Valuing share options
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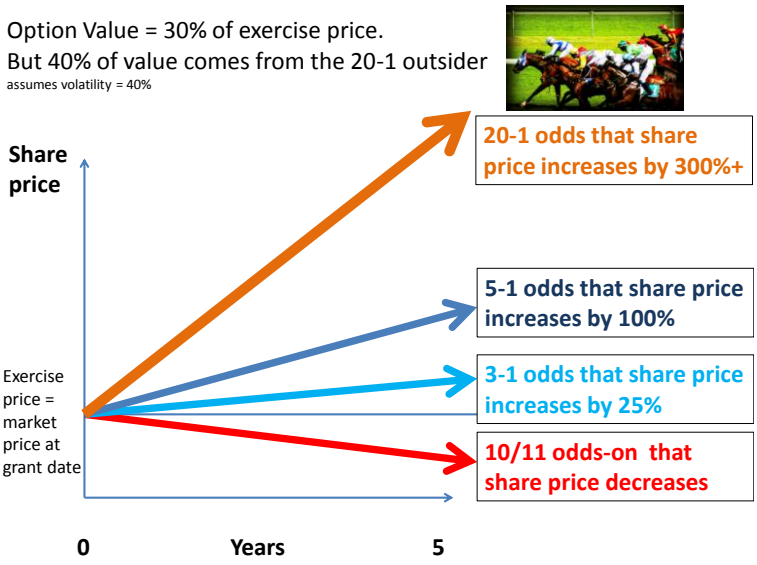
If I give you a share option, then it is odds on that it will not pay out[1], but it's a 20 to 1 outsider that it might pay out a lot, 5 to one that the share price will double and 3 to 1 that it will pay out 0.25 times the original exercise price.

The diagram says it all. It's easy to understand and it's roughly right!

In total, about 40% of the expected value comes from low probability high outcomes, or in our racing analogy the 20-1 outsider.

The median expected share price growth rate is about 5% p.a.[2] Less than 20% of the expected return from a share option comes from such outcomes. And this is why traditional analysis of outcomes using a single expected value fail miserably to model what is important to shareholders and executives.



Of particular importance, is the fact that much of the value in options comes from the unlikely (low probability) high price gains. To gain the full motivational benefit from incentive pay, the Board needs to understand the strategies that might lead to these gains and the risks attached to them. Such strategies might be:

- New product developments and launches
- Expansion into new geographies
- Financial strategies such as increased leverage
- Acquisitions and/or mergers.

So, I strongly urge Boards and Remuneration Committees to undertake scenario analyses which can reflect the share price outcomes shown in the diagram. Modelling just 4 outcomes usually provides much better insight than single price estimates favoured by accountants and does so without the infinite complexity of Monte Carlo simulations.

I have been worrying about how to value share options for many years, from way back before IFRS2 forced others to learn about the Black-Scholes theorem, Monte Carlo simulations and Binomial Models.

The problem with the Black-Scholes valuation of options is that it is wrong. It gives a single figure estimate. Its inbuilt assumptions do not reflect reality. It assumes volatility and dividends are constant over time. Executives do not discount future (risky) rewards at the risk free rate; they cannot diversify their risk so as to create a market neutral portfolio; they tend to exercise sub-optimally before the theoretically best time to do so; and most do not understand the maths behind the capital asset pricing model, random walk of share prices and lognormal share price distributions. Concepts such as share price volatility and beta are not part of the accountants' lingua franca. Black-Scholes theory cannot take account of performance conditions. The correlation (or lack of it) between performance measures and share price movements can significantly impact on share option values.

Monte Carlo is a lovely place and has a great casino and has given its name to simulations that can value options. Whilst theoretically more correct than Black-Scholes for this purpose, the complexity of a Monte Carlo model (often involving millions of simulations) creates a distraction. Similar problems exist with Binomial and Lattice models. They can however allow performance measures to be input into the models and can also cater for early option exercise behaviourial traits of executives. But their power is also their flaw and all too often just like the other models they too become either a black box or divert attention into the underpinning methodologies and assumptions.

Cliff has an MA in Maths and Statistics from Cambridge University and understands the maths behind option valuation models. However explaining options to executives, so as to get the maximum motivational impact, is an art not a science. Try this simple model and it's odds-on you will do better. He can be contacted at MM&K on 020 7283 7200.

[1] The reason it's odds on rather than evens is because it is a lognormal distribution.
[2] Assuming dividends of 3%, this gives an expected total shareholder return of 8% p.a.