Adventures of an Academic in Asset Management

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A few “street creds”

I am an academic...

• Harvard/LSE/Harvard; Stanford/Berkeley (Haas)
• Past president of American Finance Association (1997)
• First recipient of Stephen Ross Prize 2008

But have had considerable real world experience

• Advisory boards of CBOE, Goldman Sachs, Wells Capital Man.
• Trustee, Barclay Global Investors Mutual Funds
• Founder and principal, Leland/O’Brien/Rubinstein (LOR)
• Fortune magazine “Businessman of the Year” (1 of 12) 1987
• Principal of Home Equity Securities (HES)
The Adventures: A Preview

Adventure 1: Creating a New Financial Product

Adventure 2: Creating a Market Crash

Adventure 3: Creating the First ETF

Adventure 4: Creating Another New Financial Product: Shared Home Equity
Adventure 1: *Creating a New Financial Product*

• The idea: *portfolio insurance*
  – Why it was needed for portfolios
  – Insurance on individual assets vs. portfolios
  – Why it hadn’t been done (before 1976)
  – The academic advantage
    • The association of insurance with a “put option”
    • Black-Scholes option valuation approach
A Primer on Put Options

A **put option** is a financial contract that specifies:

- An underlying instrument (e.g. a stock or portfolio) whose value today is denote $S_0$ (e.g. AAPL = $275/shr)
- A horizon or maturity date $T$
- A “strike price” $K$
- A (risky) payment $C_T$ to the buyer at $T$ equal to:
  
  - $0$, if at maturity final stock value $S_T > K$
  - $K - S_T$, if at maturity $S_T < K$ \quad \text{(i.e. Max (0, } K - S_T)$

Thus buying a put option on stock gives an insured value $K$:

$$S_T + \max(0, K - S_T) = \max(S_T, K)$$

Cost of put option insurance, $C_0$ , determined by market
But there were no portfolio options to buy!

- Options on individual assets have traded since ancient times (see Peter Bernstein, *Against the Gods: A History of Risk*)
- Call options on individual stocks traded from 1973, but put options not traded until 1977.
- When LOR was formed in 1980, there were no portfolio (or “Index”) options traded.
  - Index options were introduced in 1983, but were relatively illiquid until well after 1987. Short time horizons
- So no way to implement portfolio insurance despite need
An academic advantage...

In 1973, **Black & Scholes’ famous option pricing article** published

- Showed how to **value an option** by the fact that it could be continuously hedged by an offsetting, but changing, stock position:

  \[
  \text{Option minus (changing) stock position} = \text{(changing) riskless asset position}
  \]

- But we realized this argument could be reversed:

  \[
  \text{Option} = \text{changing stock position plus (changing) riskless asset position}
  \]

- **So we didn’t actually need put options for portfolio insurance!**
  - Could continuously adjust funds between the underlying portfolio and a riskless asset (Treasury (discount) bond with maturity \(T\))
  - Arbitrary maturity \(T\) and level of protection \(K\!\)

- **NATURE OF THE DYNAMIC STRATEGY:**
  - Sell stocks as value of portfolio declines, buy as value rises
From idea to market (with a little luck...)

I quickly teamed up with colleague Mark Rubinstein

- Simulations showed idea worked well
- But our pathetic marketing efforts came to naught

We then teamed with John O’Brien, an industry pro

- Tough to get first client, but did in 1980 ($500K!)
- By end of 1980, $135m
- 1983: move to hedging with index futures; rapid growth
- By early 1987, $25b +$25b licensed to Wells, Aetna
By mid-1987, some sleepless nights

> Market had increased volatility
> If market fell by 3%, we would double NYSE volume!
> Should we refuse clients?

Markets becoming sensitive to portfolio insurance trading:

> Headline below– note date!

**Portfolio Insurance Helps Investors but Hurts Market**

THE WALL STREET JOURNAL
Oct 19, 1987 (before market opened)
Adventure 2: The 1987 Crash
**On October 19th...**

Previous Friday (Oct. 16th) had seen large (4%) decline in DJIA

- Learned over weekend LOR had not been able to complete hedging
- We (and others) would have to sell at start of Monday the 19th
- Agreed to meet at our office in LA

Things didn’t seem too desperate as I started flight to LA

- Market was down 60 at open, but stale quotes at open
- By arrival in LA, market down 250 (about 1,200 points today)
- Our trader says “falling behind, market will go to zero if sells required”
- Futures detach from stocks as arbitrageurs fall out
- Calls from SEC

End of day market down 508 (roughly 2,400 points today)

- LOR trader says he was able to sell only 1/3rd of needed amount
On October 20th...

We have a dilemma: do we increase our hedge selling to get back to where our hedge should be?

- In favor: if further declines, provide more protection
- Against: Futures still selling at substantial discounts; greater losses relative to promises if futures recover
- Decision: protection is why we were hired

At beginning, market recovered somewhat
- We were selling throughout day.

But then collapse, temporary halt of futures trading, recovery
- Market ends flat, but we’d raised hedges to almost level required
On October 21st ...

Market recovers substantially, then seems glued in place
  – Overheard: “The government’s trader has arrived, we can all go home”
  – That’s illegal, but....

Our accounts have losses from upswing
  – Clients alarmed because they’ve lost cash on future’s recovery
S&P 500 index around the time of the crash

5-minute intervals

- Commerce report on trade deficit
- Reports that a House committee filed legislation to eliminate tax benefits associated with financing mergers
- 9:30 NYSE opens but many prices stale
- 1:09 News report of SEC Chairman's comments
- 8:41 (line at 9:30) Federal Reserve announcement
- 11:45 CBOE suspends trading
- 12:15 CME suspends trading
- 1:04 CBOE & CME reopen

Source: Market data.
Did LOR cause the crash?

*No.* Portfolio insurance is a reactive strategy

*But* did it substantially *exacerbate* the crash?

- Portfolio insurance did about 15% of total $ stock+futures trading
- Should get 15% of blame?? –but all trading in one direction
- Brady Commission Report says “yes”:

  > In its report, the Brady commission said: "Reactive selling by institutions, which followed portfolio insurance strategies and sought to liquidate large fractions of their stockholdings regardless of price, played a prominent role in the market break." NYT January 9, 1988

My thoughts...

LOR’s PI business dried up in the following months.

- But PI is alive and quite active, but now largely provided by banks...
  
  “Protected unit funds” “CDs with guaranteed minimum return” “ETNs”
Some Hindsights

1. Not hard to get into money management
   • Little capital equipment needed to run
   • Series 3 test on futures; FINRA reporting requirements

2. Markets not as liquid as thought
   • LOR and clients sold 0.2% of market cap
   • Yet market dropped 22%
   • Potential buyers stood on sidelines
     • Problems with information asymmetry and liquidity
     • Gennotte-Leland AER 1990

3. Positive feedback loops from “forced sales”, leverage
   • Typifies 1929, 1987, LTCM, perhaps “flash crash”
Adventure 3: *Developing the First ETF*

After the crash, we saw need for a financial product that
- Provided portfolio insurance
- Required no dynamic hedging
- Was fully collateralized (i.e., held securities that fully backed promises)

Clear that we would need a tradable underlying “stock basket”
- To serve as collateral for contingent securities issued
- Must be tradable during the day as well as end of day for tracking

Problem with US security laws (1940 Investment Co. Act)
- An open end fund is traded only at the end of the day (at NAV)
- A closed end fund is traded daily, but value can diverge from NAV
- Only route was to appeal for exemption to SEC—LOR not popular!
The SuperTrust

A related group of funds that issued securities

1. Fund that held S&P 500 stocks (tracking index)
   – Maturity 3 years
   – Issued Units (like owning S&P index fund, but traded intraday)
   – Units could be divided into two SuperShares (“tranches”)
     • First had claims to final value of stocks **up to 125% of initial value**
     • Second had claims to any value beyond 125%. Like call option.

2. Fund that held Treasury bonds (3 yr. maturity)
   – Issued Units also divisible into two pieces
     • First had claim to value equal to decline in S&P 500 Units (insurance)
     • Second had claim to remainder (provided high income if S&P did OK)
Legal and Moral Issues

Legal Issues:
- 3 years to get through SEC, high legal fees
- Eventually got series of approvals and launched in 1993
  - But imposed “options qualified investors” for Units as well as SuperShares, brokers refused to carry, low trading
- Problem of licensing S&P name from S&P
  - Insistence SuperShares be traded on CBOE, not AMEX

Moral Issues:
- AMEX promised support for marketing SuperTrust but never did
- Started “back up” trading because of delay
  - Promised that would be withdrawn if we got to market
  - Piggy-backed on our SEC approvals
- Less complex Unit did not require options qualification
- Despite our launch 3 months before, they still launched “SPDR”
2011: More than 1,000 ETFs, Assets now $1.1tr
Lessons from Adventure 3

The ETF is a good idea (and now is Wall St. darling)
  – But originators often don’t get things exactly right
  – Would have been nice to patent, but impossible in 1993

Don’t be naïve and believe unwritten promises
  – AMEX trying to rewrite history (successfully). Wikipedia:

  “In 1993, State Street, in cooperation with American Stock Exchange, had launched Standard & Poor's Depositary Receipts (NYSE Amex: SPY) (now the 'SPDR S&P 500'), which were traded in real time and tracked the S&P 500 index. This was the first ETF to trade in the United States, and it continues to trade to this day.”
Adventure 4: *Home Equity Securities*

Q: *What is the most valuable asset that most people own?*
   A: The equity in their homes

Q: *Can this be diversified?*
   A: No. You own either 100%, or 0% (= renter)

Q: *Is there a possible way for homeowners to diversify*
   A: Not yet. It requires a new security ("HEFI")
      > Home Equity Fractional Interest
      > Shares in equity (value after mortgage repay) on resale

Q: *Who would be willing to sell a HEFI (to a bank, say)?*
   A: New homeowners requiring help in downpayment,
       Current homeowners with equity wishing to diversify
The Market for HEFIs

Q: Who would be willing to buy a HEFI?
   A: Banks who will pool and resell them (securitization)
      Investors seeking new asset class (home equity)
      Hedge funds who are speculators

Q: How do these differ from a shared appreciation mortgage?
   A: SAMs combine regular mortgage and equity portion together. We separate, allowing regular mortgage, separate equity ownership to pool.

Q: How will Home Equity Securities (HES) profit?
   A. We have a patent on home fractional interest security!
      > Standard form should lead to liquid market in HEFIs