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A MATHEMATICIAN ON WALL STREET

Statistical Arbitrage - Part IV

Life's turns bring both simplicity and diversification with two new and more powerful approaches to statistical arbitrage

Princeton-Newport Partners began winding down in late 1988 and closed operations in 1989. Amidst the stress, our brains in California were hyperactive and we developed not one but two new and more powerful approaches to statistical arbitrage. But after Princeton-Newport Partners closed I wanted simplicity. We reduced to a small staff and focused on two areas: Japanese warrant hedging[1] and investing in other hedge funds. Both went well.

Meanwhile I was sitting on new market neutral statistical arbitrage methods for beating the market that I wasn't using, and had no immediate plans to use. I expected that continuing innovations by investors using related systems would, as is typical, gradually weaken the power of my methods. During this period, in 1991, I met with John Casti, mathematician, author of several well known science books,[2] and a charming and imaginative intellect. He was associated with the Santa Fe Institute and thought it would be mutually beneficial for me to visit the Institute, give some talks, and interact with the distinguished group of people that congregated there. In addition to people like Murray Gell-Mann, Nobel Prize winner in physics, I'd finally meet "maverick" physicists[3] Doyne Farmer and Norman Packard. Their roulette adventures were chronicled by

Thomas Bass in his book *The Eudaemonic Pie*. They were key founders of the Institute, and its focus was on their area of expertise, complexity theory.[4] Farmer and Packard had just left the Institute to found The Prediction Company, where they were attempting to conquer the securities markets.

In one of my talks, believing I wouldn't be using it again, I was going to reveal how statistical arbitrage worked. But as it happened, I didn't make the trip.

Tales of wondrous returns, a friend's urging, and a giant investor

Meanwhile, both good friend Jerry Baesel and a former giant investor from Princeton-Newport Partners came to us with tales of extraordinary returns from statistical arbitrage. Among the various operators were D.E. Shaw and company, still other former Morgan Stanley quants whose shops were springing up like dragon's teeth, and some of my former Princeton-Newport Partners associates. I asked several of these former Morgan Stanley people, then and in subsequent years, if they knew how statistical arbitrage had started at Morgan Stanley. No one did. Only a couple of them had heard rumors of a nameless legendary "discoverer" of the Morgan Stanley statistical arbitrage system, who, presumably, was Bamberger - so thoroughly had recognition for his contribution disappeared.

If our statistical arbitrage system still worked, the giant investor - a multibillion dollar pension and profit sharing plan - was able to take up most or all of the capacity. Note that every stock market system is necessarily limited in the amount of money it can use to produce excess returns. One reason is that buying underpriced securities tends to raise the price, reducing or eliminating the mispricing, and selling short overpriced securities tends to reduce the price, once again reducing or eliminating the mispricing. Thus systems for beating the market are limited in size by the impact of their own trading.

Period of adjustment

By 1991, I had finally simplified to a small staff of just four people. Steve Mizusawa was hedging Japanese warrants, with some theoretical assistance from me. I was working with Steve and also managing a portfolio of hedge funds for myself, with help from Judy McCoy, who also was in charge of tax and financial reporting, helped Steve, and backed up Diane Sawyer, our office manager at the time.

Life was good and I was rich; I had more time to travel, vacation, read and think, and enjoy my family. I was ambivalent about returning to the investment hubbub, so I tried what I thought

would be a time-efficient way to cash in on our statistical arbitrage knowledge. I discussed with Steve, who would be crucial in implementing any such venture, how to proceed. I went shopping for a partner to whom we could license our software for royalties.

I contacted Bruce Kovner, a wealthy and successful commodities trader who I knew from Princeton-Newport days. Kovner had started with the Commodities Corporation in the 1970s, then gone on to run his own commodities hedge fund, eventually making hundreds of millions for himself and more for his investors. On the *Forbes* list of the 400 wealthiest Americans since 1992, he was estimated to be worth $900 million in 1999.[5]

Jerry Baesel and I spent an afternoon with Bruce in the 1980s in his Manhattan luxury apartment discussing how he thinks and how he gets his edge in the markets.[6] Kovner is a generalist, who sees connections before others do.

About this time he observed that large oil tankers were in such oversupply that the older ones were selling for little more than scrap value. Kovner formed a partnership to buy one. I was one of the limited partners. Here was an interesting hedge. We were partially protected against loss on the downside because we could always sell the tanker for scrap. But we had a substantial upside: Historically, the demand for tankers had fluctuated widely and so had their price. Within a few years, our refurbished 475,000 ton monster, the *Empress Des Mers*, was profitably plying the world's sea lanes stuffed with oil. Later the partnership negotiated to purchase the largest tanker of them all, the 500,000 ton *Seawise Giant*. Unfortunately, while we were in *escrow* the ship unwisely ventured near Kharg Island in the Persian Gulf and Islamic artillery rendered it unsuitable for delivery to us. *The Empress*, however was operating profitably in the twenty-first century and paying me dividends. I liked to think of my part ownership as a 20 foot section just ahead of the forecastle.

The saga of the *Empress Des Mers* finally ended. A letter dated June 3, 2004 reports:

"Today the *Empress* ended her many years of service when she was steamed up on a beach in Chittagong, Bangladesh. Tomorrow she will begin to be cut up for scrap. This sad day occurred

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many years earlier than it should have due to severe changes in the tanker market and international regulations. Nevertheless, the *Empress* once again performed in the profitable manner that she has so often throughout her career. Scrap prices are at historic highs, which resulted in the *Empress* fetching almost 23 million.

Since we purchased the *Empress* almost 18 years ago, the ship has generated approximately 100 million dollars in trading profits and provided a return on investment averaging some 30 per cent annually. This single ship has out performed almost all other tanker companies over the period."

Kovner referred me to a hedge fund in which he was a major investor, and I made a proposal to the general partner (GP). We would supply the software for a complete operating system and license it to the GP for 15 per cent of the GP's gross income from the use of the product. I chose gross income to simplify the process of monitoring and verifying correct payment. We would train them and provide continuing counsel. The license fee also declined slowly over time to adjust for improvements they might add and for the obsolescence of the original system. But every time we agreed on a deal, the GP insisted on making yet another change in his favor. After agreeing to some of these, it became apparent that they were endless. My patience at an end, I terminated negotiations.

The economics of haggling

Most of us who have dealt with used-car dealers, with rug merchants, or who have bought and sold real estate, are familiar with a negotiation process perhaps best described as haggling. To illustrate, suppose a house you want is priced at $300,000. You offer $250,000. The seller counters at $290,000. You counter at $265,000, etc. Finally you agree to buy at $275,000. This stylized dance may involve cajolery, trickery and deceit, which you might be familiar with at the used car or rug buying level.

Wouldn't it be simpler and more satisfying, as Warren Buffett prefers, for the seller to state his price and have the buyer take it or leave it. After all, that's how it's done in most stores in the U.S., isn't it? How could you shop if the prices you compare aren't firm?

Yet in business deals or "negotiations," haggling is common, just as it was with the GP who haggled with me. What's going on here? We'll address that next time.

REFERENCES

1 See *Forbes*, November 25, 1991, pp. 96-99, "A Three Time Winner," Risk Arbitrage in the Nikkei put warrant market of 1989-1990. *Applied Mathematical Finance* 2, 243-271 (1995).
2 Among them, Complexification and Reality Rules: Picturing the World in Mathematics, Vols. I, II.
3 So described by Thomas Bass in his book *The Predictors*, which tells the story of their attempt to beat the market.
4 See, for example, the books *Chaos, the Birth of a New Science* by James Gleich and *Does God Play Dice: The Mathematics of Chaos* by Ian Stewart.
5 *Forbes*, October 11, 1999, page 352.
6 See Schwager, 1989, pp. 51-83 for a long interview with Kovner.

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