

Time horizon and valuation

Case E39 Søgne-Ålgård

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E39 Søgne-Ålgård – brief introduction

- E39 between Søgne in Vest-Agder and Ålgård in Rogaland.
- 190 km long, part of the main road connecting the west coast of Norway
- Passes ten municipalities and connects the two urban regions Nord-Jæren and the Kristiansand region
- Project triggering needs:
 - Shorter travel time and more efficient transport between Nord Jæren and the Kristiansand region
 - Reduction in the frequency of serious accidents related to oncoming traffic and driving off the road

Søgne-Ålgård



Benefits and costs

- Travellers and transport users
 - Shorter travel time
 - Reduction of expected delays
- Public finances
 - Investment costs
 - Operation and maintenance costs
 - Tax income
- Benefits for the society as a whole
 - Reduced accident costs

Time horizon and valuation- starting points

- The time profile differs between the various costs and benefits
- Valuation of costs and benefits at different points of time is crucial for the profitability of a project

What affects valuation of costs and benefits in the future?

1. For how long do the benefits occur?
 - a. Evaluation period
 - b. Lifetime of the investment
2. How do we compare benefits and costs at different points in time?
 - a. Discount rate/risk equivalents
 - b. Real price adjustment
 - c. Volume growth

Evaluation period and technical lifetime

- Evaluation period
 - For how long do the benefits from the project continue?
- Technical lifetime of the investment
 - For how long do the physical facilities last, assuming the current level of maintenance?

Residual values and reinvestments

- Differences between evaluation periods and technical lifetime must be handled through reinvestments and rest values
- Evaluation period > technical lifetime
→ reinvestment
- Evaluation period < technical lifetime
→ residual value

Evaluation period and technical lifetime KVV and KS1

Assumption	KVV	KS1
Evaluation period	25 years	TS og U: 25 years V, M og F: 75 years
Technical lifetime	40 years	40 (+40) years
Rest value	Net present value of a calculated share (15/40) of the original investment, based on the number of years remaining after the evaluation period	Net present value of a calculated share (5/40) of the original investment, based on the number of years remaining after the evaluation period (close to zero)
Reinvestment	None	After 40 years

Real price adjustment

- Valuation of benefits is affected by income level
 - Real wage is used as indicator
- Different benefits and costs are affected differently
 - Handled through income elasticities

Real price adjustment KVVU og KS1

- KVVU: No real price adjustment
- KS1:
 - Real price adjustment of 1.6 per cent per year (based on official prognoses)
 - Elasticities
 - Business travel 1.0
 - Other travel 0.8
 - Environment and accidents 1.0
 - Investment, operation and maintenance costs : 1.0 (levelled out by higher productivity)

Discount rate and risk equivalents

- Depends on systematic risk
- Lower in the long term?

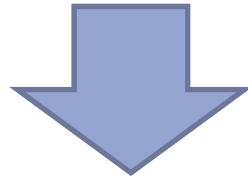
Discount rate and risk equivalents

– KVV and KS1

- KVV:
 - Discount rate 4,5 per cent
- KS1
 - Risk free rate 2,0 prosent
 - Risk premium 2,0 (time other travel)-2,5 per cent
- No time differentiation

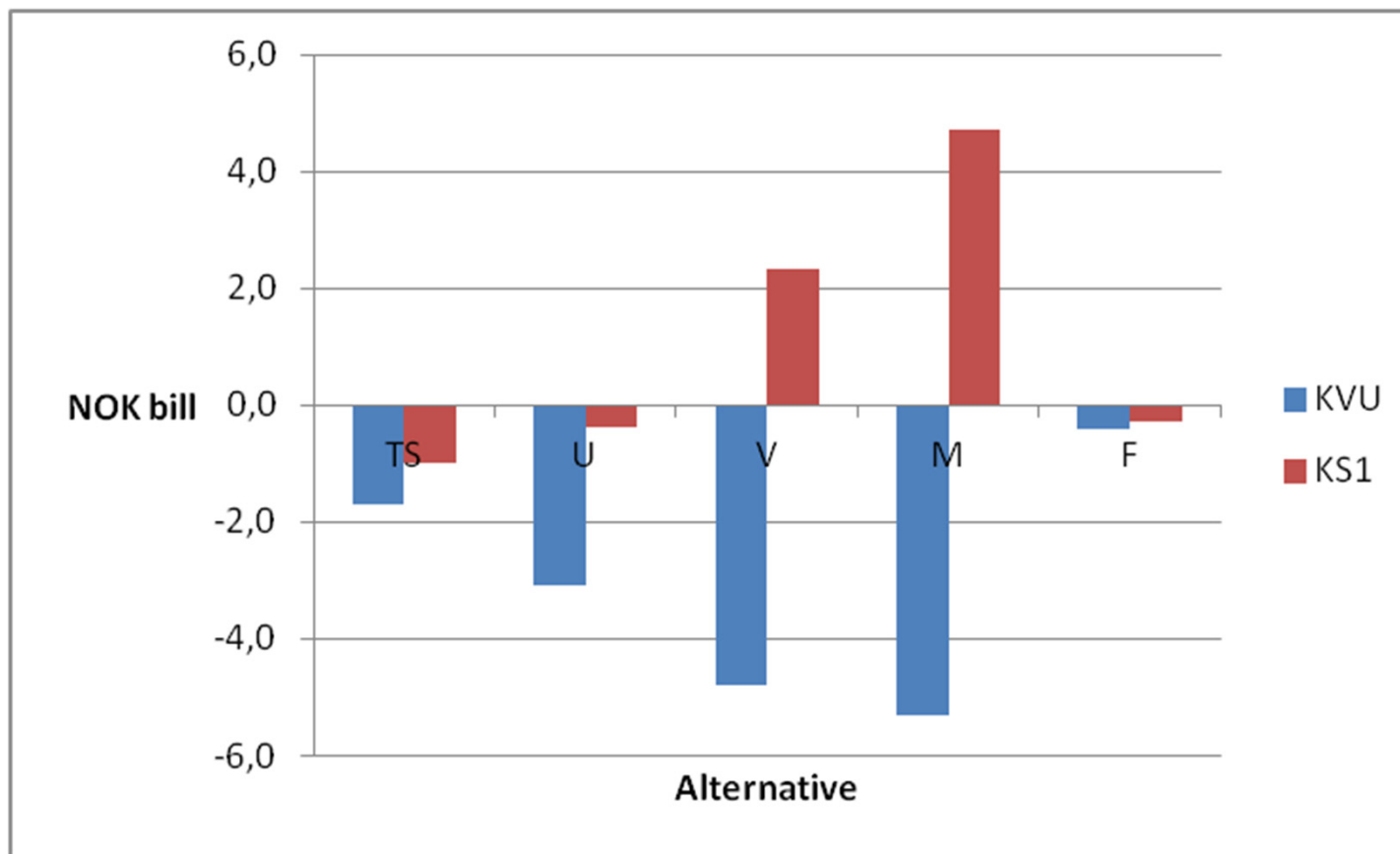
How does it affect the results ?

- Real price adjustment 1.4-1.6 per cent
- Volume growth 1 prosent
- In total on level with the risk premium

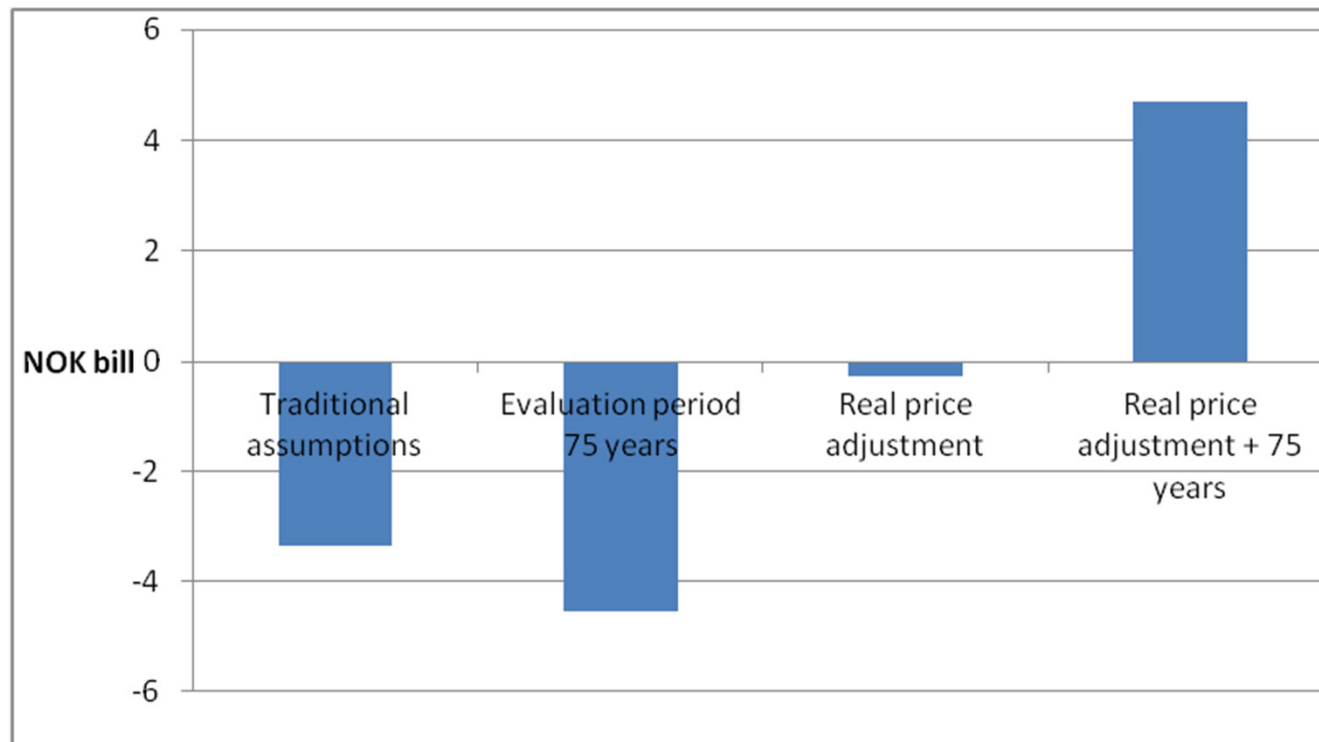


- Effective discount rate close to risk free discount rate
- The length of the evaluation period has much stronger impact than with "traditional" assumptions

NPV KVV and KS1



NPV with alternative assumptions



Concluding remarks

- Valuation of costs and benefits at different points of time is crucial for the profitability of a project
- Discount rates, real price adjustments, valuation periods and technical lifetimes are important as separate parameters
- In combination they may be project makers or killers
- These parameters are too important to (continue to) be neglected by analysts