

M&A STRATEGY:
POST-ACQUISITION STRATEGY AS A
COMBINATION OF REAL OPTIONS

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This presentation

- Introduction to Post-acquisition Strategy
- Defining the Building Blocks of Strategy
- The Pay-off Method
- Analysis, Results & Decision-making
- Discussion & References

Introduction to Post-acquisition Strategy

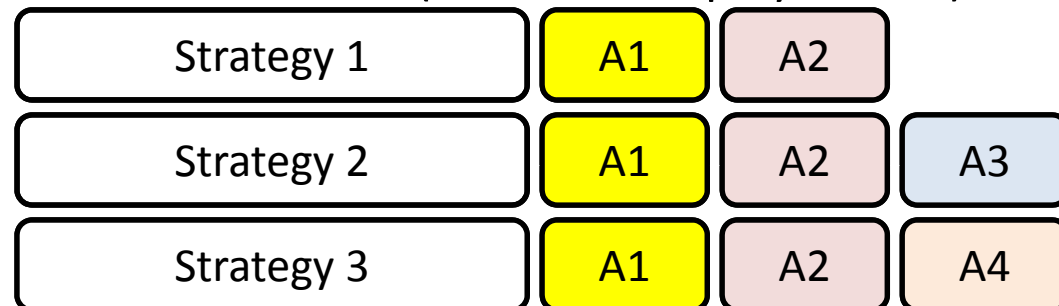
- Post-acquisition actions often make or break corporate acquisition performance
- Planning the post-acquisition strategy before the acquisition is very likely to enhance the chances to reach good acquisition performance
- Often "good enough" information on potential target companies is available already ex-ante / in the screening phase for post-acquisition strategy analysis (expert knowledge)
- The selection of the right actions is difficult as often it is not supported by structured analysis

The Building Blocks of Post-acquisition Strategy

- Post-acquisition actions are discretionary to the acquirer: they are taken if the outcome seems positive at the moment of decision-making – but the outcome is uncertain (option analogy)
- The actions are performed to enhance the value generation from the target company by the acquirer = the actions are investments designed to create synergies
- **The post-acquisition actions aimed at creating synergies are real options**
- It is not uncommon that *many* actions are possible - there is a pool of post-acquisition actions
- Not using any post-acquisition real options means running the target company in its former "stand-alone" configuration and in essence no synergies are created

The Building Blocks of Post-acquisition Strategy

- Many types of synergies are evident in the literature; main grouping is usually: cost synergies, revenue synergies, divestment (of assets / target company parts)
- There are often also timing and "staging" possibilities available
- The possibilities to invest in creating synergies are the building blocks of post-acquisition strategy
- By combining feasible combinations of these building blocks we can construct different post acquisition strategies (obviously we discard "clearly inferior" alternatives)
- The selection of the best strategy is straightforward; the strategy that creates most wealth is the best (but risk also plays a role)



Problems

- There is significant inaccuracy in our ability to estimate future cash-flows that our post-acquisition actions will generate
 - Knowing the timing of the actions and timing of cash-flows is not easy
 - Knowing the size of the cash-flows is difficult
 - Estimating possible non-cash value is difficult
 - We should value the building block combinations as real options (and compound real options)
 - We need methods that can "live with" these problems
- => Answer: Analysis of the post-acquisition strategies with pay-off method

Pay-off Method for Real Option Valuation

- The pay-off method is a new, easy to use and to understand method for real option valuation that is designed for practitioners
- The method is based on the established option valuation logic and on the use of possibility theory
- The method takes cash-flow scenarios as input and uses them for the creation of a pay-off distribution for the real option / asset being analysed – in this case the post-acquisition actions
- Single number real option value (ROV) and an expected net present value (NPV) can be calculated directly from the pay-off distribution
- The presentation of the results is usually in the form of distributions, together descriptives (ROV & NPV).
- Application areas so far include: M&A, R&D, IPR, Large industrial investments, Area development...
- The method can **easily** accommodate also compound real options

Pay-off Method: Cash-flow Scenarios

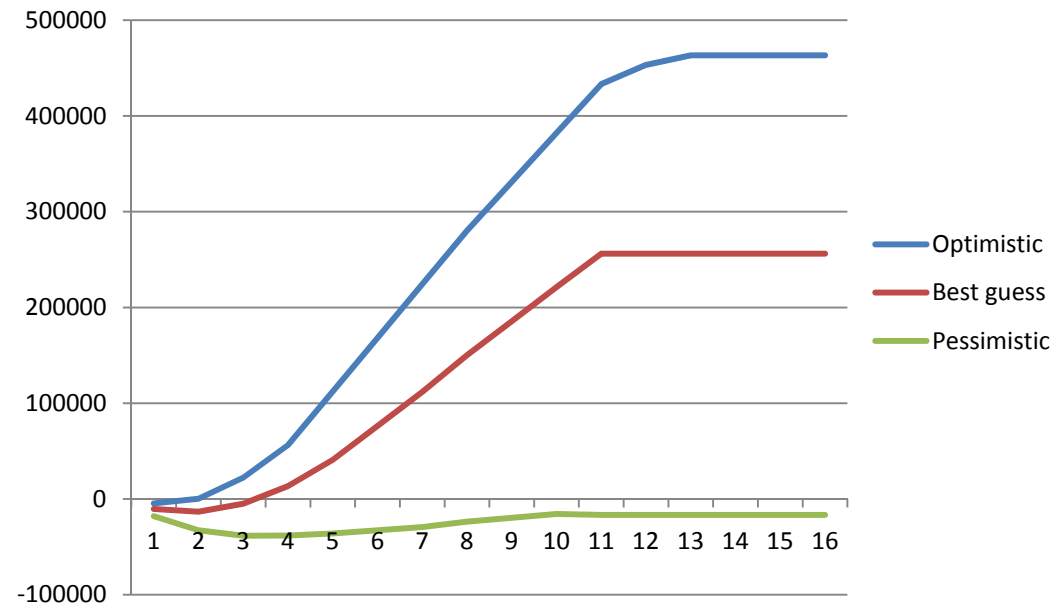
- Because we don't know for sure, but we still know a lot we can use cash-flow scenarios for the estimation of added value & costs from our post acquisition actions (strategy alternatives)
- We can estimate min & max values for added value and give a most likely estimate. This we can do for given number of future years; our estimates are the best one's we have = best knowledge available (no time series or process information usually available)
- We can construct the values from sub-parts, e.g., volume & added margin or similar

M & A STRATEGY

Strategy 1: Action 1 + Action 2																
Time (t)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cost Cashflows (implementing action 1)																
optimistic	4400	4000	2500	2000	0	0	0	0	0	0	0	0	0	0	0	0
best guess	6000	5500	5000	5000	4000	3500	1550	0	0	0	0	0	0	0	0	0
pessimistic	11000	8500	7000	6000	5500	4500	4000	3000	3000	3000	3000	0	0	0	0	0
Cost Cashflows (implementing action 2)																
optimistic	6000	5500	4500	0	0	0	0	0	0	0	0	0	0	0	0	0
best guess	6700	6000	5000	1550	1550	1550	1550	0	0	0	0	0	0	0	0	0
pessimistic	10000	10000	8000	7000	6000	5500	4800	4450	4400	4000	4000	2500	0	0	0	0
PV of the total cost from strategy 1 rd= 5,00 %																
optimistic	10400	9500	7000	2000	0	0	0	0	0	0	0	0	0	0	0	0
best guess	12700	11500	10000	6550	5550	5050	3100	0	0	0	0	0	0	0	0	0
pessimistic	21000	18500	15000	13000	11500	10000	8800	7450	7400	7000	7000	2500	0	0	0	0
Revenue source 1 (action 1, synergy source 1)																
optimistic	3000	5000	20000	30000	50000	50000	50000	50000	50000	50000	50000	20000	10000	0	0	0
best guess	1000	2000	10000	18000	27000	35000	35000	35000	35000	35000	35000	0	0	0	0	0
pessimistic	0	0	0	3000	5000	5000	5000	7500	7500	7500	0	0	0	0	0	0
Revenue source 2 (action 1, synergy source 2)																
optimistic	300	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	0	0	0	0	0
best guess	100	200	500	500	500	500	500	500	500	500	0	0	0	0	0	0
pessimistic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Revenue source 3 (action 2, synergy source 1)																
optimistic	0	5000	5000	5000	5000	5000	5000	5000	0	0	0	0	0	0	0	0
best guess	0	3000	3000	3000	3000	3000	3000	3000	0	0	0	0	0	0	0	0
pessimistic	0	1800	1800	1800	1800	1800	1800	1800	0	0	0	0	0	0	0	0
PV of the total positive wealth resulting from strategy rd= 20,00 % (it is possible to use separate discount rates for each revenue source)																
optimistic	3300	11000	26000	36000	56000	56000	56000	56000	51000	51000	51000	20000	10000	0	0	0
best guess	1100	5200	13500	21500	30500	38500	38500	38500	35500	35500	35000	0	0	0	0	0
pessimistic	0	1800	1800	4800	6800	6800	6800	9300	7500	7500	0	0	0	0	0	0
Net present value of Strategy 1: Action 1 + Action 2																
optimistic	454400															
best guess	238850															
pessimistic	-76050															

Cash-flow scenarios for one possible post-acquisition strategy

Pay-off Method: Cash-flow Scenarios



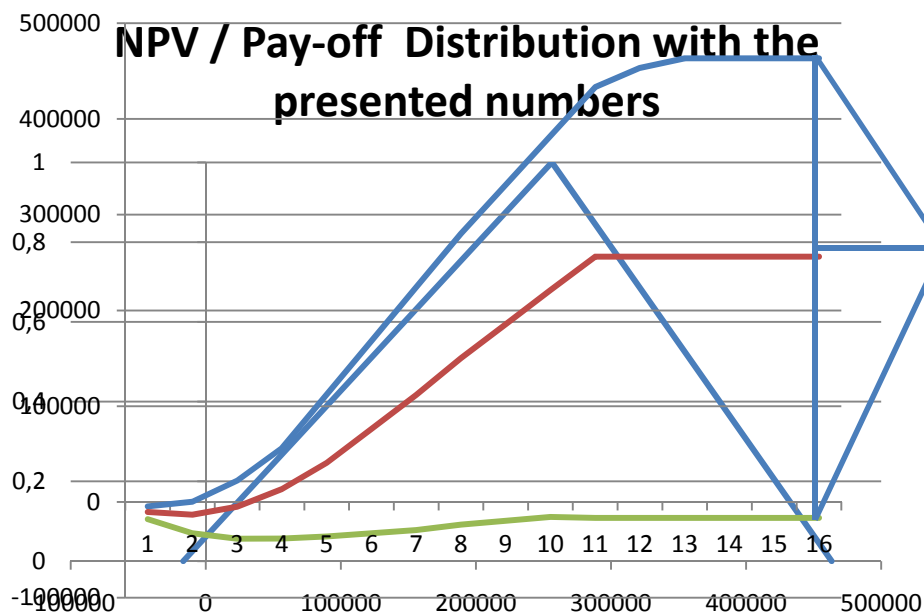
Cumulative NPV of the above scenarios shown graphically.
The scenarios show the uncertainty and the high / low thresholds.

Pay-off Method: Pay-off distribution

From the cumulative PV scenarios we can easily construct a (triangular) distribution:

- 1) we observe that the best guess scenario is the most likely one and assign it full membership in the set of possible outcomes.
- 2) we decide that the optimistic (max) and pessimistic (min) scenarios are the upper and lower bounds of the distribution - a simplifying assumption: we don't consider values higher than the optimistic scenario and lower than the pessimistic scenario
- 3) we assume that the shape of the pay-off distribution is triangular.

Pay-off Method: 2. Pay-off distribution



The distribution now shows us what our expectation for the post-acquisition strategy NPV looks like graphically.

Pay-off Method: Calculating the ROV & single number NPV

- From the pay-off distribution we can now calculate the ROV and a single number NPV with the pay-off method

$$ROV = \frac{\int_0^{\infty} A(x) dx}{\int_{-\infty}^{\infty} A(x) dx} \times E(A_+)$$

The trick is to know how to calculate the mean of the positive area, when we are not using a probability distribution. For a triangular distribution this is done as shown right.

If we want a single number NPV we use the formula:

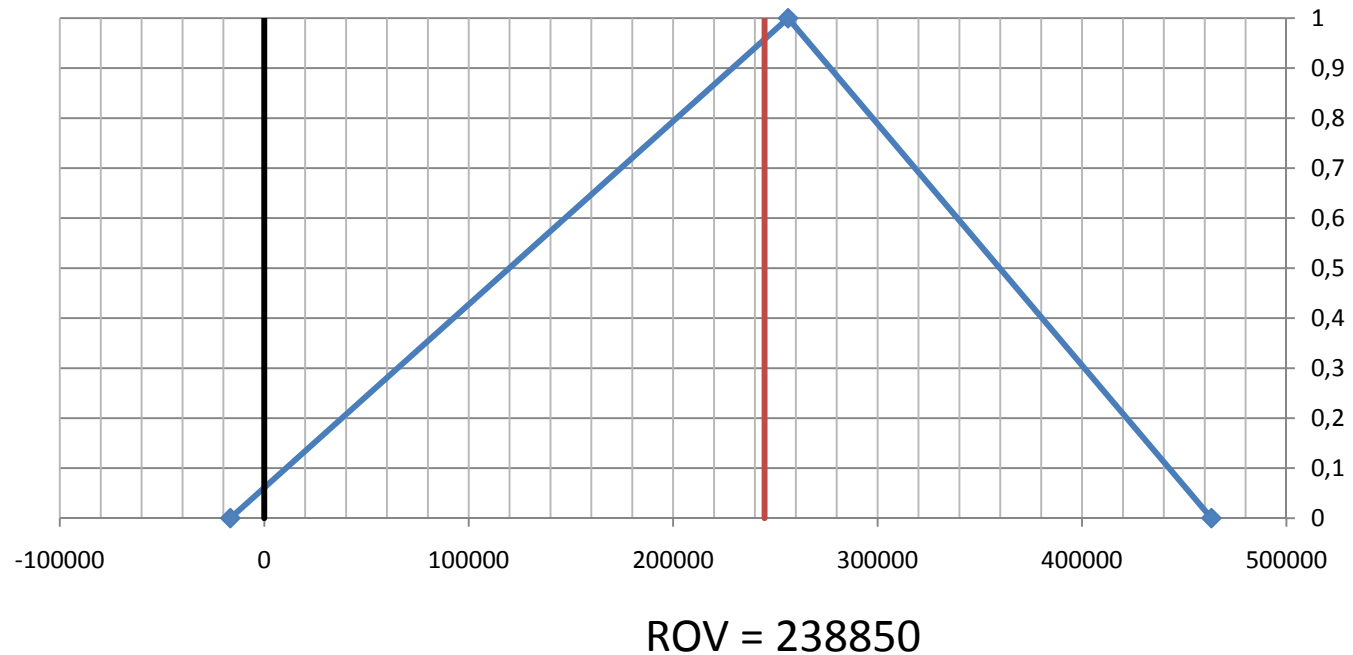
Real option value is the (possibilistic) mean of the positive side of the distribution multiplied with the positive area of the distribution over the whole area of the distribution.

$$E(A_+) = \begin{cases} \alpha - \alpha > 0 \text{ then } E(A_+) = \alpha + \frac{\beta - \alpha}{6} \\ \alpha > 0 > \alpha - \alpha \text{ then } E(A_+) = \frac{(\alpha - \alpha)^2}{6\alpha^2} + \alpha + \frac{\beta - \alpha}{6} \\ 0 > \alpha \text{ then } E(A_+) = \frac{(\alpha + \beta)^2}{6\beta^2} \\ \alpha + \beta < 0 \text{ then } E(A_+) = 0 \end{cases}$$

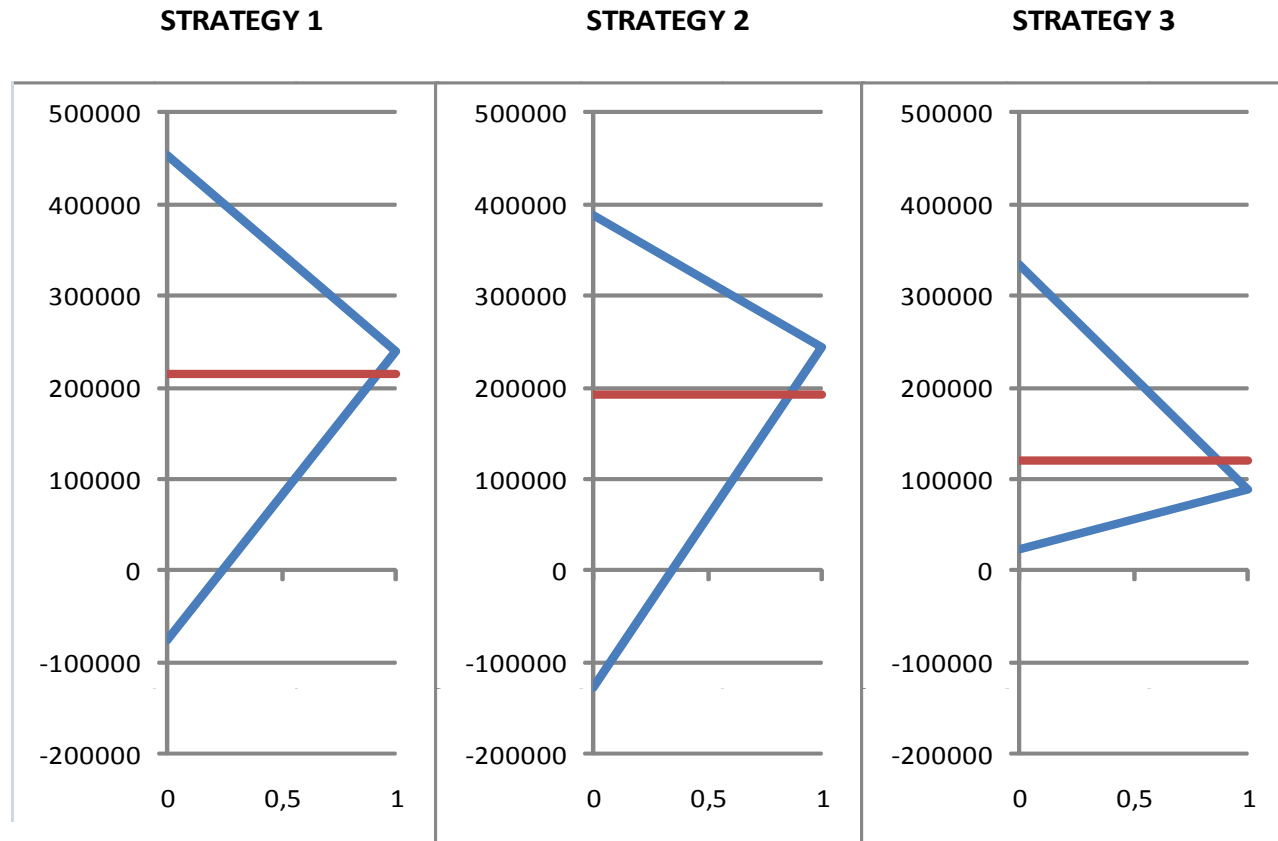
$$E(A) = \alpha + \frac{\beta - \alpha}{6}$$

Analysis, Results & Decision-making

We can see from the pay-off distribution how the NPV of the strategy is distributed (risk) and can compare it to the ROV value



Analysis, Results & Decision-making: increased comparability



Best guess	238850	Best guess	245000	Best guess	89650
Optimistic	454400	Optimistic	387400	Optimistic	333650
Pessimistic	-76050	Pessimistic	-127600	Pessimistic	23544
ROV	215309	ROV	191383	ROV	119299
Single # NPV	222292	Single # NPV	206633	Single # NPV	119299

Conclusions

- The pay-off method is a **simple and intuitive** tool for the the analysis of post-acquisition strategies that enables easy ROV calculation
- The method is **transparent** and allows very good **visual** presentation of the perceived risk
- The method shows well what the effect of changed information is in the risk and the profitability
- The method *allows compound option valuation*
- The pay-off method allows comparing different strategy alternatives and gives good support in selecting the most suitable post-acquisition strategy

Some references

Homepage of the pay-off method

<http://www.abo.fi/~mcollan/fuzzypayoff.html>

Collan, M., Mezei, J., and Fullér, R., 2009, A Fuzzy Pay-off Method for Real Option Valuation, Journal of Applied Mathematics and Decision Sciences

[Download the full paper](#)

Collan, M., Fullér, R., and Mezei, J., 2009, Compound Real Options with the Fuzzy Pay-off Method, 13th Annual International Conference on Real Options, June 17-20, 2009; Minho, Portugal & Santiago de Compostela, Spain

[Download full paper](#)