Interest
€ State Tax Federal Tax
\$
Withholding
€ IRA

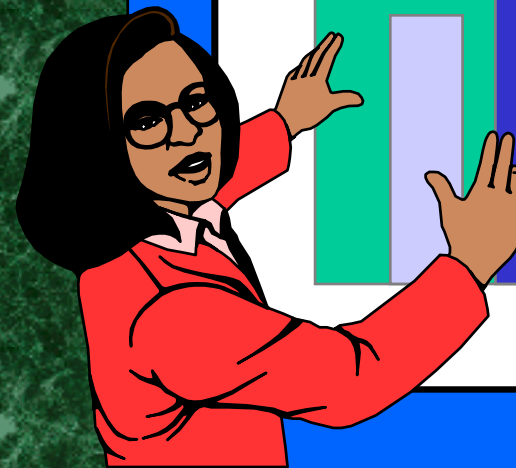


Uses of cost benefit analysis

- Gives an indication of the total economic welfare effects of a project;
- Covers all costs and benefits, both quantitative and qualitative including external costs;
- May serve for the financial analysis which has a narrower scope

Dimensions of System Performance

- Cost
- Capacity
- Safety
- Reliability
- Environmental



Project Case

New Investment
CNS/ATM system

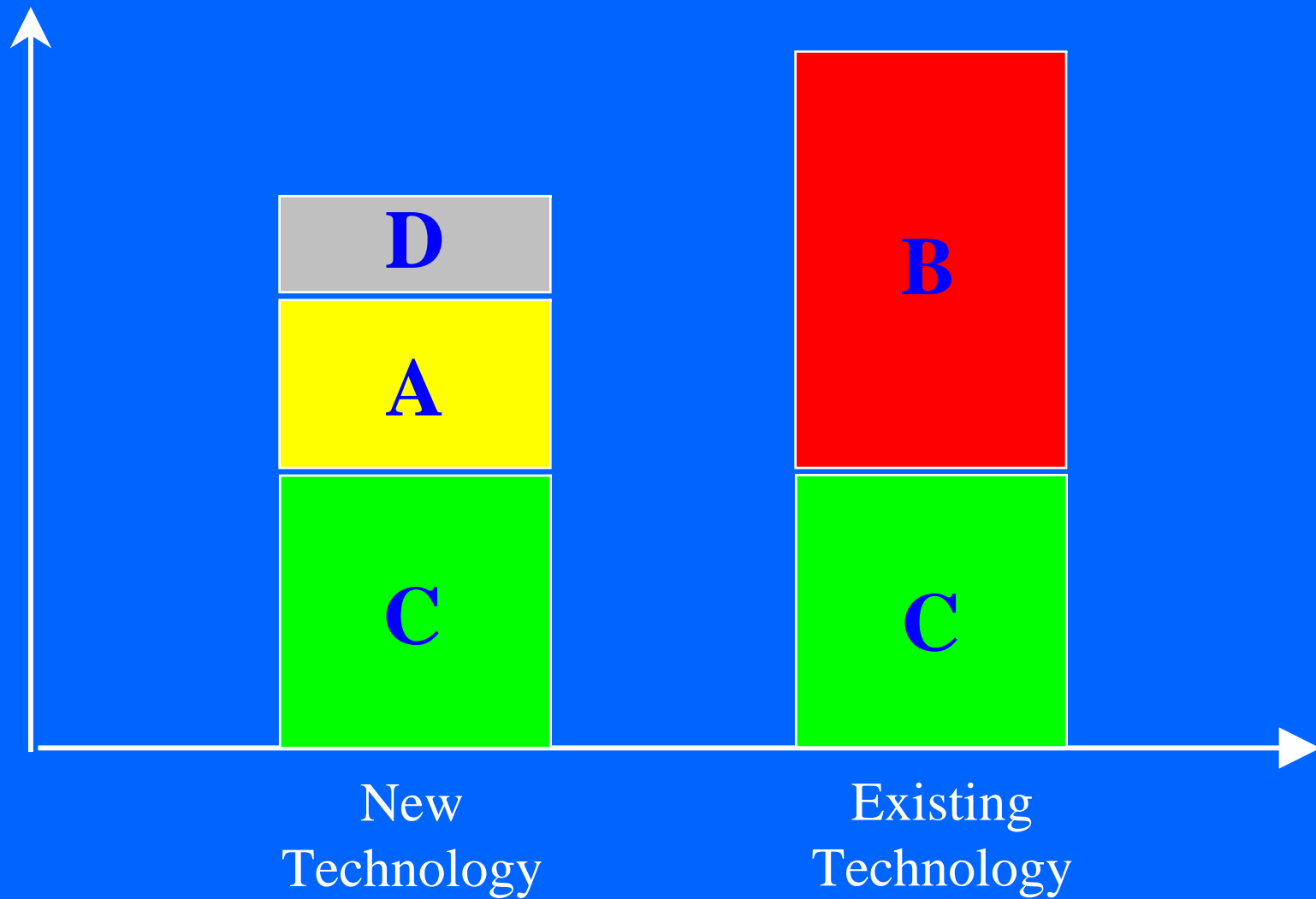
Base Case

Replacement Investment
Existing System

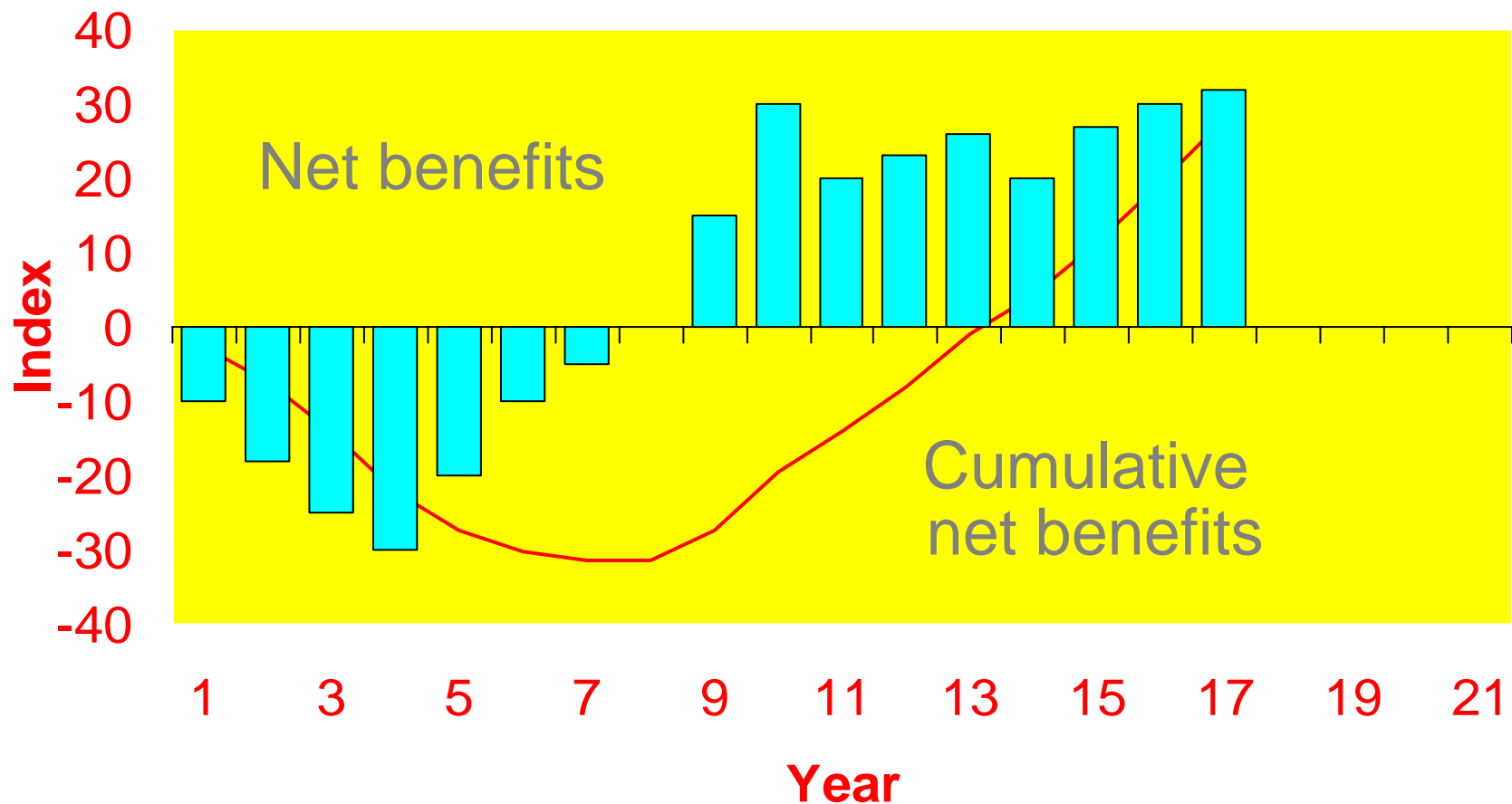
Incremental costs & benefits

- Costs & benefits incurred only in the project case scenario or the base case scenario
- Alternative: Total Cost analysis
- To avoid redundancy
- To simplify the analysis

Incremental costs



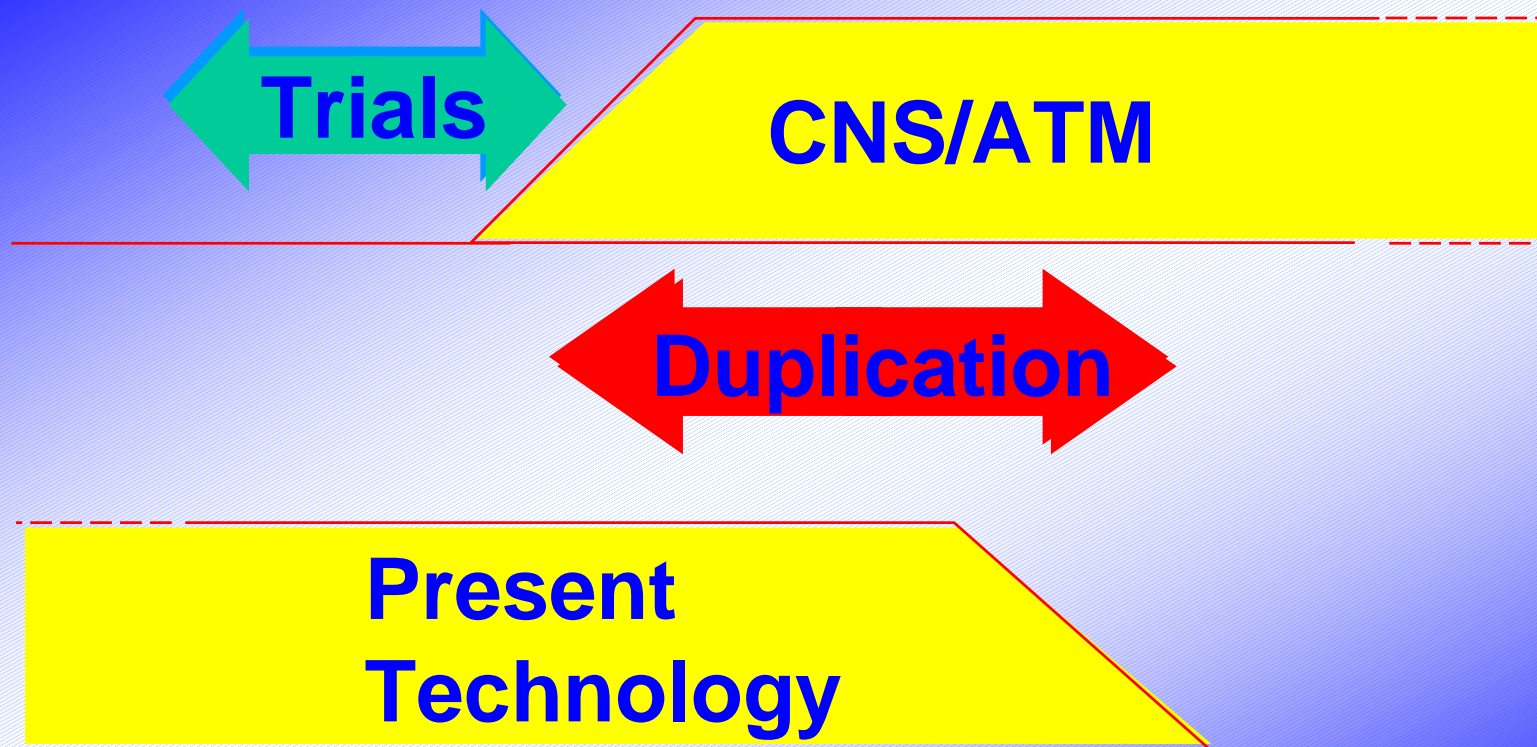
Net Benefits and Cumulative Net Benefits of CNS/ATM



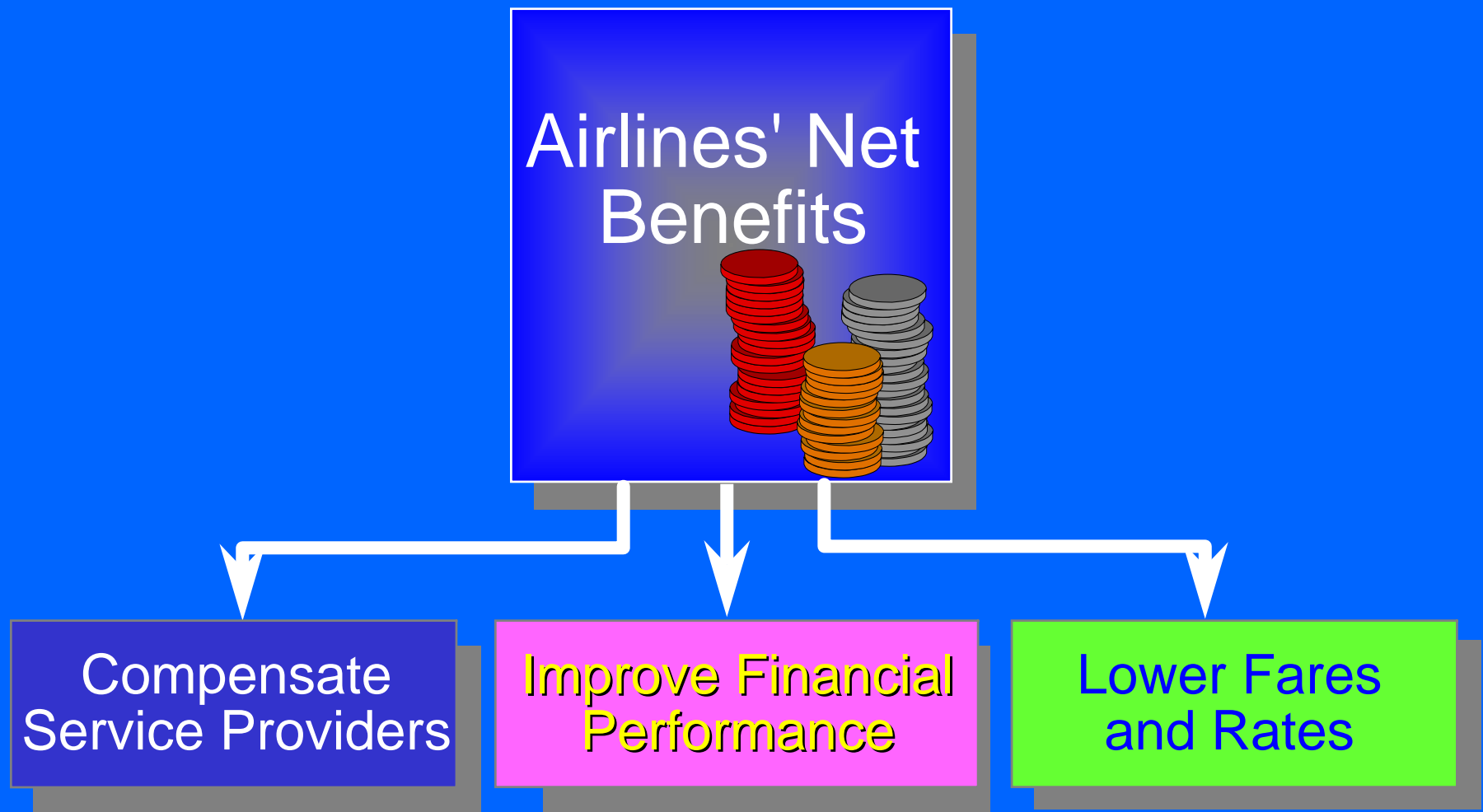
Measures of Economic Viability

- Benefit/Cost Ratio
- Net Present Value
- Rate of Return

Possible Transition Scenario



Distribution of Benefits



Costs and benefits for multinational arrangements

Main benefits of multinational arrangements

- Sharing of costs and elimination of redundancies, including:
 - ✓ the cost savings associated with the possible reduction of personnel at the national level;
 - ✓ the avoided costs resulting from the non replacement of old facilities and equipment at the national level;
- Provision of services otherwise impossible to provide by a single State

Main benefits of multinational arrangements

- The provision of a better service to the airspace users which might lead them to make additional cost savings through more efficient routings
- The more effective collection of user charges

Main costs of multinational arrangements

- Costs of the study of the various multinational arrangements (legal, technical, organizational, financial, etc.) to allow for a substantiated selection
- Implementation costs (acquisition and installation of facilities and equipment)
- Recruitment and training costs for the new personnel
- Operations costs of the multinational system

Main costs of multinational arrangements

- Maintenance costs for the new facilities and equipment
- Possible restructuring costs for the national provider
- Possible additional coordination work with partner States
- Decommissioning of old facilities and equipment at the national level

Main economic and financial issues for multinational arrangement

- The financial viability of the multinational venture
- The choice of the currency to be used for the budgeting and accounting of the multinational venture
- The provision of funds to set up the multinational arrangement and the cost sharing scheme
- The use of loans and other financing alternatives to fund the implementation of the multinational venture

Main economic and financial issues for multinational arrangement

- Loans might be more difficult to obtain if the borrower is a multinational venture (institution or organization) in its initial phases
- The cost recovery policy and the sharing of revenues when their generation through user charges is initiated
- The possible loss of direct revenues to the State
- The handling of possible future cash deficits of the multinational venture and the guaranties to the continued provision of services

