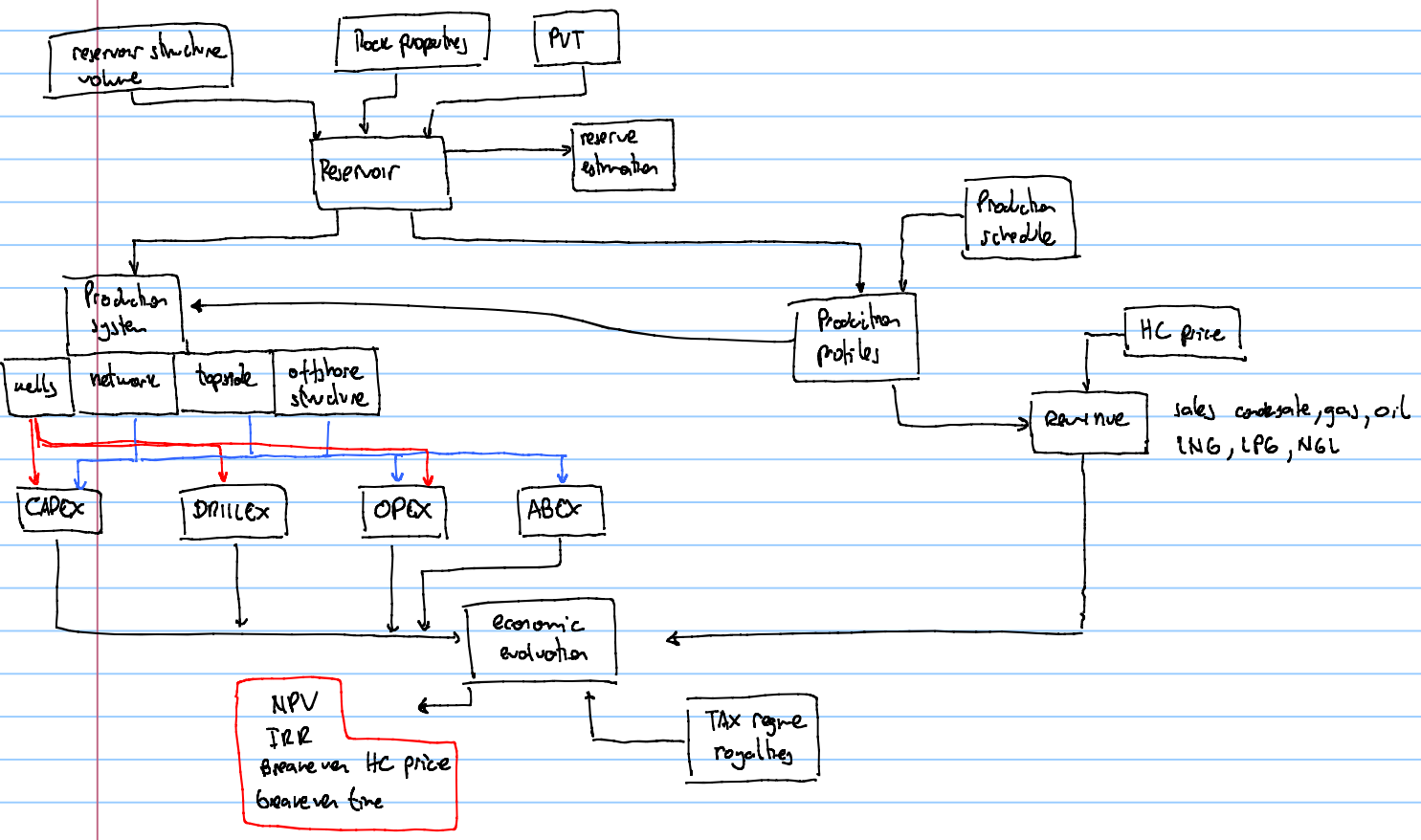
Notes for Youtube video 11

Value down model



CAPEX:
- engineering studies (salaries, consultants, contractor)
- processing facilities (separators, pumps, compressor, heat exchangers, control system, injection, export, water, oil, gas treatment)
- offshore structure (cost of platform, FPSO, TLP, living quarters, auxiliary equipment, power equipment)
- Subsea system costs (template, flowline, pipeline, risers, umbilicals, control system, metering, boosting)
- export system

DRILLEX
- drilling rate of vessel
- drilling materials (tubulars, cement, mud, completion, wellhead)
- test during drilling (DST, logging, pressure test, sampling)
- X-mas tree
- drilling tools

OPEX
- Important to estimate abandonment rate.
- workers' salaries
- insurance
- maintenance
- equipment
- well intervention
- power consumption
- production chemicals (MEG, wax inhibitor, corrosion inhibitor, etc.)
- pigging
- transportation and export
- troubleshooting

ABEX
- well plugging
- removal of flowlines, pipelines, offshore structure
- cleaning
- monitoring

NPV calculations

$$NPV = \sum_{i=1}^{N} \frac{CF_i}{(1+d)^i}$$

N ← abandonment

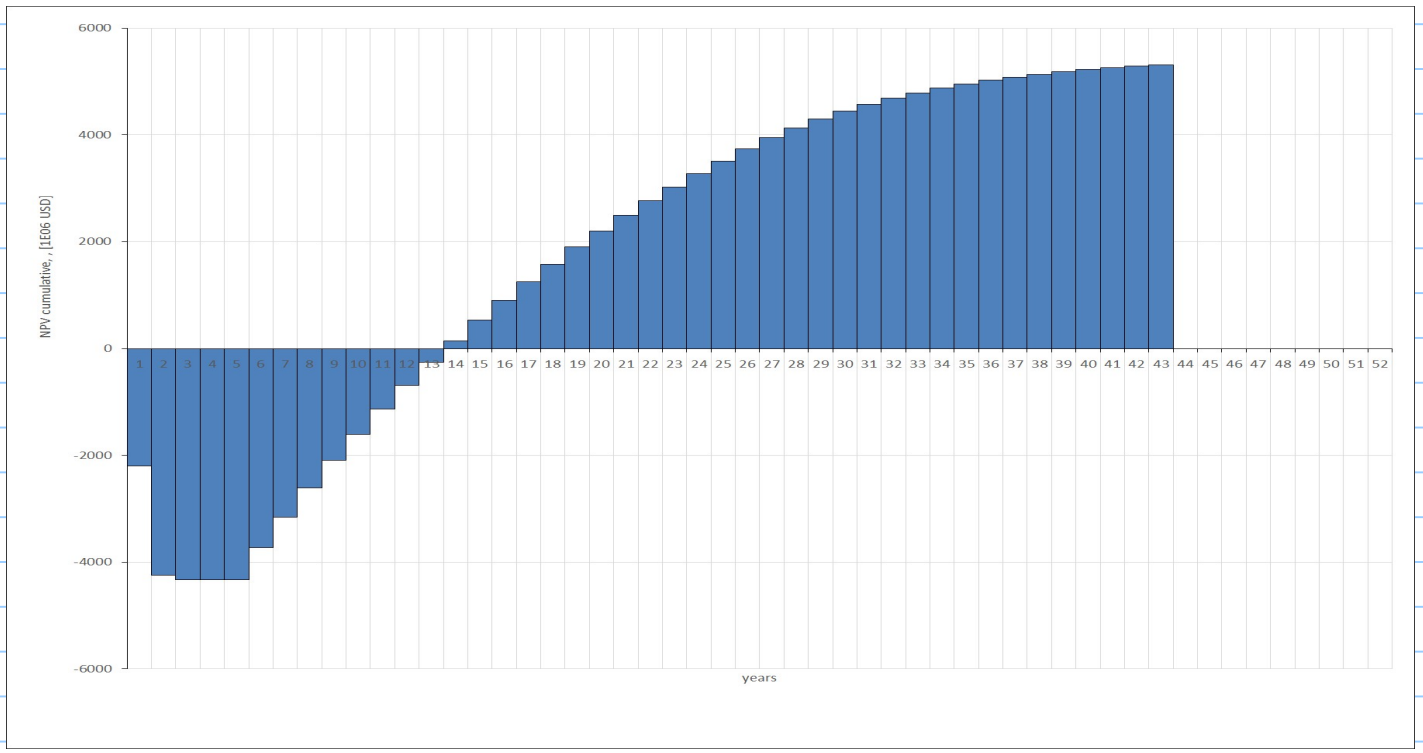
CF_i = revenue − expenditure of year "i"

↳ discount factor 5% → 12%

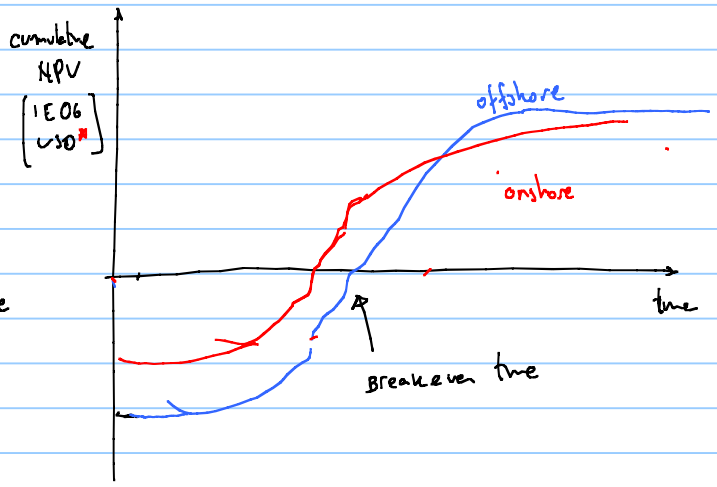
expenses are executed during early years so

$\frac{1}{(1+d)^i}$ is close to "1"

discount factor	0.07
year	1/(1+d)^i
1	0.934579
2	0.873439
3	0.816298
4	0.762895
5	0.712986
6	0.666342
7	0.62275
8	0.582009
9	0.543934
10	0.508349
11	0.475093
12	0.444012



Output to present NPV calculations



*USD of each year

USD of time "0"

the effect of uncertainty on the project is typically studied using "Ceteris Paribus" "one at a time"

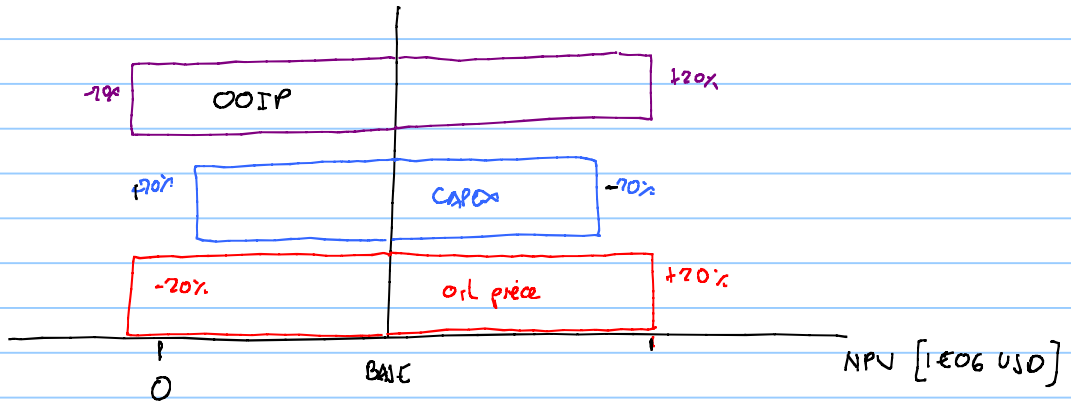
also called sensitivity analysis

- oil price uncertainty
- cost uncertainty (±40% → ±20%)
- N

BASE CASE NPV =

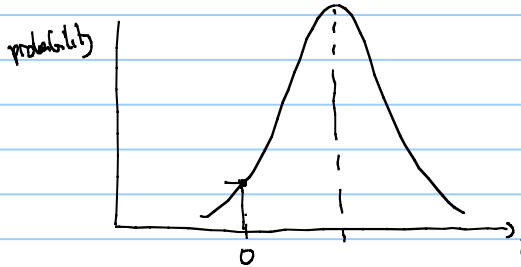
	min	max
Oil price	NPV	NPV
OOIP	NPV	NPV
CAPEX	NPV	NPV

Tornado chart

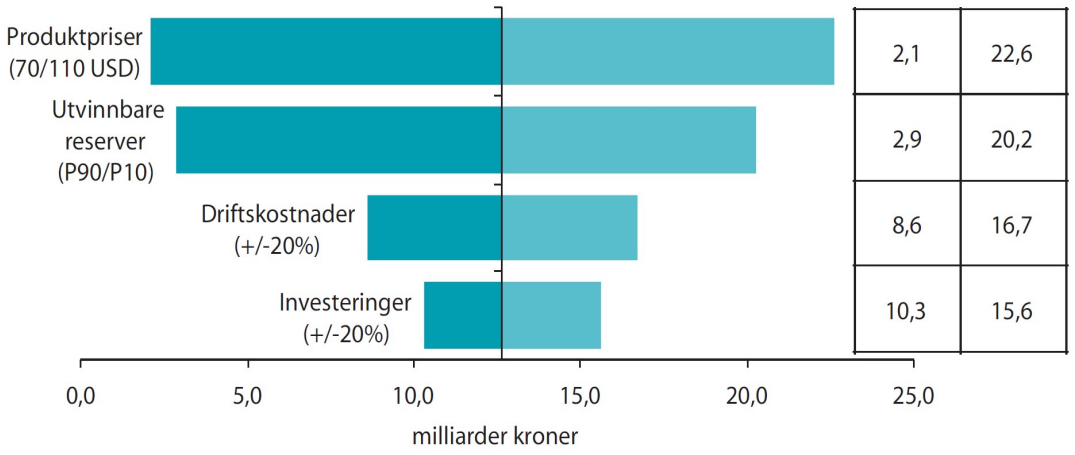


this is NOT a good way to evaluate/quantify uncertainty { we are neglecting other combinations }

a probabilistic evaluation is better!



this requires multiple { 100, 500, 1010, 10000 } evaluations



2,1	22,6
2,9	20,2
8,6	16,7
10,3	15,6