

In defence of exotics

While much was done to quell the panic ignited by the high-profile “derivatives-related” losses of the 1990s, exotics remain a mistrusted and misunderstood entity. But a sensible approach to exotics can provide unique protection benefits, argues David Rowe

Most of us can vividly remember the “great derivative scare” of 1994. After a series of well-publicised mega-losses at Procter & Gamble, Gibson Greeting Cards and Orange County, among other institutions, a near panic gripped the public mind. Derivatives (or “the D-word”) were suddenly front-page news, not just in the business press but in the general news media as well. Interest ran so high that derivatives were even the subject of an embarrassingly misleading and ill-informed segment on the CBS news programme *60 Minutes*. The negative publicity became so severe that many worried it would do lasting damage to the industry.

However, the world reverted to business as usual remarkably quickly. As in the case of the introduction of internal value-at-risk models for risk-based capital, I believe market participants owe a little-acknowledged debt to regulators and other selected public officials for this outcome. It would have been easy to lie low and say nothing in the face of the groundswell of negative sentiment. Nevertheless, many undertook the painstaking task of patiently and repeatedly explaining how these instruments actually mitigate risk in the vast majority of cases. The generally accepted wisdom settled into a view that simple plain vanilla derivatives were useful and socially beneficial. Continued opprobrium was reserved for “highly complex exotic transactions”. This fed a popular perception that the only basis for such complex trades was a desire on the part of market professionals to confuse clients and obscure fair valuation. To some degree, I find this view survives even today.

Complexity

I am a strong advocate of “keeping it simple”. Technicians with strong quantitative skills are often tempted to deploy those skills in search of the perfect solution while ignoring much cheaper and quite effective simple alternatives. I refer to this as letting the perfect be the enemy of the good. Nevertheless, the world is a complicated place, and simple solutions will not meet the need in every situation. While some conscious obfuscation was at work among market-makers in 1994, this is certainly not the primary reason for the existence of complex exotic derivatives. Rather, the customised needs of end-users are the primary motivation for creation of such transactions.

One of the most common variations on a simple option is a knock-out structure. If this type of trade moves sufficiently far out-of-the-money, it “knocks out” and the transaction is formally cancelled. An example of where this can be especially useful is for certain commodity producers. Such firms can augment their income by writing calls on the commodity they produce. In



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some cases, however, the notional volume of such options they can have outstanding is legally restricted to be no more than their estimated production over a corresponding period.

Assume a producer has written the maximum amount of call options and then there is a significant drop in the price of its product, making the written options effectively worthless to their holders. The producer would like to write more call options struck close to the new lower price. It is restricted from doing so, however, until the existing far out-of-the-money options expire, thereby missing a potential additional revenue opportunity. Here a knock-out feature is especially attractive to the option writer. With such a provision in place, a significant drop in the price will cause the options to be cancelled, removing the constraint on writing more options at the new lower level.

Another example is a forex Asian basket option whose value is determined by the average over time of multiple underlying exchange rates at each point. Such options provide much more efficient hedging for a company with multiple currency exposures than would a set of simple options on each currency. This is because a portfolio of simple options contains the possibility of windfall gains. Even where weighted-average exchange rate movements benefit the company's base-currency profit and loss, some of the individual forex options may finish in-the-money, resulting in a further gain on the hedge position. On the surface this may seem attractive, but such potential windfalls are not free. The price of the set of simple options needed to give full down-side protection will be higher, potentially much higher, than a corresponding basket option on the same currencies.

For example, assume a US company expects earnings denominated in Australian dollars, Canadian dollars, Swiss francs, euro and sterling over the next six months. For simplicity, assume

the expected value of these earnings at current spot rates is \$1 million for each of the five currencies, and that the conversions will occur in equal weekly instalments. Further, assume the company wants to protect the US dollar value of these earnings against a depreciation in the average value of the five currencies against the dollar over that period. Specifically, the company wishes to ensure that it will realise no less than 97% of the US dollar amount implied by the current forward forex rates.

The ideal transaction to achieve this desired protection is a six-month Asian put, with weekly sampling, for an equally weighted basket (in US dollar equivalent terms) of the five currencies. I used an advanced Monte Carlo technique to price this option based on recent market conditions (see www.otci.net). This indicates a cost of \$5.94 per \$1,000 hedged, or just under \$30,000 to hedge the entire \$5 million equivalent amount for the six-month period. To achieve the same assured protection using five single Asian options would have cost \$8.133 per thousand for a total premium in excess of \$40,000. This costs over one-third more than using an efficient Asian basket option.

Certainly, market-makers will charge higher spreads for complex transactions that are difficult to hedge. As a result, the price advantage of a complex basket option over a series of singles may not be as great as indicated here. Nevertheless, considerable savings are available to end-users who forgo possible windfall gains and hedge with complex options tailored to match their specific risk profiles. In essence, this is simply focusing the premiums paid on pure insurance against a firm's actual risks. While it means forgoing potential windfall gains, these should not be part of a properly structured hedging programme in the first place, especially since the cost inevitably is higher than the expected gain.

Independent valuation

Derivatives contracts between corporations and professional dealers are generally viewed in the courts as agreements between two sophisticated entities. End-users should therefore have an independent means of establishing the fair value of such contracts. But the cost of the analysis makes it virtually impossible to obtain meaningful third-party quotes on a recurring basis for highly tailored complex transactions. However, the internet and ASP-style provision of data and software could offer a solution. A service that allows end-users to price such highly customised transactions efficiently would facilitate their use on a wider scale. In addition to allowing end-users to assess the fair market value of their existing trades, it would permit them to analyse alternative strategies for hedging those contingencies not yet covered. If experience is any guide, where there is a need, markets will eventually provide a solution. ■