

Why Be Average?

We all get what we want from the market. This cold statement applies to all of us, winners as well as losers, speculators as well as hedgers, scalpers as well as long-term traders. The latter pair of traders have a difficult time understanding one another. Commercial hedgers frequently regard short-term speculators as destabilizing influences upon the market, while speculators view commercials as ponderous and inefficient players who frequently ignore what appear to be easy trading opportunities.

These mutual opinions are irrelevant: both classes of traders have vastly different time horizons, periods over which their economic concerns extend. For example, natural gas has extreme price moves and volatility, (see "It's A Gas," *Futures*, June 1997) but it would be inappropriate for an electric utility or a fertilizer plant to worry about these short-term fluctuations when constructing a plant with a thirty-year economic life. Daily price fluctuations may be important for the utility's fuel buyers in handling peak-load demand, but any plant whose construction decision is dependent upon these considerations is probably not economic.

Financial markets have long been very efficient in allocating capital across different time horizons; the classic example is savings & loans borrowing from short-term depositors and lending to long-term mortgagors. The OTC derivative market is already very efficient in financial markets and is becoming very efficient in managing longer-term risks in physical commodity markets as well. These burgeoning OTC markets are by no means a "threat" to exchange-traded markets if OTC traders find the futures useful: would the Eurodollar contract be so successful in the back months without hedge demand from swap traders?

Agricultural Opportunity

Cash market options on agricultural commodities have been illegal in the United States since 1936, despite the fact that traders in other physical markets, such as energy and metals, have been free to trade cash market options as they see fit. Commissioner Joseph Dial of the CFTC, a body only occasionally noted for its deregulatory instincts, has been spearheading an effort to lift this ban; at the early August time of this writing, it appears that the ban could be lifted by early October.

What sort of instruments might be popular among grain traders? The list includes:

- **Average price** or "Asian" options. Unlike the American options commonly traded on futures exchanges, the value of this option is determined not by a single price at expiration, but by an average over a pre-specified period. On the surface, these make a lot of sense for an industry characterized by producers famously reluctant to call a top and by consumers whose needs are continuous and whose profit margins are determined largely by costs.
- **Barrier** options, which are options which become active ("knocked in") or inactive ("knocked out") when a barrier price is reached; they are conceptually similar to a stop order except that the underlying instrument is a cash option and not a future. These are useful to commercial players able to pass on price moves within a range, but who will be hurt beyond that range.
- **Compound** options, which are options on options. For example, a cattle feeder may wish to buy a put on a call, which would give him the right to sell the writer a call option during a price surge. In a 1996-type market, where cattle feeders liquidated herds and sold corn back to the market, these options would have been very useful.
- **Lookback** options, which give the buyer the right to buy or sell at the best price over a period. These are for those who really, really want to get what they want from the market.
- **Rainbow** options, which give the buyer the right to choose the most economic alternative between two assets. For a poultry feeder who can choose between corn and soymeal, the benefits are obvious.

- **Spread** options, which could be used to trade relationships such as the soybean crush or the beanoil as a percentage of product value spread.

The number and variety of customized options is dizzying and is limited only by the creativity of the trading partners. Since the Asian options have the greatest utility for the agricultural industry, and since at least one exchange, the London Metals Exchange, offers this class of option, these instruments will be our topic.

Playing The Averages

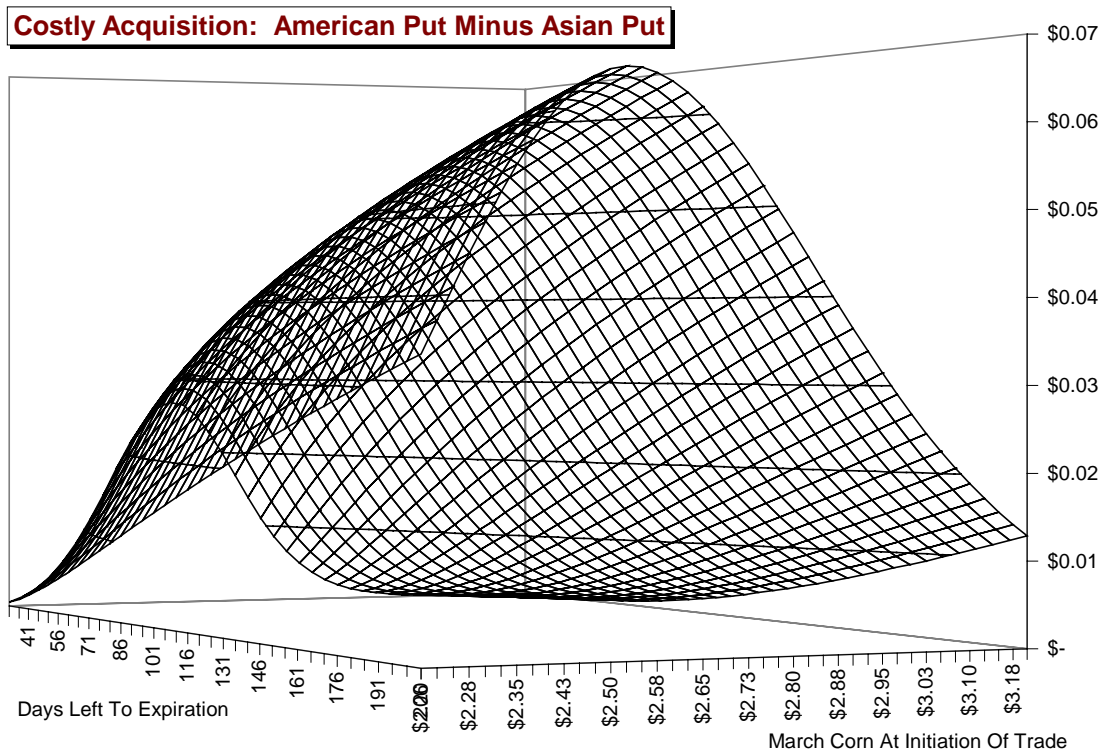
Averages are divided into two broad categories, arithmetic and geometric. The arithmetic

average of a series X is given by: $\frac{1}{N} * \sum_{i=1}^N X_i$, the sum of the observations divided by the number

of observations. The geometric average of a series X is given by: $\left[\prod_{i=1}^N X_i \right]^{\frac{1}{N}}$, or the Nth-root of the product of the series. Geometric averages diminish the influence of extraordinary observations in a large series of prices. The discussion below will focus on geometric averages.

Let's posit a problem. A grain elevator buys corn at a fixed price and will store it through March 1998. There will be 206 days left on the hedge, March option volatility is 21.93%, the risk-free rate is 5.2%, and the elevator's desired protection level is \$2.50 per bushel, against a current price of \$2.70 per bushel. How do Asian options compare in this instance to the American options offered on the Chicago Board of Trade?

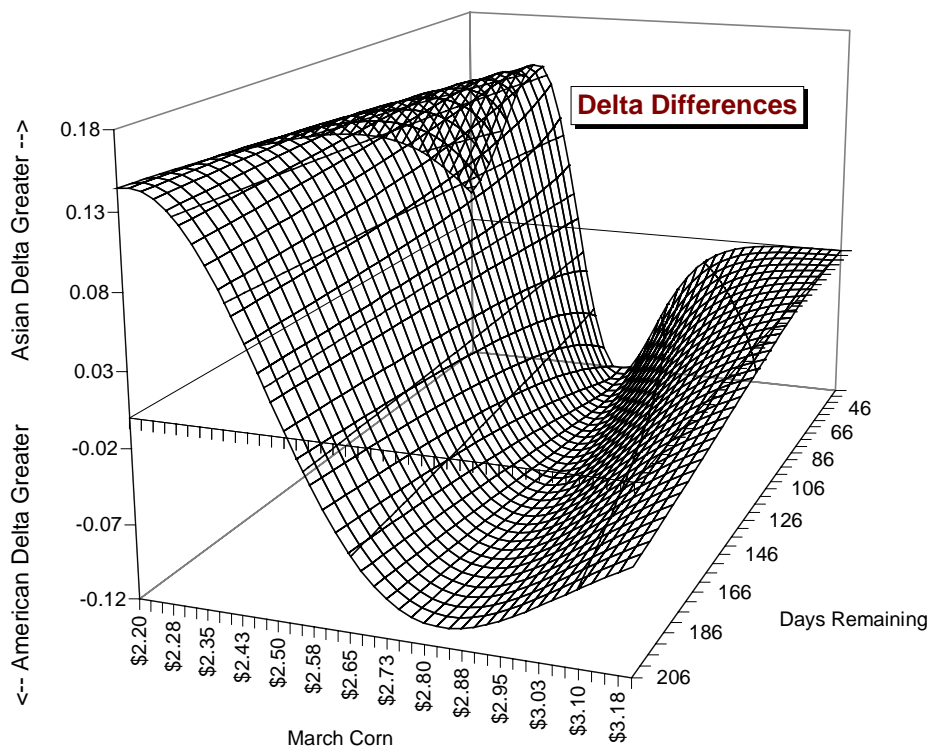
First, there is the matter of price. The Asian will trade for about \$0.03, while the American will trade for about \$0.09. This price difference increases with time remaining to expiration, as shown in "Costly Acquisition."



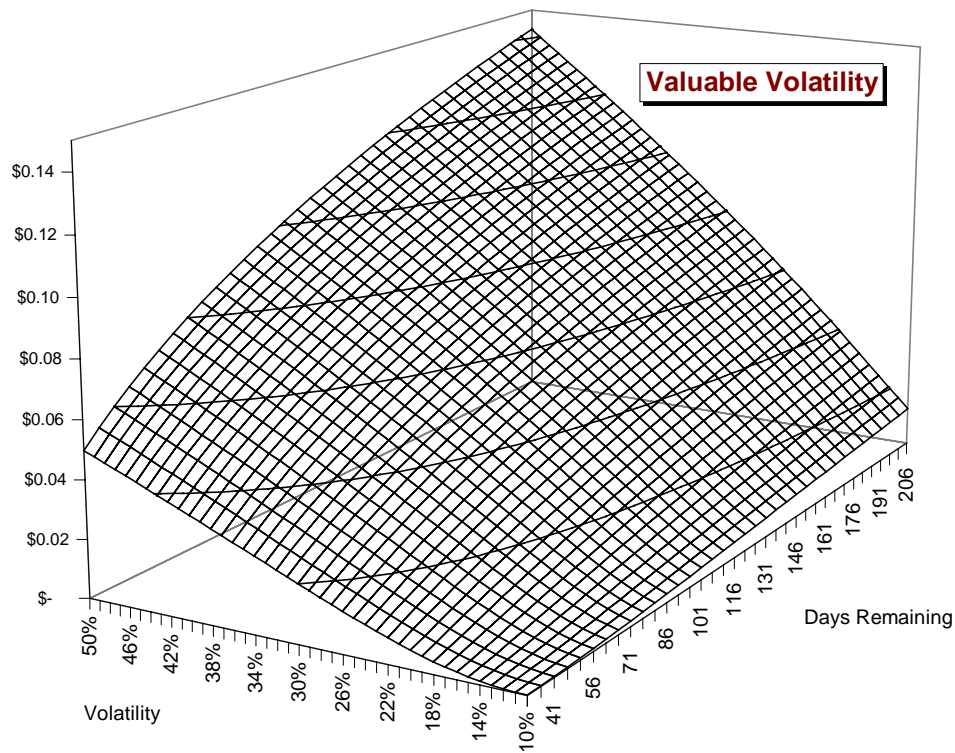
If there's no free lunch, does the converse hold true: Do you get more by paying more? Or, more generally, what are you buying for your extra \$0.06? Telling people that it's somehow good to pay more for an option is like telling people that it's good to pay lots and lots of capital gains taxes because that means you have made lots and lots of money. Both statements fall into that true-but-unwelcome category so beloved by free market economists and other perennial losers of popularity contests.

First, let us recall the key property of an American option, that it can be exercised at any time up to and including the expiration date. The owner has the right to sell it at any time for any reason, including favorable price spikes and surges in volatility. Moreover, the future price path is of no concern. The owner of an Asian option has the right to either wait until the end of the averaging period to see what his option is worth or to write another Asian option during the interim in order to protect gains. The latter course of action should be recognized by one and all as a dangerous invitation to over-trading.

Second, an American option's delta expands more rapidly than does that of the Asian option over the critical price zone near initiation, especially when there is a lot of time left, as seen in "Delta Differences." The delta of the Asian options approaches unity (-1 for puts, 1 for calls) faster only after a major price move has occurred or when there is only a short period of time left. The ability to match the delta of a hedge position, which also maximizes the gamma of the position, is absolutely critical to option-based hedging strategies (see "Why Johnny Can't Hedge", *Futures*, November 1996).



Third, the Asian option smoothes out one of the greatest values of an option, its reaction to volatility spikes; this is especially true for geometric smoothing. As seen in "Valuable Volatility," if we hold price at a constant \$2.70 and measure the difference between the American option and the Asian option over a wide range of volatility and time, we see that the American option will always have an advantage over the Asian option.



We're All Above Average

We have ignored several other factors in favor of exchange-traded American options, such as credit risk, price transparency, and transformability into liquid futures. None of these factors are trivial. These factors, along with the ones described above, suggest that we do get more by paying more. Why, then, are Asian options increasingly popular in energy and metals markets?

The answer lies both in cost and in a variant of the time horizon issue discussed in the Introduction. The cost issue speaks for itself, with an interesting psychological twist. Traders are not the perfectly rational, profit-seeking automatons we imagine ourselves to be. For example, we are risk-seeking in the domain of losses – who hasn't held on to a small loss in the hope that it will turn around – but we are risk-averse in the domain of profits, and frequently rush to cash in our gains too early in the fear that they will disappear. As this pertains to options, we detest the notion of paying money for an asset that could disappear into thin air, but we are frequently willing to accept open-ended risk as option writers. Anything that can give us "cheap" insurance protection against a catastrophic move is appealing.

The second reason, the variant of the time horizon issue, also extends past the obvious, that large commercial users have longer time horizons than does your friendly market-maker. Commercials also have profit margins that can absorb adverse price moves, or, they may be able to pass on these adverse price moves to customers, suppliers, employees, and investors. Why should a business – and any successful business is predicated upon the prudent acceptance of risk – pay for a lot of insurance when only the most basic margin protection is necessary?

The opportunities to link these two trading needs, the longer-term, less-sensitive needs of the commercial with the short-term, highly-sensitive needs of pure traders, will present tremendous growth opportunities for the entire trading community if managed properly.