

Q-Group Dinner Speech, Ocean Reef Club, Key Largo, FL, April 3, 2005

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MY first talk at Q was in the fall of 1980 at the Silverado in Napa Valley, CA – 25 years ago, making this my quarter-century reunion!!

As long ago as 25 years is, Q is even older; I am told it goes back to 1966. Of course I do, too. More about that later.

In 1980 I discussed the then new idea of using Monte Carlo simulation of asset and liability joint returns to choose pension asset allocation policy. Many years later Bill Sharpe's company Financial Engines made the idea of MC simulation popular and just last month the SEC began allowing its use in promoting mutual funds. Around that same time, Jack Treynor wrote that the idea was irrelevant to pension decision making since the pension fund was just another component of the corporation and shouldn't have a separate financial policy.

Five years later, 1985, I was invited back to Q and discussed put-replication strategies or Portfolio Insurance for equity risk management. That idea spread rapidly and was part of the cause of the 1987 stock market calamity.

Prior to forming the company that popularized PI, Leland O'Brien Rubinstein or LOR, I had lunch in a NY steak house with Jack Treynor, sometime in 1979, and asked him what he thought of the idea of put replication portfolio insurance . As I recall he said it was a wonderful idea, but its potential benefit might be undone by its absolute necessity to trade at specific market levels. I said PI would have to get awfully large for that to be a problem – well, it did and indeed there was a problem!!

After a respectable 20-year lay-off, I was asked to come back to talk broadly about financial engineering. I want to talk a little history and then do a little wishful thinking about the future. I will avoid talking about the present; you all know too much more than me about that!.

First, three news items about my presentation:

1. I carefully prepared 30 power point slides totaling 90 minutes of dense information
2. But I am told slides can't be used in this dinner setting
3. 25 years ago, the lack of power point would not have been a problem – in fact there was no power point – but since then I have lost about 2/3rds of memory- recall cells, and so my 90-minute presentation collapses to about 30 minutes, with unintended repetitions and senior moments, maybe 40 minutes.

I brought along a timer to enforce the 40 minute discipline. It goes-off after 25 and 35 minutes as well as 40. You can leave when you wish, I will stay till the final bell.

Overwhelmingly the advice I got about giving this dinner talk was to keep things light and to tell some jokes. We have all sat through technical people like me telling funny stories that they try in some torturous way they try to relate to their main topic. I will spare you that. But I have come across some funny stories having nothing to do with FE, so for openers let me try those.

[I TOLD SEVERAL JOKES, OMITTED HERE]

Now, back to the topic of the night.

Many things in life are random; perhaps none more random than when, where and to whom we are born. Yet those three random variables are overwhelmingly important in determining one's life. Robert Shiller of Yale calls the risk and reward associated with such randomness "gratuitous"; that is to say, it is not something that arises through our own effort. He and others Merton and Bodie in particular, suggest that a useful objective for society would be to find ways to mitigate gratuitous risk – a form of societal financial engineering or risk management.

I will conclude by discussing some roles financial engineering could play in societal risk management. But first, I would like to trace how gratuitous events have shaped my life in financial engineering, and thereby give one introduction to early financial engineering.

Think of financial engineering as a river formed from a series of headwater-streams. I can take you down one of those streams, but remember there were many others, and I have a view of early financial engineering biased by the stream that I traveled.

My professional career gratuitously began coinciding with the 1960's convergence of math, physics, computer science and operations research, and the entry of the "rocket scientist" into finance.

The term rocket scientist described engineers and scientists that either became disillusioned with the aerospace industry, or had lost their jobs as that industry began contracting in the 1970s. Many of these people just happened to be in California, had no Wall Street rolodex, and were generally clueless about finance or market dogma. So they trained their sense of the scientific method on finance.

I was one of those people. In May 1962, I was discharged from the air force in Los Angeles and landed a systems engineer job with a young firm – Planning Research Corporation -- founded by some break-away Rand Corp. execs. The company required all employees to have secret clearances; so, when you first joined you were processed-in and required to stay for a week or so in a small office with 3 or 4 other newbie's awaiting clearance.

One of my fellow newbies, gratuitously, was Gil Beebower. He was Cal Tech from Santa Monica, CA; I was MIT from the Bronx, NY. Gil and I introduced each other to quantitative finance, and have worked closely since. But we switched coasts; Gil becoming a New Yorker and me becoming a Californian.

In 1965, an especially gratuitous event occurred – Planning Research was dissatisfied with its profit sharing plan results and decided to set one its young systems analysts to find the problem. Lucky me was selected.

Planning Research gave me a small budget and I contacted Bill Sharpe for help. That was the one year he spent at UC Irvine -- a hilltop in Irvine, CA. I learned the capital asset pricing model from one of the masters.

Planning Research liked risk-adjusted performance analysis and gave me a budget to market the idea to California pension funds.

At this same time, mid-60's, around the country, quantitative analysis was making itself felt in finance. The Computer Applications Committee at NYSSA; Q-Group; CRSP; and Jack Treynor at the FAJ are key examples.

In 1968, the west-coast partner of a NYSE research firm by the name of Oliphant & Co asked me to create an analytical services division to offer performance measurement and risk analysis services to mutual funds and pension funds.

At Oliphant, I hired Dennis Tito, Gil Beebower, Lou Kingsland, and Gifford Fong and we created a pioneering analytical services business. Barr Rosenberg invited us up to Berkeley to tell his grad seminar about beta; beta was slowly creeping into to finance lexicon.

In 1969, at Oliphant we created the world's first beta book. This annoyed the analytical group at Merrill Lynch; it claimed that it had better beta's – a tongue-twister.

The NYSE, Computer Applications Committee, arranged a "WHO HAS THE BETTER BETA" shoot-out at 15 Williams Street on Nov 19, 1971.

Anyway, I presented for Oliphant, Dennis Tito was my "second", Gil Hammer and Larry Tint represented Merrill. It was great fun and afterward we all had a party at the apartment of another Merrill quant – Cathy Higgins.

Interestingly, Bob Ferguson moderated that '71 debate, and Jack Treynor and Marty Leibowitz were on the debate panel.

Both Oliphant and Merrill won that debate. Wall Street loves a fight, and although Wall Street didn't care about beta, it did care who had the better ones!! So, we both began to sell a lot of Beta's, and eventually lots of other analytical services, too. In fact, that was the initial realization that there was value in, and real money to be made from, analytical services.

1971 is the year one might reasonably assign as the birth of financial engineering. It represented the year the commercial world began to accept financial science – the CAPM, options pricing and index funds. More later on these.

Back at Oliphant, money was the root of evil. As Oliphant began to make big money in analytical services, disagreements developed between the traditional fundamental research analysts and us new quantitative analysts.

The traditionalists won in 1972 and I was fired; Tito, too. We formed O'Brien Associates and soon the rest of the team from Oliphant joined O'Brien Associates. The company pioneered many interesting things. In 1974, it introduced the O'Brien 5000 Stock Index. In 1975, I sold the company to Tito; the company and Index name were changed to Wilshire – the street on which the company lived.

Other important CA based financial engineering events of the early/mid 70's were the formation of Gifford Fong Associates, Barr Rosenberg Associates, now BARRA, and the Wells Fargo MPT seminars leading to the birth of the Index Fund; Mac McQuown and Bill Fouse figured prominently at Wells Fargo in Indexing. Who would have imagined in 1972 the index mutual fund and index ETF market we have today?

The other big event of the 70's was the development of the Black-Scholes-Merton options pricing formula. That led to another "who could have imagined moment".

Many of us here today can trace our jobs to index funds, Index ETFs, or some derivative activity of Black-Scholes-Merton.

There will be several papers at this Q about ETFs and I would like to present a short historical preface for that development, since I believe the initial instant history has it wrong. The beginning of the story is 1987.

Blame for the stock market crash of 1987 largely was laid at the doorstep of portfolio insurance and the company Leland O'Brien Rubinstein, LOR, PI's developer, and main supplier. The true and complete story of portfolio insurance is for another time, but the ETF was born out of the crash of '87: it was not a coruscation at the American Stock Exchange.

In 1988 Hayne Leland, Mark Rubinstein, and I sat down to assess what happened in 1987 and what we could do about it. One easy conclusion was that the market had moved from exclusively stock trading to largely portfolio trading, but effective portfolio trading technology had not developed. We also concluded that long-term, collateralized put and call options were needed.

Based on our needs analysis and what we knew about finance, we decided that a modification of Nils Hakansson's Super Fund idea was what we needed. That idea itself rested on the contingent security and complete market ideas of Arrow-Debreu.

In its final design, LOR's SuperTrust contained two ETF's one an S&P 500; the other based US treasury notes. The ETF's were each separable; altogether one could create S&P calls, puts, covered calls and covered puts — and they were all 100% collateralized by the trust assets.

Getting SEC approval for the SuperTrust took LOR from 1989 till 1992, and cost it 8 million dollars. LOR selected the American Stock Exchange to list the SuperTrust ETFs. They began trading on the AMEX in late 1992.

AMEX shadowed LOR's SEC filings with an identical S&P ETF without the separation features of the LOR product. Three months after LOR's SuperTrust launch, AMEX launched the less complex SPDRs. The KISS principle – keep it simple stupid! -- won again.

For the record -- SPDR was the second ETF. However, we were reminded that, "The early bird may get the worm, but it's the second mouse gets the cheese!!" Time is running short; let's turn to the future. I would like to suggest some areas where financial engineering could make contributions beyond slicing-and-dicing of important but narrow risks facing all individuals. I am not predicting these will be the wave of the future; only that I hope they will.

The issues I will mention were initially introduced by either Merton, Bodie, or Shiller; I only am a synergizer and evangelist. For a full discussion I refer you Bodie's book: Risk-Free Investing; Merton's Bachilier Congress 2000 Address, and Shiller's book: A New Financial Order.

Five areas I find potentially useful are:

1. Life-cycle Investment Planning
2. Livelihood Insurance
3. Home Value Insurance
4. Inequality Insurance
5. Intergenerational Wealth Sharing

These five opportunities are reviewed in the accompanying PowerPoint presentation.

Well, that's it for tonight. Let me close with a line I love from the movie "Garden State" -- "Explore your infinite abyss".