

Public procurement evaluation – problems for practice

1. Municipality wants to purchase a new lift as a public procurement. Rank the bids.

	Price (mil. CZK)	Delivery (weeks)	Guarantee (months)	Response to problem (hours)	Aesthetics (0-5 points scale)
OTIS	1.95	9	59	4	4
KONE	1.51	12	55	7	1
SCHINDLER	1.66	11	65	5	4
Weights	67	15	20	29	18

(Solution: SCHINDLER 87.8%; OTIS 86.2%; KONE 77.4%)

2. Rank bid in a public procurement evaluation. How can you change k_2 level to make the last bid become the best? And how can you change k_3 level in case of the second best bid?

	k_1 (min)	k_2 (max)	k_3 (min)
Bid 1	22	17	22
Bid 2	8	39	25
Bid 3	22	40	20
Bid 4	14	29	20
Weights	50%	15%	35%

(Solution: ranks of bids – 1) 56.4%; 2) 92.6%; 3) 68.2%; 74.4%;

changing parameter k_2 cannot make the worst offer becoming the best;

to make 4) better than 2) by changing k_3 the 4) must lower the acquired 28% of 2) in k_3 to less than 9.82% – as it is a minimizing criterion, we need to decrease the value of parameter k_3 in case of bid 4) to $20/(28/9.82) = 7.014$ or less in order to make 4) get better score than 2))

Hedonic method – problem for practice

1. You are supposed to calculate (using hedonic method) the value of negative impact of building a new road on the houses along it. There are 50 houses in total. Price of the house is estimated as:

$$p_i = \alpha + \beta(\text{room}) + \gamma(\text{noise}) + \delta(x_i) + \varepsilon_i$$

where p_i means estimates price of the house, room amount of rooms in the house, noise level of noise from the road, and x_i some other house characteristics. Coefficients have values of $\alpha = 80$, $\beta = 30$, $\gamma = -90$ a $\delta = 1$. New road will increase noise level from originally 0.1 to 0.6.

(Solution: Value of the houses will decrease in total by $50 * (-45) = -2250$)

Deriving price from the demand curves – problem for practice

1. Prague wants to construct a new tunnel Bianca, which will improve the traffic connection between two districts. Ne tunnel will decrease the costs per trip between the districts by 50 CZK for saved fuel, by 150 CZK for saved time, and moreover drivers will be much less stressed (without appraisal). On the other hand the drivers would pay a 20 CZK toll per each trip. Assume that the fee would become revenue in the municipal budget and the drivers would only use the tunnel. Currently there are 2 million trips between the districts per year,

and with the tunnel it is estimated to increase up to 2.6 million. Calculate the total benefit of building this new tunnel for the city and for the drivers?

(Solution: annual benefit for the drivers is 414 mil. CZK, revenue for Prague is 52 mil. CZK)

TCM – problem for practice

1. Somewhere in deep woods there is an old ruin of the fortress. Local authority is deciding, whether to level it down and build there a wind power plant that would bring revenue of 10 million CZK per year. Based on the data below, using TCM estimate social benefits of the fortress and decide whether to keep the ruin or build a plant. Assume discontinuous changes in demand for visits and no visit from additional zones. Also assume the visits are one purpose only, there is nothing of interest anywhere around.

Zone	Distance	Population	Probability of visit per year	Total costs per visit
1	10	10 000	15%	50 CZK
2	30	100 000	7%	170 CZK
3	70	300 000	3%	400 CZK
4	150	1 000 000	0.5%	1 000 CZK

(Solution: Economic benefits of the ruin are 9 865 000 CZK per year, what is less than revenues from wind power plant – authority should thus build a new power plant)

WTP – problem for practice

1. Small community in town is deciding between keeping the current playground for children, and building new parking lots. Help them decide if social benefits of the playground have been evaluated by experts as 7.5 million CZK (a big one). In case of new parking lot, based on the questionnaire the demand for the first 30 parking lots is $d_1 = 1000 * (200 - 4q)$, for the rest $d_2 = 1000 * (110 - q)$. Calculate social benefits of the new parking lot using WTP method (do not consider investment costs).

(Solution: Area under the pseudo-demand curve for parking lots is only 7.4 million CZK)