Practical Application of Financial Modelling:
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Investors are increasingly reliant on financial models to evaluate opportunities and capitalise on them. Having access to an advanced financial modelling (FM) capability will be a competitive advantage in future as competition for investment opportunities is higher than ever before.

Quoting a recent Evening Standard article by Anthony Hilton: 'According to a Bain Capital report cited recently by John Gapper of the FT, by 2020 the world's financial assets will outbalance its GDP by ten to one. There will be $900tn of assets vs $90tn of GDP. The result will be a world 'structurally awash with capital' and with a corresponding shortage of places in which it can be invested.'

In this blog article I have drawn up a couple of examples of how investment decisions rely on FM.

Types of Financial Modelling:

The examples refer to different investor sectors which use fairly different types of FM. I have split the financial modelling into two categories – discrete and continuous. The distinction is fairly artificial, and is one of scale. Continuous FM applies much more theory, advanced mathematics and computing power.

Continuous FM is what I have called the sort of modelling done by quants in investment banks or hedge funds. Groups of skilled mathematicians develop algorithms to price financial instruments traded on the markets. Data feeds into the models may be continuous, allowing near instantaneous response times and automated trading.

Discrete financial modelling is often done on Excel spreadsheets by people with some level of accounting knowledge (as financial statements are often a key output). Models may incorporate quite involved logic, although this is likely to be mathematically much simpler and may depend on operational metrics like sales volumes and prices, or headcount and salaries. In certain instances knowledge of Visual Basic is an advantage in building a degree of automation into these models, and some knowledge of more advanced maths can be helpful too.

Examples:

Continuous FM:

If a speculative investor thinks that a tech company's shares may rise by a particular amount, he might investigate what the market is offering for call options on those shares in future. The trader of the option may calculate the option price using the Black-Scholes-Merton (BSM) formula and a particular volatility estimate to derive a price of £1.50 per option for a strike price of the shares at £4 higher than the current price.

If the investor thinks the shares will rise to value comfortably higher than that amount in future, then the option price would be within his investor's acceptable price range. (If he expects the shares to rise by £6, he can take up his option and buy the shares, selling them again immediately for (£6-{£4+£1.50)=} £0.50 per share. The trader of the option, on the other hand, makes a loss of {(£4+£1.50)-£6 =} (£0.50)).

However, if the volatility of the exchange on which the shares are traded is expected to be far greater, then the option price may be, say, £3, and the investor will choose not to speculate. So, traders of the instrument will watch the variables that they use to determine its price very closely.

The BSM model relies on both on some understanding of statistics and of differential equations. In its simplest form, it relies also on assumptions such as no dividend payments, amongst others. As can be seen, this level of knowledge is not within the reach of the layman.

(As a practical example of how a mathematical technique can be applied to a set of historic data to estimate the value of a function for a future data point, please see the regression / linear interpolation app I have designed. The app is not intended as an aide to any real financial analysis, just a mathematical illustration.)

Discrete FM:

Government policy subsidises wind farm development by means of the renewable obligations certificates that essentially provide a premium to the market price per megawatt of so-called 'brown energy' (coal power). A private equity (PE) investor specialises in onshore wind farm investments, and this level of government subsidy is sufficient for him to initiate a fundraising of £500m for this sort of project.

The PE investor is prepared to invest in building the wind farm for an IRR of 10%, which a financial model of the expected required investment cost and future power generation revenue cash flows shows to be quite feasible. The investor expects to use 80% gearing, and his financial model can comfortably demonstrate compliance with bank covenants for a typical project.

The PE investor will be heavily dependent on the financial model for each particular investment in order to determine what level of debt the project can support. In order to raise the debt, the lender is likely to require an external audit of the financial model.

This is much more the type of financial model that most people are familiar with – a forecast of cash flows and margins of safety which delivers a fairly thorough analysis of the issues at stake and the chances of such an investment turning a profit.

(As an example of a cash flow analysis, please have a look at the financial app for a simple comparison of stocks and bonds. Again, this is a very simplified model for illustrative purposes only.)

Conclusion:

The above examples refer to potential investment opportunities. In either case, it is obvious that the models that are needed to enable the investor to determine the worth of the opportunity are likely to be complicated and to have required substantial time and effort by skilled resource.

The ability to marshall this resource as required will greatly facilitate the investment decision-making process.