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NEWS

Not so “rare”: the valuation method behind the Tethyan challenge

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Ronnie Barnes, an expert witness at Cornerstone Research in London, explains that a supposedly “rare” valuation method at issue in a recent challenge to an ICSID arbitrator is in fact a well-established methodology routinely used in business valuations for certain industries in certain circumstances.

As reported in *GAR*, Pakistan applied in July to disqualify Stanimir Alexandrov from the ICSID panel hearing its dispute with Tethyan Copper Company on the grounds that the claimant had submitted an expert report relying on a “rare valuation method” that is also at issue in another case where Alexandrov is appearing as counsel and has retained the same expert.

The challenge has brought to the attention of the international arbitration community - or at least those interested in quantum issues - a valuation method known as “modern” discounted cash flow, or DCF. While the expert report that has given rise to the challenge is not yet publicly available, two previous reports by the same expert are. A review of these reports shows that, rather than being “rare,” the valuation method at issue is in fact an amalgamation of a number of standard and well-established techniques. In this article, I provide a non-technical description of these techniques, and explain the circumstances under which they are or are not more appropriate than what Tethyan’s expert refers to as the “simple” DCF method. An important caveat is that I express no opinion as to whether the expert’s use or implementation of the method in either of the cases in question is appropriate. As background, it is worthwhile briefly recalling how “simple” DCF is used as a valuation methodology. The starting point for the methodology is that, at any point in time, the value of an asset (be it an industrial plant, mine, or block of shares in a company) is determined by the future cash flows that the asset is expected to generate. Having estimated these expected future cash flows, the next step is to determine a discount rate that can be used to compute their net present value (NPV). The purpose of discounting is to account for both the time value of money and the level of risk or uncertainty inherent in the cash flows. Generally speaking, the higher the risk, the higher the discount rate.

The first element of the “modern” DCF methodology is an observation - long known to valuation practitioners - that there is an alternative approach that yields exactly the same NPV as the “simple” DCF approach. In this approach - typically referred to as certainty equivalent valuation, or CEV - the expected cash flows are reduced by a risk adjustment and the risk-adjusted cash flows are then discounted at the risk-free rate. In other words, rather than capturing both the time value of money and risk in the discount rate, risk is accounted for in the cash flows being discounted, and only the time value of money is captured by the discount rate.

As a simple numerical example, suppose that the expected one-year-ahead cash flow is $110, the risk-free rate is 4%, and the risk premium appropriate to the cash flow is 6%. In this case, the discount rate is 10% and the NPV of the cash flow is $100. Under the CEV method, it can be shown that the appropriate risk adjustment is $6. Applying this risk adjustment to the expected cash flow of $110 yields a risk-adjusted cash flow of $104 (ie, $110 less $6), which, when discounted at the risk-free rate of 4%, also yields an NPV of $100.

It is important to note that this alternative approach is not a panacea. All of the challenges that a quantum expert faces in determining the risk premium appropriate to a given future cash-flow stream are simply transferred to the problem of determining the appropriate risk adjustments. For example, in the paragraph above, the question of how the $6 risk adjustment was reached was conveniently skirted over. However, it does seek to illustrate that discounting at the risk-free rate does not automatically mean that the resulting value (and related damages claim) is inflated, provided that the expected future cash flows have been properly risk-adjusted.

Given this, it seems reasonable to ask what the point of the CEV method is. The answer - and this is essentially the second strand of the modern DCF approach - is that in certain cases, the CEV method is definitively easier to implement. These cases are characterised by the fact that there is no need to separately estimate expected cash flows and then determine the appropriate risk adjustment. Rather, it is possible to accurately estimate the risk-adjusted expected cash flows directly. This clearly makes undertaking a valuation easier, and so begs the obvious question of when this convenient situation is likely to arise.

Unfortunately, this approach of directly estimating risk-adjusted expected cash flows, and discounting at the risk-free rate, is really only feasible in a limited number of settings. One specific such setting is where the risk or uncertainty in the cash-flow stream that is being valued arises from an exposure to the price of a traded commodity. For such commodities, a key feature of the trading activity is the existence of futures or forward markets that allow market participants to agree today to lock in a (forward) price at which they will transact at some point in the future. For example, if the current one-year-ahead forward price of copper is $6,500 per metric ton, this means that two market participants can agree today to buy and sell a specified number of metric tons of copper at this price one year from today.

It is this fact that makes the implementation of the CEV method a realistic possibility, since it can be shown that these forward prices are actually the same as the risk-adjusted future prices. Consequently, to value a stream of cash flows for which the only source of uncertainty is the price of copper (eg, the revenues from a copper mine where there is no uncertainty regarding output levels), there is no need to either forecast what the price of copper will be in the future, or to estimate a discount rate that adequately captures the risk in this cash-flow stream. Rather, the valuation practitioner would simply observe the relevant copper forward prices (one year ahead, two years ahead, etc), multiply these by the output levels in the relevant years, and then discount the resulting cash flows at the risk-free rate. The resulting NPV is the value of the mine's future revenue stream, and it is important to note that this result is valid whether management actually chooses to sell forward the mine's output or to take its chances and sell this output at whatever prices happen to prevail in the future.

None of this should be controversial and, indeed, the CEV method is covered in most corporate finance and valuation textbooks. Admittedly, it receives less attention than the "simple" DCF method, in large part because in many cases the two methods are essentially identical, but this does not alter the fact that there are situations where CEV may be a superior and easier to implement valuation methodology. Similarly, the use of forward contracts to strip out the risk from cash flows tied to commodity prices is typically discussed at length in such textbooks, and is one of the driving forces behind the multitrillion-dollar financial derivatives markets.

So why then the controversy? It is plausible that the issue stems, at least in part, from the terminology used. The use of the word "modern" in "modern DCF" could be interpreted as suggesting a speculative and untested methodology, whereas the reality is that in effect, the methodology is essentially a repackaging of acknowledged and accepted valuation techniques. The same is true for the third strand of the methodology, namely the use of the concept of "real options". Both simple DCF and the CEV method (as described above) suffer from the potential flaw that they are static in nature and fail to reflect managerial flexibility. Returning to the example of the copper mine, an implicit assumption in the use of either of these approaches to value the mine would be that the mine's management acts passively. In other words, production would simply continue year after year, and the output sold, until the mine's reserves are exhausted. In practice, management has available to it a number of operating and strategic options that it will seek to exploit to their full potential - and doing so could increase the value of the mine well above that generated by the DCF or the CEV analysis.

For example, management would presumably like to expand production when the price of copper is high, but to curtail production (or even temporarily close the mine) when the price is low. It may even want to abandon the mine entirely if the price of copper falls to a very low level and there is no realistic prospect of it rebounding, while on the cost side, management may value the opportunity to invest in an alternative technology which reduces the cost of production.

It is almost a truism that flexibility - in all walks of life - has value, and the same is no less true in a valuation setting. These "real options" (the word "real" being used to distinguish them from the "financial" options that are traded in the world's derivatives markets) have genuine, and potentially considerable, value and a failure to recognise this could result in a valuation that is significantly understated. To address this potential failing, over the last 40 years or so, a valuation methodology known as real options analysis has been developed that, broadly speaking, uses techniques that were originally developed to assess and value financial options to assess the value of managerial flexibility

Again, a word of caution is in order. The extent to which real options are relevant to a particular valuation exercise will vary enormously. For certain industries - in particular, natural resources and commodity markets - real options can often account for a sizeable fraction of the value of an asset or investment, whereas in other cases, they are of only negligible importance. As a result, the decision to incorporate real options into a valuation should follow only after a careful qualitative analysis of what options are in fact available to management and how important these are to the strategic and operating decision-making process.

Further, even when real options *are* considered to be important, quantifying their value can often be far from straightforward. As noted, the techniques that comprise real options analysis were originally developed for the purpose of valuing financial options, and in this setting, the necessary inputs to the various valuation models are typically relatively easy to observe. In a real options setting, this is not necessarily the case. For example, if attempting to quantify the value of the option to develop a plot of land, a key input is a measure of the potential variability in the value of the land itself, and it is not immediately obvious how this should be determined.

All of which is not to say that real options analysis cannot form a robust element of a valuation exercise performed with care. With attention to the realities of the situation being assessed, such an analysis can be indispensable in certain cases to generating a valuation that properly captures the underlying economics of the asset being valued. But the same is true of any valuation methodology. It is often said that valuation is as much of an art as it is a science, and if this means that the choice and implementation of the methodologies appropriate to a given situation require judgement and thoughtful assessment, this is undoubtedly true. The fact that a particular methodology - be it real options analysis or "modern" DCF - is unfamiliar does not, in and of itself, render the methodology unsuitable. It is only when a methodology is applied in inappropriate settings, or its implementation is flawed, do problems start to arise.

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