Hedging*

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You've probably heard of the expression 'hedge your bets'. The idea is to shore up an existing bet by placing money on a contrary position- such as backing both sides in a football match. The financial concept of hedging an asset has a more definite goal- the locking in of the price for that asset, either as seller or purchaser. Whilst (as shall be described) various factors may conspire to bring about a loss or gain, these will be due to factors outside the direct control of the hedge placer. In theory, a hedge can perfectly balance so that however the market moves, the money you receive or the price you pay stays the same.

But how exactly do you bet against yourself on the finance market? Hedging first emerged as a practice used by owners of commodities (initially agricultural ones such as livestock or grains) and was made possible by the development of trading in futures contracts. Thus to understand a hedge it is necessary to have a simple understanding of how futures work.

A futures contract is an agreement to supply or purchase a (fixed and precisely defined for easy exchange) quantity of a given commodity for a set price at a set time in the future. You are said to hold a long position if you are agreeing to buy; and a short position if you are agreeing to sell. However, the vast majority of such contracts are not fulfilled by actual exchange of the commodity for cash- for instance, the number of long futures positions in cocoa may exceed the amount of cocoa available in the world several times over. Instead, traders seek to make money from futures by taking a long position at one price and selling it for a higher one, or taking a short then later a long to close the position, hopefully at a profit (this is made possible through the exchange clearing house, which facilitates the cancellation of long and short positions held by the same person).

To see how you could actually make money on a future, assume you have started out with a short position in December 2004 Soybeans. This means that in theory you would have to supply 5,000 bushels of suitable soybeans on the set date. However, before December rolls around, suppose the price of a soybean future falls (meaning people won't tolerate as high prices for 5,000 bushels- e.g.

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because the cash value of those bushels has itself decreased). So now you take a long position at a price below what you paid for the short. Through the clearing house, these two transactions cancel, leaving you with a profit equal to the difference in the trading price. Had the price of futures gone up before December, eventually you'd have had to obtain a more expensive long future (incurring a loss) or actually purchase the requisite volume of soybeans (which also cost more than your future will give back, meaning a loss, and the effort required to obtain, store and transport the soybeans is likely to make things even worse). Had you initially taken a long position, then you'd want the value of soybeans to go up, as then you could purchase them below market price to make a profit, or more likely just sell the contract (through the exchange) to someone who actually has a use for the beans (or is forced to unfavourably close a short position they hold).

If you're in the business of buying or selling Soybeans, and are arranging such a transaction for December, then you'll be happy with the deal compared to paying today if prices fall or rise, respectively. Considering these roles, it should be possible to see how an offsetting position (the hedge) can be taken in the futures market to ensure neither profit nor loss, but the security of getting today's price at a later date:

- **To guard against price decline (as a producer, processor or distributor of a cash commodity desiring today's price at the end of the process), use a short hedge.**
- **To guard against prices rising (having promised a future delivery at current price), use a long hedge.**

So if you're planning to grow some Soybeans ready for December, but want today's price, you can hedge your purchase by taking a short futures position. Then, if prices fall your losses on the sale of the crop are cancelled out by gains made in the futures market (it may help to think of this as honouring the short future by using your own soybeans; although in reality the transactions would be unrelated, as you close the future through its exchange and sell your soybeans through your usual cash channels). If instead the prices rise, the extra money you would have made on the Soybeans gets swallowed by the losses you make on the futures market (having to buy a long position at a higher price).

By contrast, if you want to purchase Soybeans in December, you can lock in today's price by taking the long future. In the event of a price rise, the losses on the actual purchase are offset by gains on the futures market; whilst a price fall would save you money on the beans which then gets spent on your deficit on the futures market.

Note that in each case, the prevention of loss arising from price movement in one direction carries with it the prevention of profit should the markets have moved in the originally desired way. Thus there is a loss in the sense of an opportunity cost- the money you would have gained if the hedge was never placed.

Before looking at how the process can go awry, here then is an example of a perfectly balanced hedge (from Lofton [2]), based on grain export. Suppose you have sold 1 million Bushels of corn for delivery in 3 months, having agreed on today's price, $2.85/bushel. Without a warehouse (or due to the cost of using one), it's not possible to buy the corn now at that price, store it, then deliver. So instead you take a long hedge in corn futures, say at $2.96/bushel.

3 months later and as feared the price goes up. You are forced to buy cash corn at $3.10/bushel to meet your obligation, a loss of $.25/bushel. Yet over on the futures market, a price rise to $3.21/bushel means that you have a gain- of precisely the $.25/bushel you needed. In effect, the per-bushel cost of $3.10 you ended up paying is offset by income from the futures market to the tune of $0.25, giving an overall cost of $2.85- that is, the price you wanted to lock in.

The biggest reason why the hedge may fail to protect you is due to the fact that futures prices do not change in lockstep with that of the underlying cash commodity. Thus in the scenario above we could have the price paid for corn going up without a corresponding upturn in the futures market. Provided there was some response by the futures market, the hedge would still have been better than no hedge at all; the discrepancy caused by the differing movement of cash and futures prices is known as a basis change. The reasons for a basis change may be complicated but essentially it arises due to differing influences on the two markets- cash commodities being shaped by supply and demand, whereas futures respond to trader expectation. A futures price may be less responsive to day-to-day cash price fluctuations if it's expiry date is in the distant future, or you may have had to hedge with a slightly different commodity to the one you're working with on the cash market (such as using soybean oil, which has futures, as a hedge for palm oil, which doesn't). This activity, known as cross-hedging, is legitimate (i.e. recognised by the Commodity Futures Trading Commission) for various combinations, but will only be effective if the price movements of the chosen commodity and future have a strong positive correlation. Note that a basis change won't always lead to a loss- if the futures gained even more than required, a profit is obtained.

Beyond this, there are complications arising from the fixed specification of each futures contract- for instance, the Chicago Mercantile Exchange (CME) contract for frozen pork bellies requires 40,000 pounds weight- forcing an overhedge (essentially speculation) or underhedge (leaving commodity exposed) if the quantity you have does not cleanly divide by this figure. At any given time, several futures in a commodity may be traded- each with differing expiry dates, and hence requiring careful selection. Finally, brokerage fees, storage costs, insurance etc. may all be incurred without an offsetting gain in the hedge.

These days futures are not just based around commodities; indeed the most popular ones are linked to financial instruments such as a stock index or exchange rate. This allows you to hedge not just material assets but investments- if your stock portfolio performance correlates well with the NYSE stock index, a short hedge in futures on that index will protect the value of your

investment; whilst currency futures hedge against fluctuations having an adverse influence on foreign expenditure or income from foreign markets.

These are all examples of static hedging- putting a hedge in place with the goal of minimizing losses or breaking even in the event of exchange rate changes and leaving it there until no longer required. However, if there is a degree of confidence about economic conditions, there may be times when the hedge would best be set aside so that it doesn't cancel out profits made possible by a successful prediction. This variation of hedging level based on economic forecasts is known as dynamic hedging (or portfolio insurance), and offers the dream of never losing money when you're right and nightmares on the scale of black Monday, 1987, when you're wrong:

> *Dynamic hedging, associated with some $100 billion in option replication strategies, caused a US stock market crash in 1987 that wiped out almost a quarter of US equity value and ignited market crashes around the world. Today, the same dynamic hedging underlies hundreds of billions of dollars in institutional and retail products. Similar effects were felt recently when e-trading momentum investors, who were essentially trying to create a costless call option, found themselves paying for it when they all rushed for the exit at the same time. The result was the precipitous decline in tech stocks that rocked the market in early 2000. [1]*

Curiously, hedge funds don't generally exist to set up hedges- rather, they act as speculators on the futures market, taking long or short positions without the equivalent cash commodity interest.

References

[1] *Capital Ideas and Market Realities: Option Replication, Investor Behavior, and Stock Market Crashes*- Bruce I. Jacobs; quote drawn from synopsis at *http://www.cimrbook.com/cimr/flapcopy.html*

[2] *Getting Started In Futures (Third Edition)*- Todd Lofton ISBN 0-471-17759-8