Methods of economic evaluation

Outline

- The essence of economic evaluation, history of project evaluation.

- Inputs and outputs. Typology. Relevance for the use of specific evaluation methods. Evaluation criteria – economy, effectiveness, efficiency

- Single crierion methods (CMA, CEA, CUA, CBA)

- CBA, basic principle and selected problems (valuation, discounting)

- Ways to select the "best" project

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The essence of economic analysis/evaluation

= (some) relationship between inputs and outputs

It can take many forms (net utility, profitability...)

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History

USA

- 1902 - River and Harbor Act

- Methods of analysis of public projects were generalized in the period of the "New Deal"

- 1950 the principles and rules associated with the evaluation of projects of various water reservoirs were established

- Of greater scope after the Second World War, when the general principles associated with the evaluation of water reservoir projects were enshrined in the "Green Paper" published in 1950.

- During the 50s to 80s of the 20th century, numerous works began to appear in this area, the most important authors of which were mainly R. Dorfman, O. Eckstein, J. Margolis, J. Krutilla and B. Weisbrod.

- 1961 The Planning-Programming-Budgeting System (PPBS) was created as a cost-benefit evaluation procedure. PPBS was followed by the Zero-Based Budeting method in the 70s of the 20th century

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History

Evrope

Great Britain

☐focus mainly on transport, urban and elektricity

☐France

☐focus on large energy companies and transport.

☐In the 70s of the 20th century, the issue of externalities due to increasing problems from the environment and its pollution.

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Inputs, outputs, results and effects

(Do you remember? Filip covered it last time.)

| Costs	Output	Outcome	Impact
• all resources used to produce the planned outputs, results and effects • measured by quantitative, financial or non-financial indicators	• goods or services created through inputs (measured as inputs)	• evaluates what has been achieved through inputs	• evaluates the results from a long-term perspective • defines the evaluation of specific changes in the socio-economic environment

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Types of inputs/costs and outputs/benefits

real   pecuniary

They reflect an increase in the well-being of society, which is compared to the real cost of transferring a resource from another use

- direct x indirect
- tangible x intangible
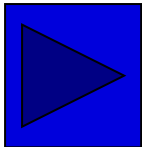
They arise as a result of changes in relative prices, which are reflected in the adaptation of the economy to the public goods provided and to changes in the structure of demand for resources.

As a result, the profits or losses of some individuals increase, but they are offset by losses or gains felt by others.

tangible x intangible

Can a price be found for a given cost or utility in the market??

Tangible

the price can be found on the markets
(saved gasoline, increased amount of transported goods)

Intangible

the price can not be found on the market (lives saved, leisure time, improvement of the quality of the environment)

Types of economic evaluation

☐ The pursuit of efficiency requires priority to be given to those projects which provide the greatest benefit per unit of cost. Although economic evaluations approach costs in a common format, they differ in the way they approach benefits. These differences play a critical role in developing criteria for efficiency

☐ Cost minimalization analysis (CMA)

☐ Cost effectiveness analysis (CEA)

☐ Cost utility analysis (CUA)

☐ Cost-benefit analysis (CBA)

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Some other concepts

Data envelope analysis (DEA)

Social return on investment (SROI) - method for measuring extra-financial value (such as environmental or social value not currently reflected or involved in conventional financial accounts).

Value for Money - Value for money is not synonymous with either economy (i.e. reducing the cost of inputs) or efficiency. Value for money is about finding the right balance between economy, efficiency and effectiveness, and cannot be assessed through only one of these dimensions in isolation.

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Cost Benefit Analysis

- involves measuring costs and benefits in commensurate terms, usually monetary.
- Cost benefit analysis makes it possible to determine, firstly, whether a policy offers an overall net welfare gain and, secondly, how the welfare gain from that policy compares with that from alternative ones.
- By valuing all costs and benefits in the same units, cost benefit analysis compares diverse policies using the net benefit criterion. Cost benefit analysis thus simultaneously addresses issues of productive and allocative efficiency.

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We're right in the middle of the presentation now.

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CBA's main steps

Step 1   ☐Identification of a set of possible projects that can be considered

Step 2   ☐Identification of all meanings of these projects (all their inputs and outputs, including opportunity costs)

Step 3   ☐Estimation of the price of individual inputs and outputs – including the valuation of "intangible" items + so-called price rectification
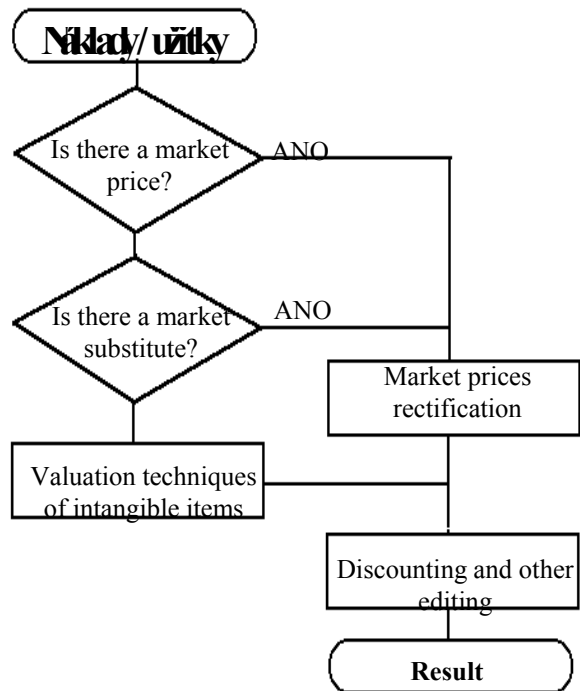
Step 4   ☐Converting all prices to the current discounted value (including solving the problem of the discount rate used)

Step 5   ☐Summing up all costs and benefits of individual projects – determination of social profitability (analogy of ROI), calculation and comparison of net benefits - > basis for the selection decision

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The key issues:

☐ the problem of finding prices of ALL benefits and costs (intangible ones, shadow pricing, external costs & benefits…);

☐ the problem of including the time factor (the issue of the discount rate).

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Náklady/užitky

Is there a market price? — ANO

Is there a market substitute? — ANO

Market prices rectification

Valuation techniques of intangible items

Discounting and other editing

Result

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Assigning money values to intangible C/Bs

❑ Using preferences (Willingness to pay/accept)

Either it is based on preferences already revealed in related markets (related market valuations);

Or it reveals (examines) people's preferences from what they themselves say they are willing to pay or tolerate.(Contingent valuation)

❑ Other than preference-based

☐ Method of procurement costs

☐ Method of averting costs

☐ other (compensation precedents)

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Market prices rectification („correction")

☐ *Shadow prices* as a result of adjustment.

Possible causes of distortion of market prices:

☐imperfect competition

☐incomplete use of resources

☐taxes, subsidies and public regulations

☐external trade and financial protection

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The issue of comparability of the time aspect

☐Costs and benefits tend to be staggered. To ensure the commensurability and comparability of all costs and benefits, it is necessary to relate their value to a single date.

If we recalculate the value of a future cost or utility to the present, we must discount it by means of a formula:

$$PV = FV / (1+i)^n$$

Analogically present to future**: FV = PV * (1+ i)^n**

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The main issue here is the selection of an appropriate discount rate.

As the discount rate decreases, the present value will grow more if the period during which the pension flows is longer. On the contrary, increasing the discount rate favors relatively short-term investments.

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Projekty	X	Y	Z	
náklady(C)	12500	12500	12500	
roční užitky	3000	1300	985	
doba využití	5	15	25	
celkem	*15000*	*19500*	*24625*	
Současná hodnota budoucích užitků				
použitá diskontní sazba (i)				
2%	14140	16704	19231	
4%	13355	14454	15388	
6%	12637	12626	12592	
8%	11978	11127	10515	
10%	11372	9888	8941	
12%	10814	8854	7725	
14%	10299	7985	6770	
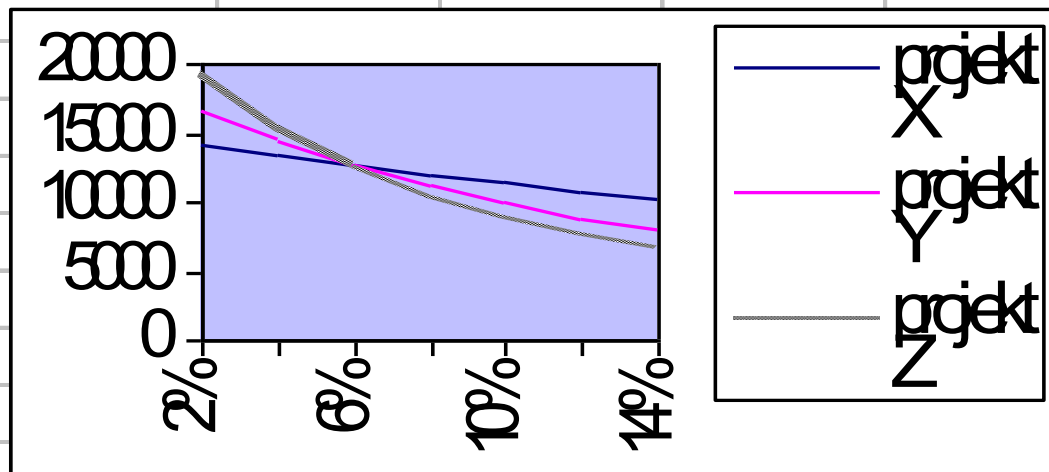
Private vs. Social Discount Rate

- Existing financial products, comparable payback/lifespan, comparable risk.

- We are looking for the ratio between current and future consumption that private consumers have.

-

☐ There are also reasons for arbitrarily modifying the update discount rate in both directions, e.g.:

☐ short-sighted preference for current consumption (=> lower rate)

☐ government – a guardian of the well-being of future generations (dtto)

☐ the principle of equalizing the standard of living in conditions of increasing productivity work (=> higher rate)

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Project selection

☐ 4 combinations of rules related to (a) the nature of the projects (divisible x indivisible) and (b) the financing circumstances (fixed x flexible budget).

☐ Divisible – fixed budget: maximizing the sum of net benefits. Utility is maximized if the total expenditure is distributed among the individual projects in such a way that the benefits resulting from the expenditure of the last money unit for each project are equal (mathematically written $MU_X = MU_Y$).

☐

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Further reading

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☐ Robinson, R. (1993). Cost-benefit analysis. *British Medical Journal*, *307*(6909), 924-926.

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