It is the nature of world markets that any kind of uncertainty can cause major movements in asset prices, from fixed income to currencies, equities to commodities. The recent slump in equity markets triggered by uncertainty in China is a prominent example, and the fluctuations in oil prices seen in recent years is just another reminder of the difficulty in predicting future trends. This is where hedging strategies come into their own.

Despite the shift towards renewables and alternative energies, our dependence on oil as a raw material remains a constant. Recent volatility in oil prices at approximately 2% per day has led to uncertainty on prices going forward, and most of this volatility has been on the upside, with prices increasing dramatically over a short space of time. Spot market oil prices (for immediate delivery) had approximately doubled in just two years before falling back from their peak in mid-2006. Traders in futures contracts on Nymex are currently forecasting that oil prices will fluctuate heavily and trend upwards in the future, and turbulence in the Middle East would seem to support such predictions, but the fact remains that spot prices are virtually impossible to predict.

This is likely to be remembered as the year when environmental concerns went mass market and when the politicians rushed to jump on the bandwagon. Suddenly every political party has its own detailed proposals to increase alternative energy production and usage. However, history suggests that it could take some time to remove our dependence. Indeed, Goldman Sachs recently forecasted that we have not yet reached peak production for oil and associated consumption of oil.

Dealing with uncertainty

The result, of course, is that businesses and investors need to look at strategies in dealing with such uncertainty in both oil and equities. Research being undertaken here at the Centre for Financial Markets, UCD School of Business may offer some help. We are examining the role of futures contracts — where deals are done today but delivery takes place at a predefined future date. In particular, we are looking at their potential for offsetting price risk, especially oil and equity risk, while still keeping the research relevant to other market risks such as currencies.

As a practical example, take a typical airline. Its future fuel needs are fairly clear, but it is faced with the problem of not knowing how much that oil will cost six months down the line. The volume it requires might be costed at €10 million, but this could have risen to €11 million or €12 million in six months. On the other hand, while less likely, it might cost just €9 million. The airline has to look at a variety of strategies to combat this uncertainty.

The business might follow a no-hedge strategy, whereby it takes no action and hopes that oil prices fall or remain constant. It might buy the oil today and take on the uncertainty times mean significant movements in asset prices from oil to equities. Current research by the Centre for Financial Markets, UCD School of Business may offer help to businesses in formulating more effective hedging strategies, says the Centre’s Director, Professor John Cotter.

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implied costs of storage and, of course, financing the purchase. Or it might opt to follow a hedging strategy using futures or forward contracts to agree to buy the volume of oil in six months’ time at a set price that essentially would hedge against any price movements in oil over that period. This represents a long position in the contract. The price in the contract would be fixed today so the business would know what it has to pay when completing the transaction. This offers cost certainty regardless of what happens to oil prices. Our research shows that this strategy is the most promising.

Calculations indicate that for the worst-case scenario, a substantial proportion (15%) of the price risk is removed, compared to a no-hedge strategy from an application to the world’s most commonly traded commodity, the Nymex West Texas Light Sweet Crude contract. Moreover, the risk-reduction gains are almost 60% for the best-case scenario.

There are trading costs of up to 5pc associated with employing such a forwards or futures strategy, but these are negligible compared to the potential savings. Such a hedging strategy offers far stronger risk management and pricing certainty and it precludes the costs involved in financing and storage with a buy-and-hold strategy.

Hedging effectiveness

However, it must be noted that the above are simple examples. There are many hedging tools and strategies that may be used to try to engineer an efficient hedging outcome. Investors need to use a benchmark to decide whether a hedging strategy works or not. For one benchmark, the hedging strategy might appear to do well, but if another benchmark is chosen the strategy might be poor. We have also done significant research into this area of hedging effectiveness.

We found that traditional measures based on standard deviation were not capable of measuring risk that most hedgers were interested in. A hedger is usually either interested in offsetting price increases or decreases but not both. A market risk measure that has grown in popularity is Value at Risk (VaR), which measures the loss for a certain probability. Unlike standard deviation it is estimated separately for upside and downside risk. However, we found that it, too, had its shortcomings, and we have proposed the use of an alternative measure — Conditional Value at Risk (CVaR), which addresses some of these shortcomings. CVaR is preferable as it estimates not only the probability of a loss (either upside or downside), but also the magnitude of a possible loss.

Our research has demonstrated that investors need to use several risk measures as part of an overall risk management strategy, but more importantly, they need to decide which risk measure they are seeking to minimise, as hedging effectiveness may vary depending on the risk measure used. Also, hedges may not be as effective at reducing risk in volatile markets that are skewed with either more upside or downside risk. This means that investors may face the risk that their hedges will not fulfil their function of risk reduction during stressful market conditions when they are most needed.

Professor John Cotter is Director of the Centre for Financial Markets, UCD School of Business. He carried out the above research with PhD student Jim Hanly. They are currently examining the role of investor attitude to risk by estimating market risk aversion and its associated impact on hedging.