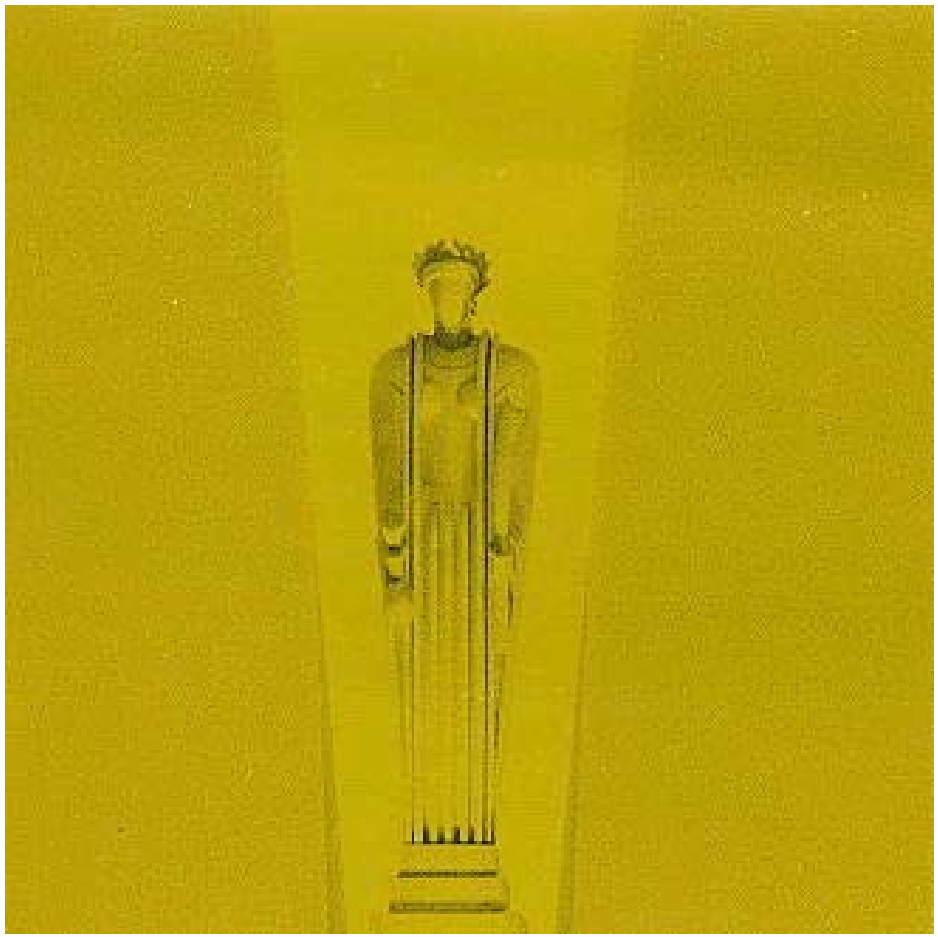
THE ROLE OF THE RISK MANAGER IN THE INVESTMENT MANAGEMENT INDUSTRY



PRMIA
Professional Risk Managers' International Association

Ms. Hilary Till
Premia Risk Consultancy, Inc.
Chicago, IL

November 13, 2003

PRESENTATION OUTLINE

Examples from:

I. Boston-based Mutual Fund Company

II. Boutique Commodity Futures Trading Firm

III. Chicago-based Fixed Income Company

PRESENTATION OUTLINE
(Continued)

IV. Future Challenges

I. Boston-based Mutual Fund Company (1995 – 1998)

The Role of the Risk Manager:

A. First Phase

B. Second Phase

C. Summary

A. First Phase

- ***Motivation: Avoid derivatives problems.***

- **The idea of an independent risk manager was a new concept for the buy-side.**

- **The challenge at the time was to figure out how to adapt the sell-side approach to risk management to the buy side.**

A. First Phase
(Continued)

1. Staffing

- **One independent Financial Risk Manager reporting into the Corporate Treasury, who in turn, reported to the Chief Financial Officer.**

A. First Phase
(Continued)

2. Buy-Side Definition of Risk …

… started with the Prudent Man Rule:

"All that can be required of a trustee to invest, is, that he shall conduct himself faithfully and exercise a sound discretion. *He is to observe how men of prudence, discretion, and intelligence manage their own affairs* …"

- Justice Samuel Putnam, 1830.

A. First Phase
(Continued)

2. Buy-Side Definition of Risk (Continued)

- **Risk was not to be measured in absolute terms but instead, relative to a peer group …**

- **… with an index sometimes proxying for the peer group.**

- **Thus the concept of tracking error, as the primary risk measure, was born.**

A. First Phase
(Continued)

3. Franchise Risk

- **The Risk Manager chaired monthly Risk Management Committee meetings,**
  - **which included investment, accounting, legal, and operations officials;**
  - **the key goal was to deliberate on any matter that might represent franchise risk to the firm;**
  - **the discussions were largely qualitative in nature; and**
  - **included reviewing derivatives activity across the firm.**

A. First Phase
(Continued)

3. Franchise Risk (Continued)

- The risk manager also became responsible for:
  - reviewing all new products at the firm, and
  - creating a formal process for the review of new products.

B. Second Phase

- ***Motivation: Eventually enter into the alternative investment product arena ...***

- ***… and therefore upgrade staff and systems in the area of independent risk management.***

B. Second Phase

(Continued)

1. Additional Staffing

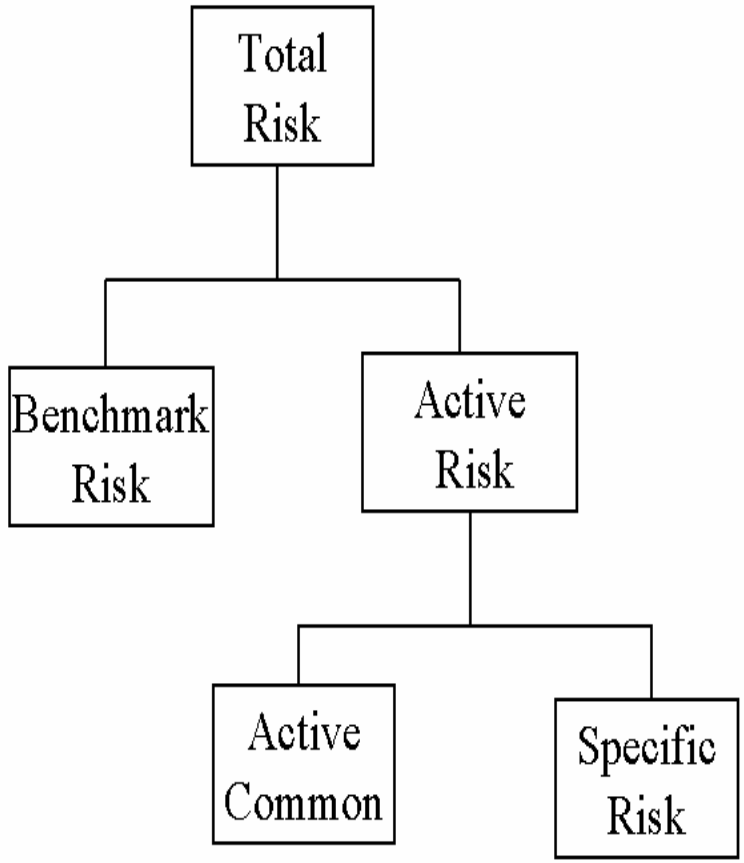
- **Equity Risk Manager, Fixed Income Risk Manager, and a Counterparty Credit Risk Manager.**

B. Second Phase

(Continued)

2. Systems

- **Year-long effort to identify an appropriate risk-management system for measuring and monitoring risk relative to benchmarks.**



B. Second Phase

(Continued)

2. Systems (Continued)

- **Detailed discussions and negotiations with top vendors like Riskmetrics, BARRA, and Goldman Sachs.**

3. Reviews of Sensitive Operational Risk Issues

C. Summary

Qualitative and Process Oriented

- **Initially the role of the risk manager was largely qualitative and process oriented …**

- **… with an emphasis on gaining resource commitments.**

Quantitative

- **Later the role became much more quantitative.**

II. Boutique Commodity Futures Trading Firm (1998 to the Present)

- ***Motivation: Have risk management designed into the investment process.***

A. Risk management may be the most important element of an investment process.

B. Risk management policies are a product design issue.

C. Risk management policies determine whether a program will be viable.

II. Boutique Commodity Futures Firm
(Continued)

D. Standard risk management methodology from traditional asset managers is a useful starting point.

E. Risk management rules flow from an understanding of price behavior.

F. Useful risk management reports in futures trading.

G. Summary

A. Risk Management and the Investment Process

- **The key to a successful investment program is not in finding strategies that have a statistical edge.**

- **A prominent hedge fund manager with currently over $4 billion under management told me in 1993:**

  "Other people have the same information as I do; other people put on the same trades on as I do. I make money; they don't."

B. Risk Management Policies are a Product Design Issue

- **In derivatives trading, an investment manager has a lot of flexibility in designing an investment program.**

- **Futures trading requires a relatively small amount of margin.**

- **For example, some programs only require $7 for each $100 of exposure.**

B. Risk Management Policies are a Product Design Issue
(Continued)

- **The result is that a futures trader can easily adjust their leverage level to magnify gains (and losses.)**

- **Trade sizing is a matter of determining how much risk one wants to assume.**

- **A trader is not very constrained by the amount of initial capital committed to trading.**

B. Risk Management Policies are a Product Design Issue

(Continued)

Delevered Returns by Strategy

1997-2001 Analysis

Style	Average Levered Return (%)*	Average Delevered Return (%)*	Historical Financial Leverage*
Short Biased	13.7	9.3	0.3
Global Macro	16.8	8.9	2.0
Emerging Markets	16.9	8.8	1.0
Event Driven	14.7	8.3	1.1
Merger Arbitrage	14.7	7.0	1.8
Long/Short Equity	14.0	6.3	1.3
Fixed Income	9.6	4.8	1.5
Convertible Arbitrage	10.6	4.2	2.6
Managed Futures	10.5	4.2	2.8
Distressed Securities	n/a	n/a	1.2

CAPITAL MARKET RISK ADVISORS

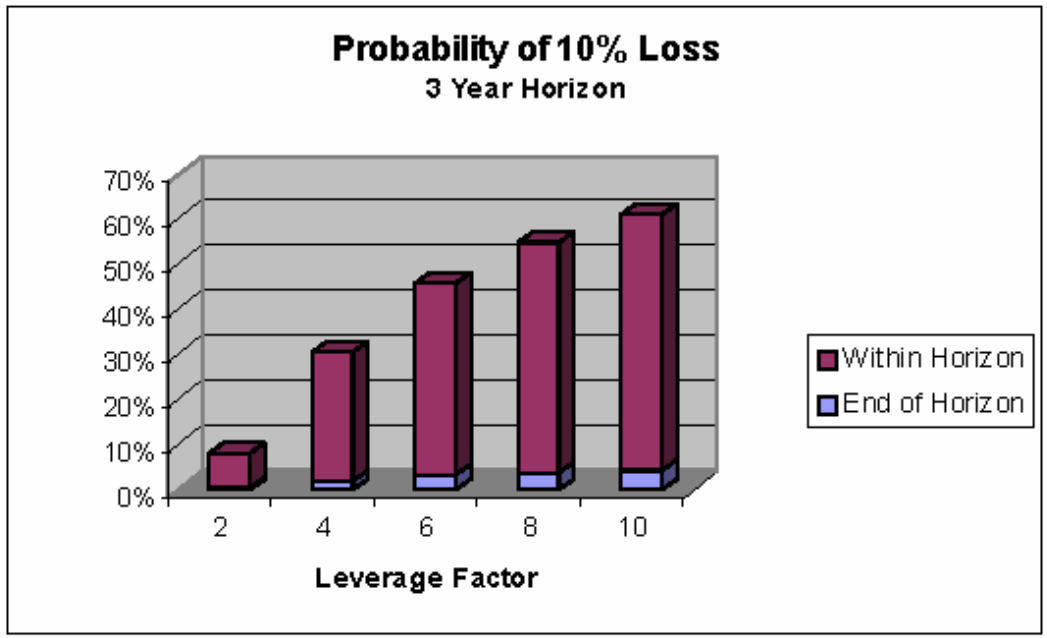
* Leverage analysis was done for funds with 5 year Historical Leverage and performance data

Source: Altvest, CSFB/Tremont, EACM, HFR, Tuna, Institutional Investor (June 2002), CMRA Analysis

B. Risk Management Policies are a Product Design Issue

(Continued)

- **With the ability to leverage, one must ensure that investors can tolerate the potential within-period losses.**



Source: Kritzman, Mark, "Hidden Risks of Hedge Funds, and Asset Allocation versus Security Selection," Presentation to QWAFAFEW, 2/12/02.

C. Risk Management Policies Determine Whether a Program will be Viable

- **Our belief is that a number of statistically significant investment opportunities exist**

  because of the possibility of very large losses.

D. Standard Risk Management Methodology is a Useful Starting Point

- **The conventional asset manager approach is a useful first step.**
- **One still needs to add several layers to this approach because of:**
  - **the unique statistical properties of commodity futures contracts, and**
  - **the different way futures products are marketed.**

E. Risk Management Rules Flow from an Understanding of Price Behavior

- **Diversified portfolios of equities have returns that appear to be symmetrically distributed.**

- **It is a different matter for commodity prices.**

E. Risk Management Rules Flow from an Understanding of Price Behavior
(Continued)

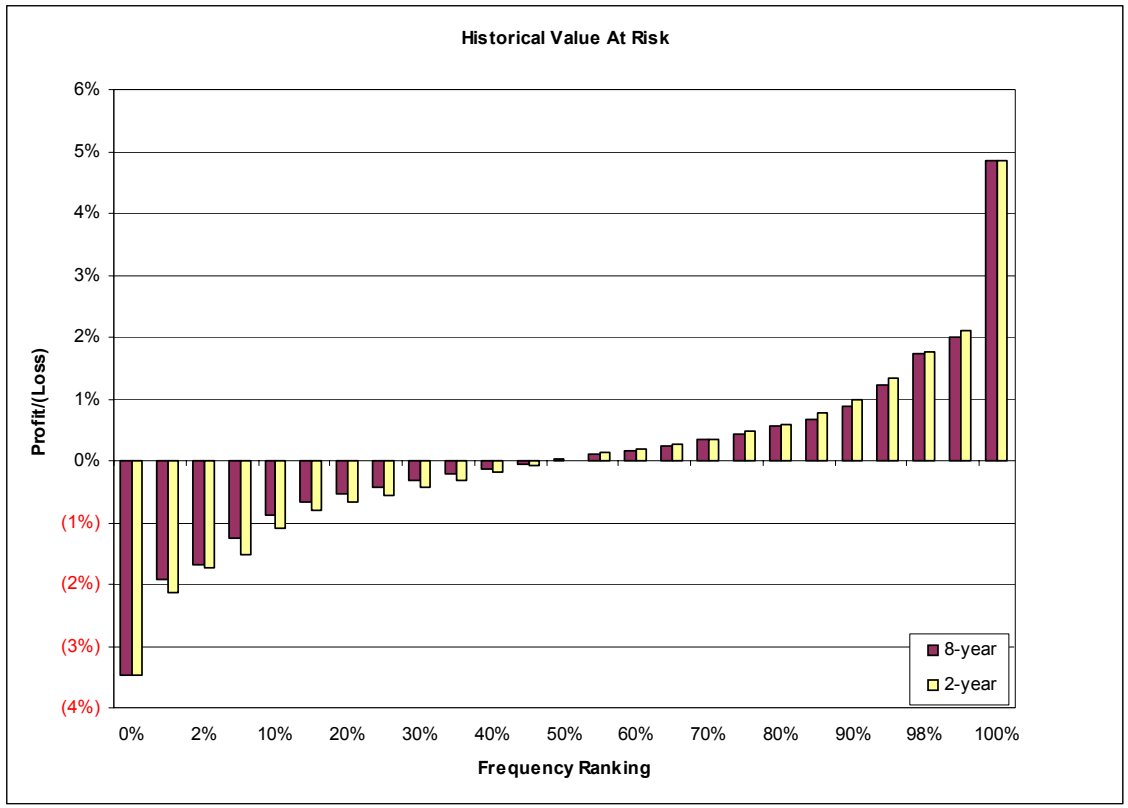
- **The empirical behavior of commodity prices can be described as follows:**
  - **Commodity prices are *extremely* volatile;**
  - **There exist rare but violent explosions in prices; and**
  - **There is substantial positive skewness in the price distributions.**

E. Risk Management Rules Flow from an Understanding of Price Behavior

(Continued)

Value-at-Risk

- The portfolio's volatility is calculated using the recent volatilities and correlations of the portfolio's instruments.



E. Risk Management Rules Flow from an Understanding of Price Behavior
(Continued)

Value-at-Risk (Continued)

- **The standard Value-at-Risk approach alone is inadequate for a commodity portfolio.**

- **A commodity portfolio consists of instruments that have a tendency toward extreme positive skewness in returns.**

- **This measure, though, is still useful when it is twinned with other measures.**

E. Risk Management Rules Flow from an Understanding of Price Behavior
(Continued)

Scenario Testing

- **Using long-term data, an investor can directly examine the worst performance of a commodity trade under similar circumstances.**

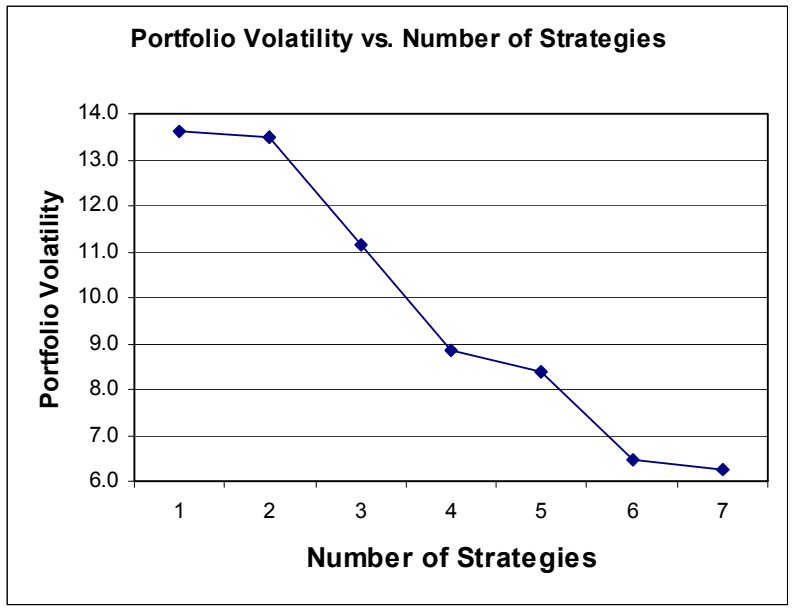
- **This measure will sometimes be larger than the Value-at-Risk measure based on recent volatility.**

E. Risk Management Rules Flow from an Understanding of Price Behavior

(Continued)

Diversification and Concentration Risk

Example of Portfolio Effect When Combining Independent Strategies

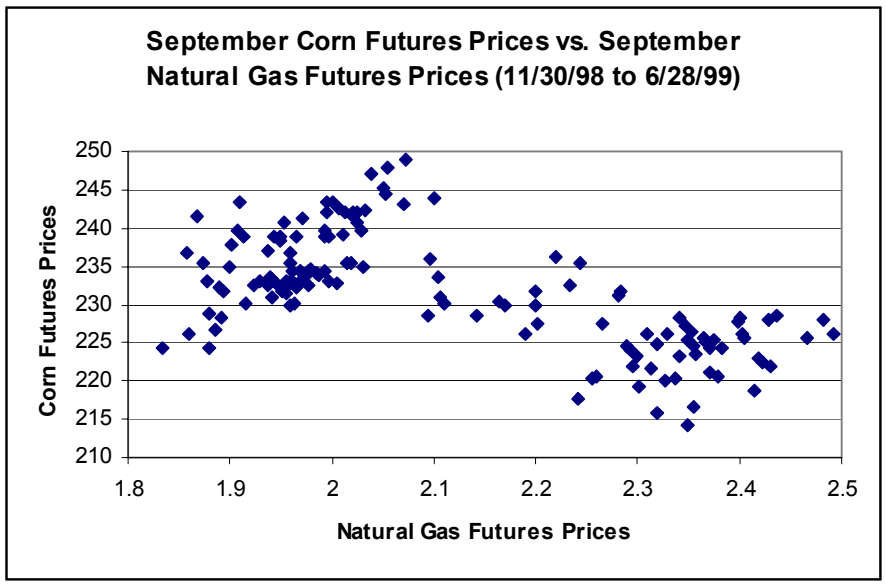


E. Risk Management Rules Flow from an Understanding of Price Behavior

(Continued)

Understanding the Fundamental Drivers of a Strategy

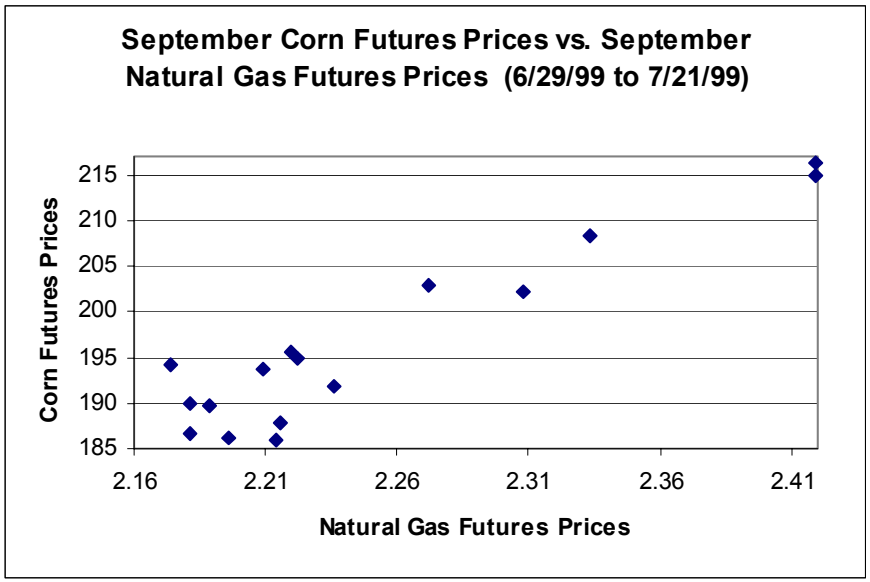
- **The following graphs illustrate how two normally unrelated markets can become temporarily very related:**



E. Risk Management Rules Flow from an Understanding of Price Behavior

(Continued)

Understanding the Fundamental Drivers of a Strategy (Continued)



E. Risk Management Rules Flow from an Understanding of Price Behavior
(Continued)

Understanding the Fundamental Drivers of a Strategy (Continued)

- **In July, both corn and natural gas prices are heavily dependent on the outcome of weather in the U.S. Midwest.**

- **And in July 1999, the Midwest experienced blistering temperatures.**

E. Risk Management Rules Flow from an Understanding of Price Behavior
(Continued)

Extraordinary Stress Testing

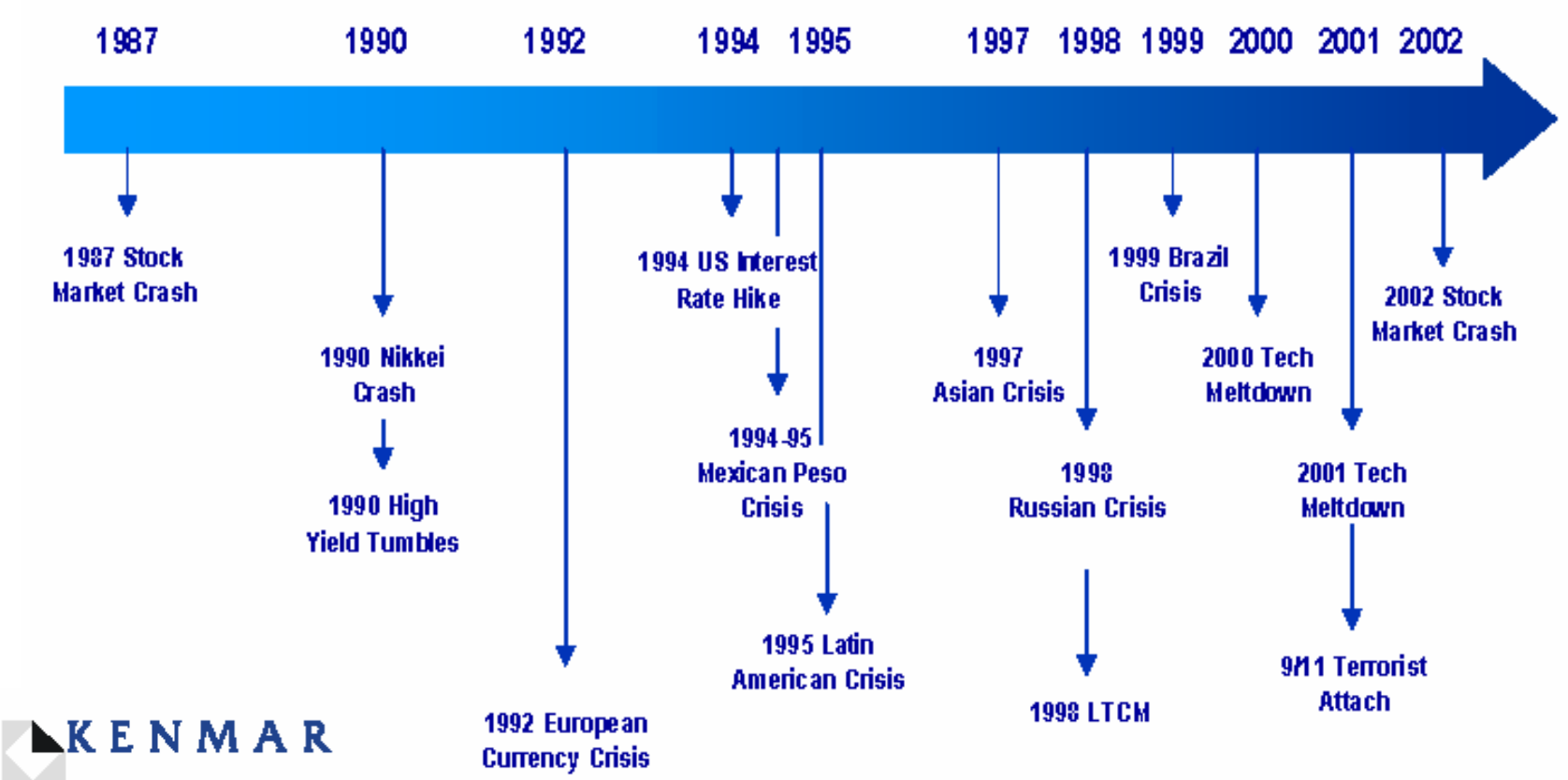
- **Futures products are marketed as equity diversifiers.**

- **Therefore, one job of risk management is to attempt to ensure that a futures investment will not be correlated to stocks during dramatic equity declines.**

- **For a futures portfolio, it is prudent to examine how the portfolio would have performed during various well-defined stock market declines.**

E. Risk Management Rules Flow from an Understanding of Price Behavior

(Continued)



F. Useful Risk Management Reports in Futures Trading

- **On a per-strategy basis, it is useful to examine each strategy's:**
  - **Value-at-Risk based on recent volatilities and correlations;**
  - **Worst-case loss during normal times;**
  - **Worst-case loss during well-defined eventful periods;**

F. Useful Risk Management Reports in Futures Trading
(Continued)

- **Incremental contribution to Portfolio Value-at-Risk; and**

- **Incremental contribution to Worst-Case Portfolio Event Risk.**

- **The latter two measures give indications on whether the strategy is a risk reducer or risk enhancer.**

F. Useful Risk Management Reports in Futures Trading
(Continued)

- **On a portfolio-wide basis, it is useful to examine:**
  - **Value-at-Risk based on recent volatilities and correlations;**
  - **Worst-case loss during normal times; and**
  - **Worst-case loss during eventful periods.**

F. Useful Risk Management Reports in Futures Trading
(Continued)

- **The next two slides give examples of a futures portfolio with the recommended measures displayed.**
- **Note the properties of the soybean crush spread.**
- **It is a portfolio event-risk reducer, but it also adds to the volatility of the portfolio.**

F. Useful Risk Management Reports in Futures Trading
(Continued)

Commodity Risk Reports

Strategy	Value-At-Risk	Worst-Case Loss During Normal Times	Worst-Case Loss During Eventful Period
Deferred Reverse Soybean Crush Spread	2.78%	-1.09%	-1.42%
Long Deferred Natural Gas Outright	0.66%	-0.18%	-0.39%
Short Deferred Wheat Spread	0.56%	-0.80%	-0.19%
Long Deferred Gasoline Outright	2.16%	-0.94%	-0.95%
Long Deferred Gasoline vs. Heating Oil Spread	2.15%	-1.04%	-2.22%
Long Deferred Hog Spread	0.90%	-1.21%	-0.65%
Portfolio	3.01%	-2.05%	-2.90%

F. Useful Risk Management Reports in Futures Trading
(Continued)

Commodity Risk Reports (Continued)

Strategy	Incremental Contribution to Portfolio Value-At-Risk*	Incremental Contribution to Worst-Case Portfolio Event Risk*
Deferred Reverse Soybean Crush Spread	0.08%	-0.24%
Long Deferred Natural Gas Outright	0.17%	0.19%
Short Deferred Wheat Spread	0.04%	0.02%
Long Deferred Gasoline Outright	0.33%	0.81%
Long Deferred Gasoline vs. Heating Oil Spread	0.93%	2.04%
Long Deferred Hog Spread	0.07%	-0.19%

* A positive contribution means that the strategy adds to risk while a negative contributions means the strategy reduces risk.

F. Useful Risk Management Reports in Futures Trading
(Continued)

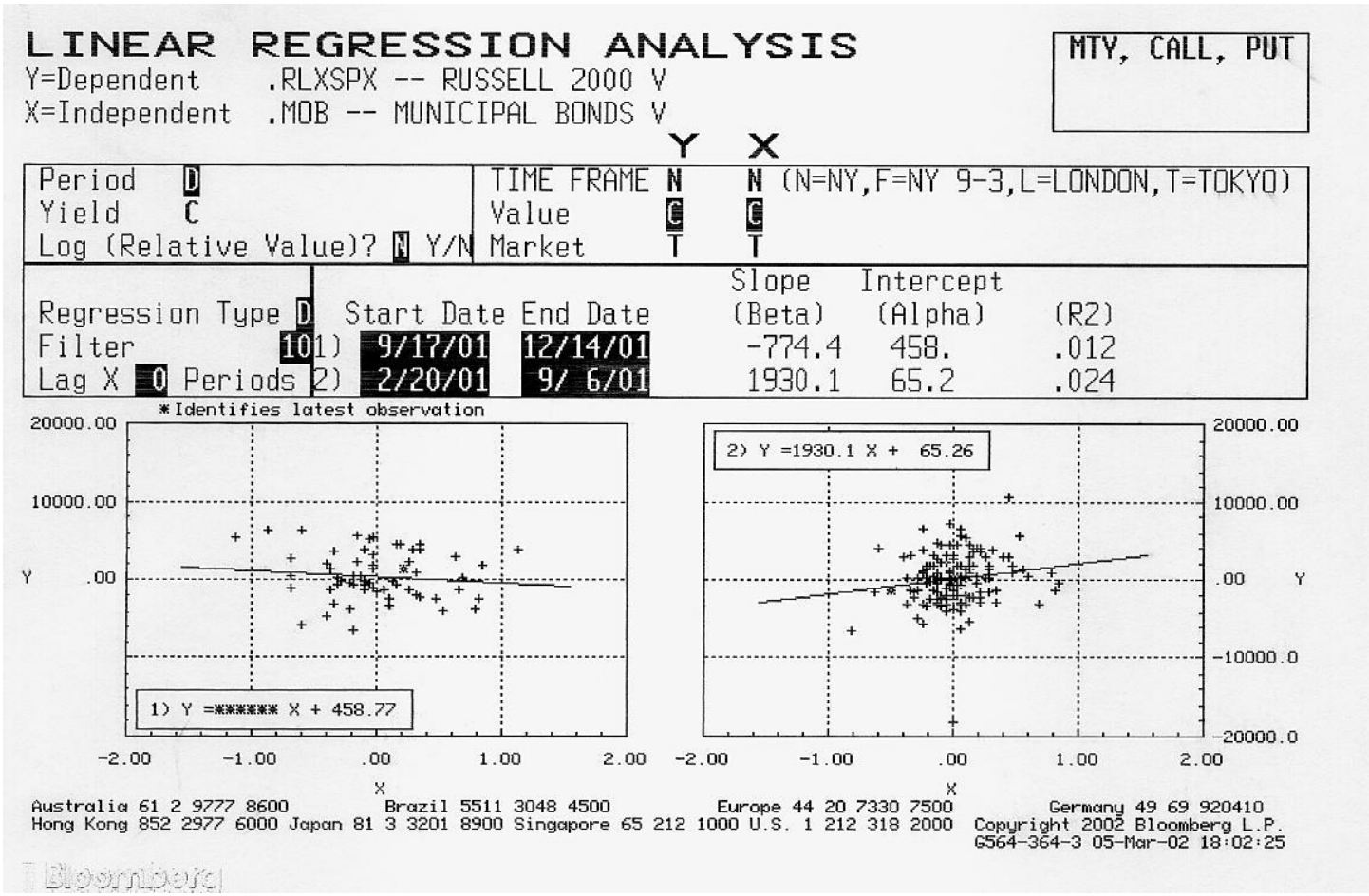
- **So an incremental contribution to risk measure based solely on recent volatilities and correlations does not give complete information about whether a trade is a diversifier or not.**

F. Useful Risk Management Reports in Futures Trading
(Continued)

- **Another example concerns financial futures trades.**
- **This example portfolio consists of a long Russell 2000 vs. a short S&P 500 futures trade and a long Municipal Bond vs. a short U.S. Bond futures trade.**
- **These trades are normally unrelated as illustrated in the graphs on the next slide ...**

F. Useful Risk Management Reports in Futures Trading

(Continued)



F. Useful Risk Management Reports in Futures Trading
(Continued)

- **But during a scenario test of the portfolio's sensitivity to event risk, we find that the combination of the two trades results in an exposure to a liquidity shock.**

F. Useful Risk Management Reports in Futures Trading
(Continued)

Event	Maximum Loss
October 1987 stock market crash	-4.11%
Gulf War in 1990	-4.12%
Fall 1998 bond market debacle	*-6.42%*
Aftermath of 9/11 attacks	-3.95%

F. Useful Risk Management Reports in Futures Trading
(Continued)

- **Worst-Case Event** — **Maximum Loss**

  Fall 1998 bond market debacle — **-6.42%**

- **Value-at-Risk based on recent volatilities and correlations**

  3.67%

F. Useful Risk Management Reports in Futures Trading
(Continued)

- **The short legs of each spread are the more liquid of the pair.**

- **So both of these trades are at risk to a flight-to-quality event as happened during the Fall of 1998.**

- **One response to a concentrated risk to a liquidity shock has been to purchase OTM fixed-income calls.**

G. Summary

Quantitative

- **Here the role of the risk manager has been largely quantitative …**

- **… with an emphasis on combining classic risk management techniques with domain-specific knowledge.**

III. Chicago-based Fixed Income Company (2003)

- ***Motivation: Create a plan for using over-the-counter derivatives in fixed-income funds.***

A. Incorporate derivatives into the investment process.

B. Adopt "Risk Standards for Institutional Managers and Institutional Investors."

C. Summary

A. Incorporate Derivatives into the Investment Process

- **"Define the investment process in terms of risk management.**
- **Establish clear investment objectives and acceptable risk tolerance level.**
- **Create a set of boundary conditions for the level of risk and the cost of risk reduction."**

Source: Collins, Bruce, and Frank Fabozzi, "Derivatives and Risk Management," *Journal of Portfolio Management*, May 1999, p. 23.

A. Incorporate Derivatives into the Investment Process
(Continued)

- **"Assess the full range of possible outcomes of using derivatives and the respective costs.**

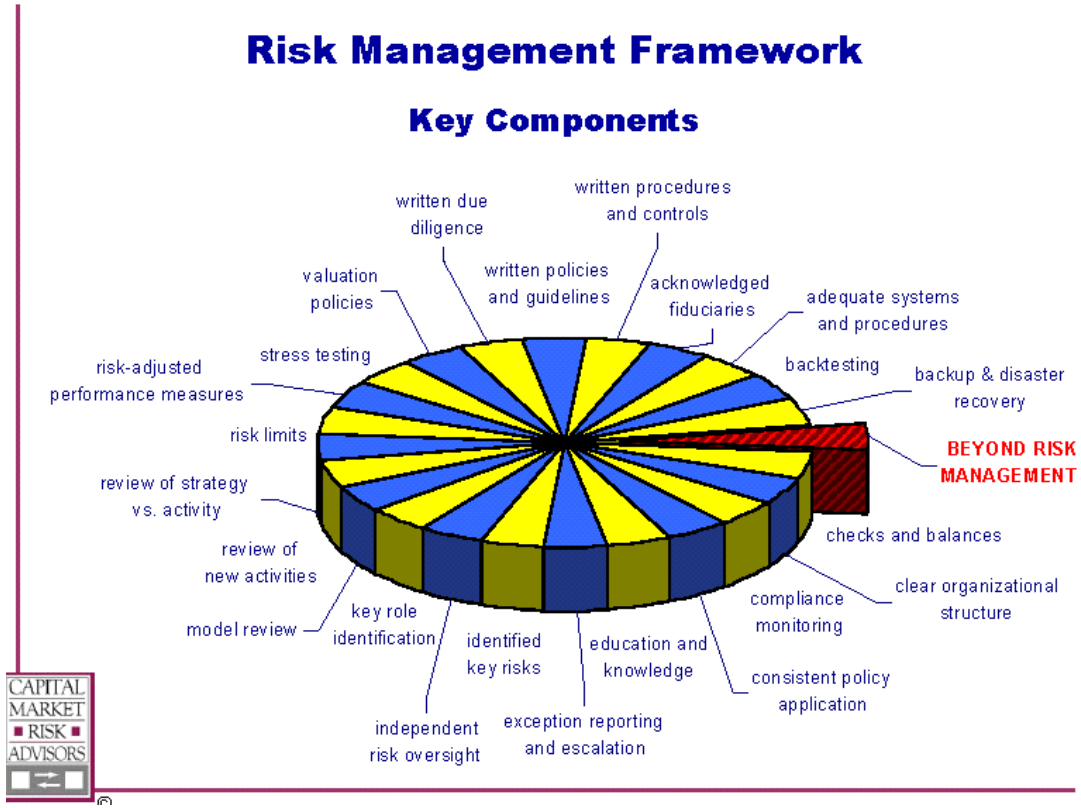
- **Assess the impact of using derivatives on the risk profile of the portfolio.**

- **Establish a monitoring protocol to measure risk.**

- **Develop an adjustment response mechanism."**

Source: Collins, Bruce, and Frank Fabozzi, "Derivatives and Risk Management," *Journal of Portfolio Management*, May 1999, p. 23.

B. Adopt "Risk Standards"



- **This pie chart summarizes the framework noted in the 1996 report, "Risk Standards for Institutional Managers and Institutional Investors."**

C. Summary

Conceptual Framework

- **The issues are largely process oriented and involve a consultant recommending the creation of two new positions: a derivatives overlay manager and an independent risk manager.**

IV. Future Challenges

- ***Motivation: The underlying framework for the investment management industry may need revamping.***

A. Current Framework: Policy Portfolios and Relative Risk

B. Post-Bubble View: Absolute Returns From Each Investment

C. Summary

A. Current Framework

1. Industry Organization

2. Investment Process

3. Risk Measurement and Monitoring

4. Consequences

1. Industry Organization

- **Pension fund consultants and financial planners advise on the long-term asset allocation mix or policy portfolio.**

Current Policy Portfolio (October 2000)

	Minimum	POLICY	Maximum	Benchmark
1. Domestic equities	12%	22%	40%	80% S&P500, 10% S&P 400, 10% Russell 2000
2. Foreign equities	10	15	20	93% EAFE, 7% Salomon Extended ex USMS
3. Emerging markets	3	9	13	IFC Global and EMBI+
4. Private equities	10	15	20	Cambridge Associates Weighted Composite
Total Equities:	40	61	75	
5. Absolute return portfolio	0	5	10	60% Sal Global Eq, 20% Morgan Global Bonds, 20% LIBOR + 5%
6. High-yield bonds	0	3	5	Salomon High-Yield and Bankrupt
7. Commodity-related[a]	3	6	9	GSCI and NCREIF Timber leverage adjusted
8. Real estate	4	7	10	NCREIF Property Index, 50% leverage
Total	12	21	32	
9. Domestic bonds	5	10	20	Lehman 5+ year Treasury Index
10. Foreign bonds	0	4	10	J.P. Morgan Non U.S.
11. Inflation-indexed bonds	2	7	12	Salomon 5+ year TIPS
12. Cash	(8)	(3)	10	One month LIBOR
Total Fixed Income:	8	18	30	
	Overall Total:	100%		

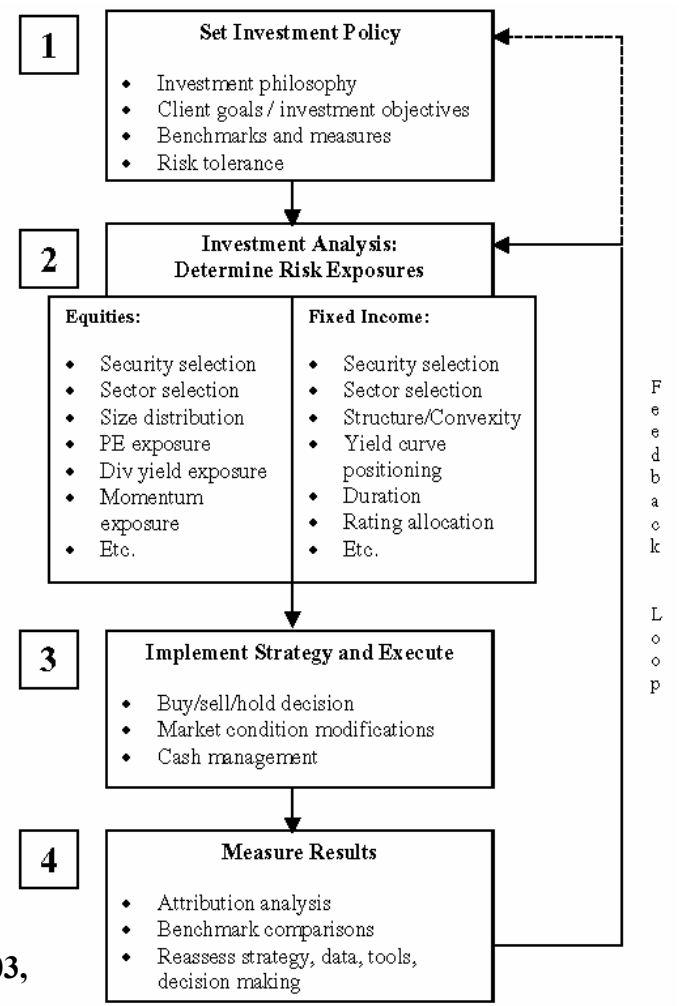
1. Industry Organization
(Continued)

- **Each asset class within the mix is assigned a benchmark.**
- **The investment managers are responsible for providing investment results that are relative to the benchmark.**
- ***The investor owns the risk of the benchmark.***

2. Investment Process

- **The investment process is centered around ensuring that any deviation from the benchmark is an active investment decision.**

- **The scaling of each active bet should correspond to the degree of confidence in that bet.**



Source: Kuenzi, David, "Strategy Benchmarks From the Investment Manager's Perspective," *Journal of Portfolio Management*, Winter 2003, Exhibit 1.

3. Risk Measurement and Monitoring

- **The risks that are monitored are all *relative* risks:**
  - **Style Drift**
  - **Tracking Error**

4. Consequences

- ***A mutual fund can lose over 50% of its market value.***

- **This is acceptable as long as the losses are consistent with its benchmark or product category.**

- **In 2001, this was the case for the aggressive growth equity style.**

4. Consequences
(Continued)

- **The manager can note that the performance is consistent with its product design.**
- **The manager can also note that they will continue offering the product.**
- **Articles on the topic are broadly sympathetic to the manager.**

B. Post-Bubble View

1. Throw Out Equity Benchmarks
2. Policy Portfolios are Obsolete
3. Downside Risk Protection Becomes Crucial
4. Consequences
5. Risk Management

1. Throw Out Equity Benchmarks

- **Equity benchmarks produce a high tracking error against underlying liabilities of pension plans.**

- **Alan Brown, group Chief Investment Officer of State Street Global Advisors**

- **Instead, pension plans may start considering:**
  - **Bigger allocations to bonds;**
  - **Increased use of risk budgeting; and**
  - **Allocations to absolute-return products.**


BENCHMARKS

TIME TO THROW OUT EQUITY BENCHMARKS

A move away from relying on equity benchmarks could herald a new era in asset management.

Source: *Global Investor*, November 2002.

2. Policy Portfolios are Obsolete

- **"The present structure has a lot of conveniences: it's a very easy way to organize the way we go about doing business.**

- **It sets up clear-cut marching orders for consultants and other people to tell us to do particular jobs.**

- **All of that suggests a degree of neatness about the investment process (but) there is nothing neat about it. It's very hard."**

Source: Peter Bernstein, quoted in, Chernoff, Joel, "Radical Thought: Bernstein Suggests Policy Portfolios No Longer Make Good Sense," *Pensions & Investments*, March 17, 2003.

3. Downside Risk Protection Becomes Crucial

- **Once one no longer has faith in equity benchmarks providing target returns, …**

- **… downside risk management becomes crucial.**

3. Downside Risk Protection is Crucial
(Continued)

- **"Investors are not indifferent whether an active manager simply captures the premium of the asset class …."**

- **" …. or whether he or she tilts the return distribution of the portfolio to the right."**

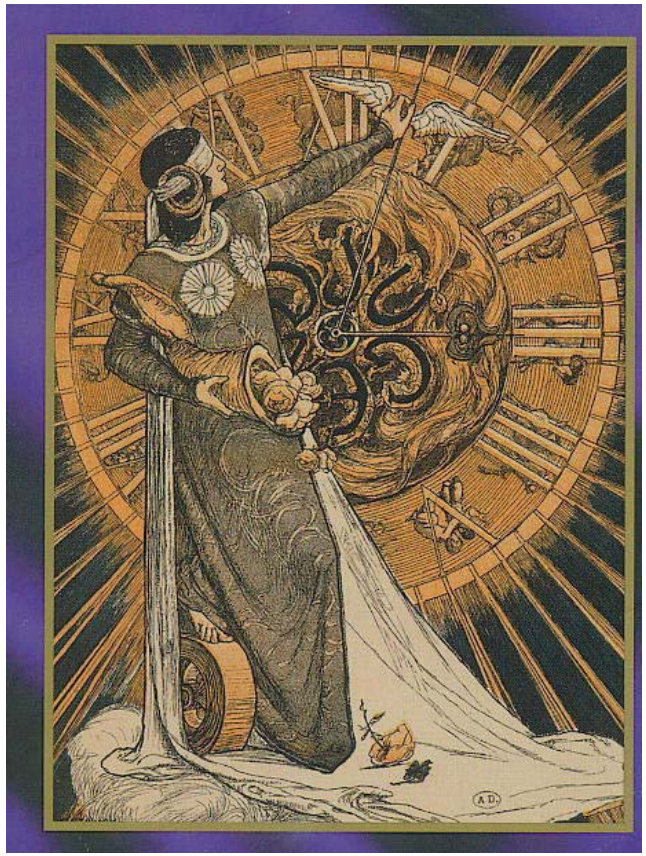
Source: Ineichen, Alexander, "Asymmetric Returns and Sector Specialists," *Journal of Alternative Investments*, Spring 2003, pp. 31-40.

4. Consequences

- **A manager is expected to keep losses under control.**
- ***It is unacceptable for a manager to lose more than 50% of market value.***

5. Risk Management

- **Event Risk**
- **Extreme Risk**



C. Summary

- **Economic historian, Peter Bernstein, calls for investors to assemble portfolios that naturally hedge investors against conceivable extreme outcomes.**

- **This may become a new framework around which investment management is organized.**

C. Summary
(Continued)

- **The role of the risk manager at investment management firms will therefore need to evolve in a world where …**

- **… policy portfolios, benchmarks, and relative risk measures may become less crucial to investment management.**

Source of Graphics

(not directly credited in presentation)

- **Slide 1, Statue of Ceres, ancient Roman goddess of the harvest, Chicago Board of Trade.**

- **Slide 13, excerpt from Barber, Joel, "Active Portfolio Management," Slide 15, Department of Finance, BA 205A, Florida International University.**

- **Slide 19, sample Refco futures statement, 11/20/01.**

- **Slide 21, excerpt from presentation by Leslie Rahl of CMRA, "Hedge Fund Transparency: Unravelling the Complex and Controversial Debate," Slide 52, RiskInvest 2002, Boston, 12/10/02.**

Source of Graphics
(Continued)

- **Slide 23, cover of Against the Gods: The Remarkable Story of Risk by Peter Bernstein, John Wiley & Sons, Inc., 1996.**

- **Slide 27, graph of historical Value-at-Risk for a commodity portfolio from "The Energy Market" presentation by Global Advisors Limited, Slide 22.**

- **Slide 30, graph of portfolio volatility vs. number of strategies from Till, Hilary, "Passive Strategies in the Commodity Futures Markets." *Derivatives Quarterly*, Fall 2000, p 54.**

- **Slides 31 and 32, graphs of Natural Gas vs. Corn prices from Till, Hilary, "Taking Full Advantage of the Statistical Properties of Commodity Investments." *The Journal of Alternative Investments*, Summer 2001, p. 65.**

Source of Graphics
(Continued)

- **Slide 35, excerpt from presentation by Richard Horwitz of Kenmar, "Constructing a 'Risk-Efficient' Portfolio of Hedge Funds," Slide 26, RiskInvest 2002, Boston, 12/11/02.**

- **Slide 36, Degas, Edgar, "The Cotton Exchange at New Orleans," 1873, Musée Municipal, Pau, France.**

- **Slides 40 and 41, commodity portfolio risk measures from Till, Hilary, "Risk Management Lessons in Leveraged Futures Trading," *Commodities Now*, September 2002, pp. 84-87.**

Source of Graphics
(Continued)

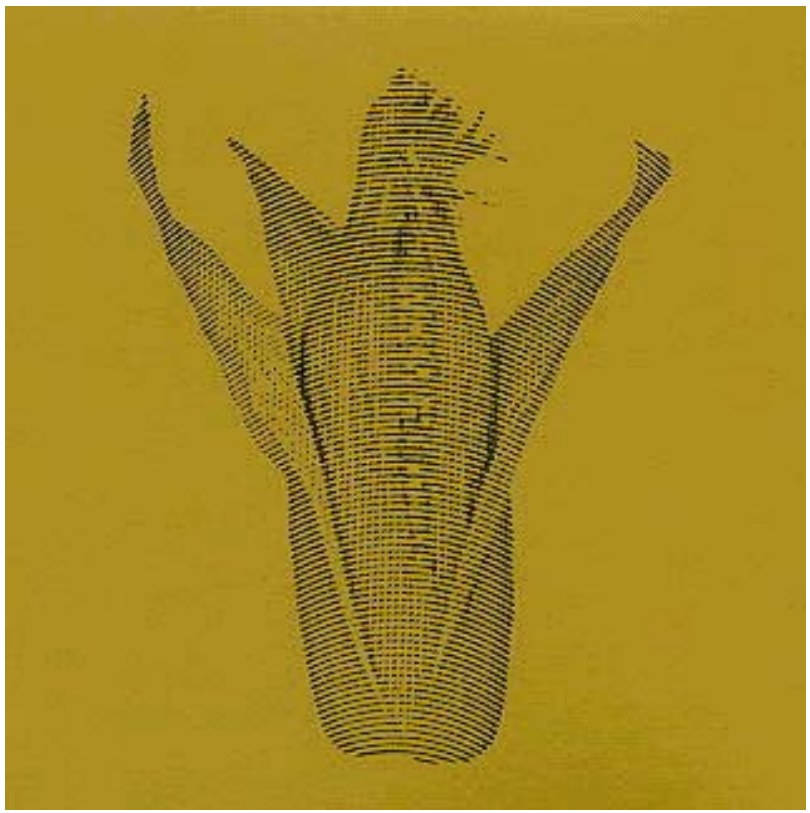
- **Slide 44, graphs of RLX-SPX vs. MOB futures spreads, The Bloomberg.**

- **Slide 53, excerpt from presentation by Leslie Rahl of CMRA, "Hedge Fund Transparency: Unravelling the Complex and Controversial Debate," Slide 7, RiskInvest 2002, Boston, 12/10/02.**

- **Slide 57, "Harvard Management Company (2001)," Harvard Business School Case Study, 9-201-129, 10/23/2001, Exhibit 4.**

- **Slide 69, cover of Fooled By Randomness: The Hidden Role of Chance in the Markets and Life by Nassim Nicholas Taleb, Texere LLC, 2001.**

CONTACT US



Ms. Hilary Till

Premia Risk Consultancy, Inc.

Phone: 312-583-1137

Fax: 312-873-3914

E-mail: info@premiacap.com