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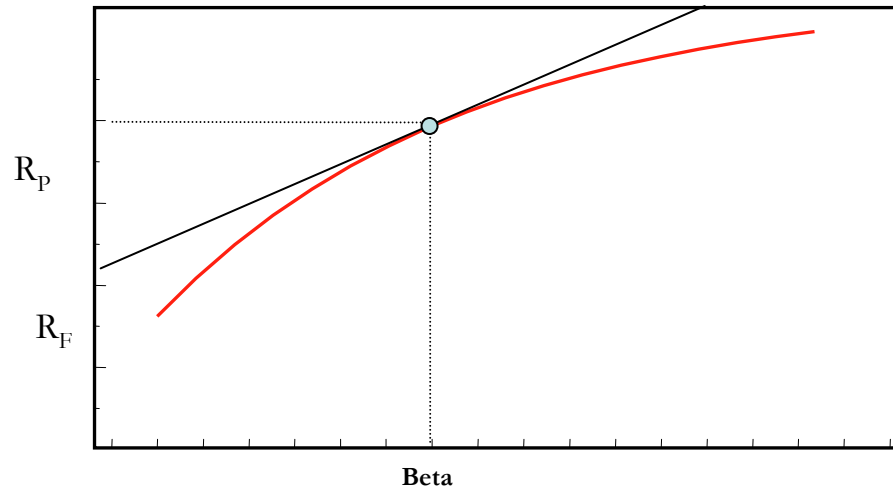
# The Search for Alpha in Efficient Markets

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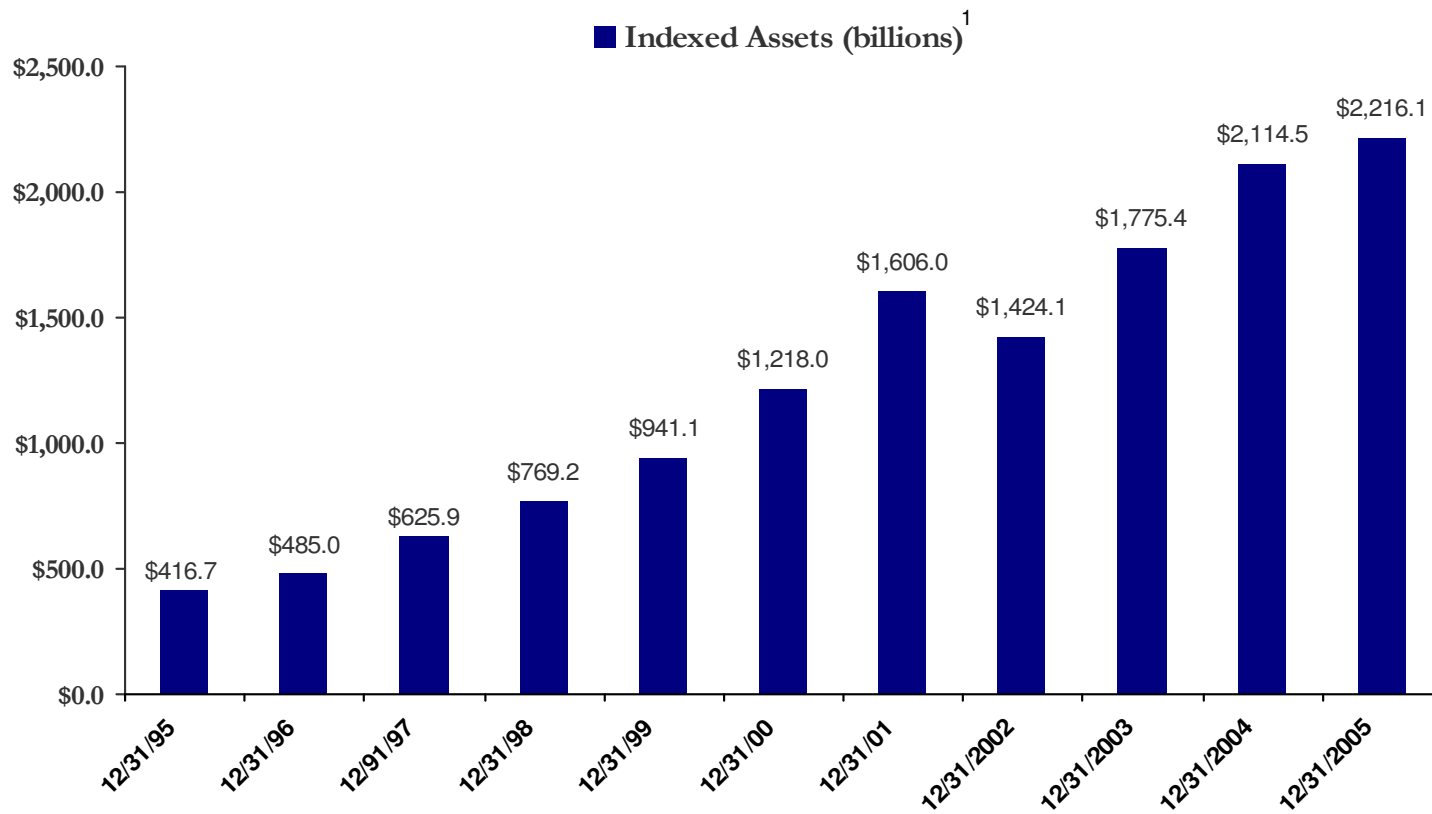
November 2006

# The Evolution of Modern Portfolio Theory



- |   |                                    |   |
|---|------------------------------------|---|
| ▪ Harry <b>Markowitz</b> , 1952                               | <u>Portfolio Selection</u>         | ▪ Consideration of covariance can reduce risk (Markowitz)   |
| ▪ James <b>Tobin</b> , 1958                                   | <u>Separation Theorem</u>          | ▪ There are optimal combinations of risky securities that, when combined with lending and borrowing, will dominate all other portfolios (Tobin) |
| ▪ William <b>Sharpe</b> , 1964                                | <u>CAPM</u>                        | ▪ An investor cannot generate a return higher than the market portfolio without taking on additional risk (Sharpe)                              |
| ▪ Eugene <b>Fama</b> , (60's – 70's)<br>Kenneth <b>French</b> | <u>Efficient Market Hypothesis</u> | ▪ Efficient markets exist and the S&P 500 is an efficient portfolio (Fama/French)   |

# The Indexing Boom



<sup>1</sup> Source: Pensions & Investments, March 20, 2006, data as of 12/31/05

# Problems with CAPM

- CAPM assumptions were significantly divergent from observed reality. They were normative in nature as opposed to descriptive.
- The S&P 500 is a capitalization weighted index where no consideration is given to covariance.
- Markowitz issues
  - Time horizon
  - Expected stock behavior
  - Borrowing & lending
  - No short sale penalties

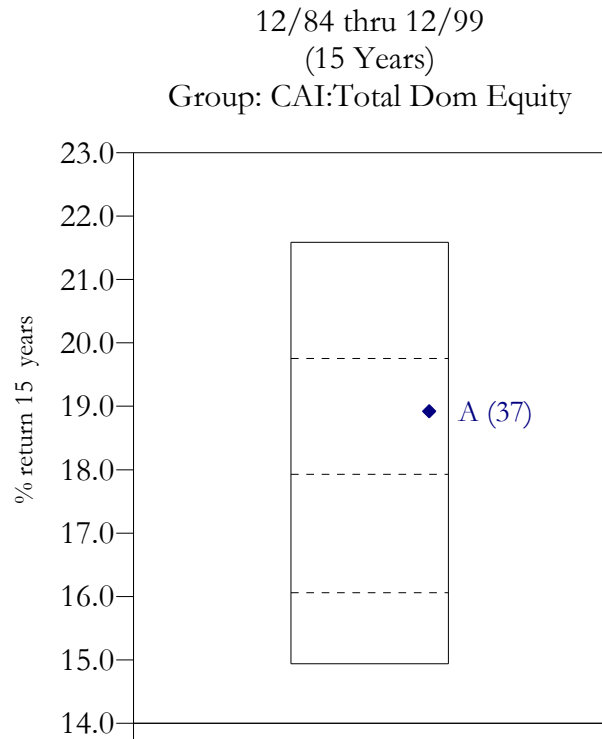
If these assumptions don't hold, CAPM fails (Markowitz)

# A Critical Distinction

- In June of 1991 and again in 2005, Harry Markowitz made a distinction between an efficient portfolio and an efficient market.
- The floor of the NYSE may be “efficient” in an equilibrium sense, but the “market portfolio” is constructed by matching the portfolio weights with the capitalization weights of the stocks in the index. No consideration is given to covariance, the critical element in Markowitz’s theory. This is very unlikely to be mean/variance efficient, i.e., to have the highest return for a given level of risk.

**Therefore, there is no theoretical impediment to creating a portfolio with market risk, but above market expected return.**

# Who Cared?



S&P:500 ♦ A 18.92

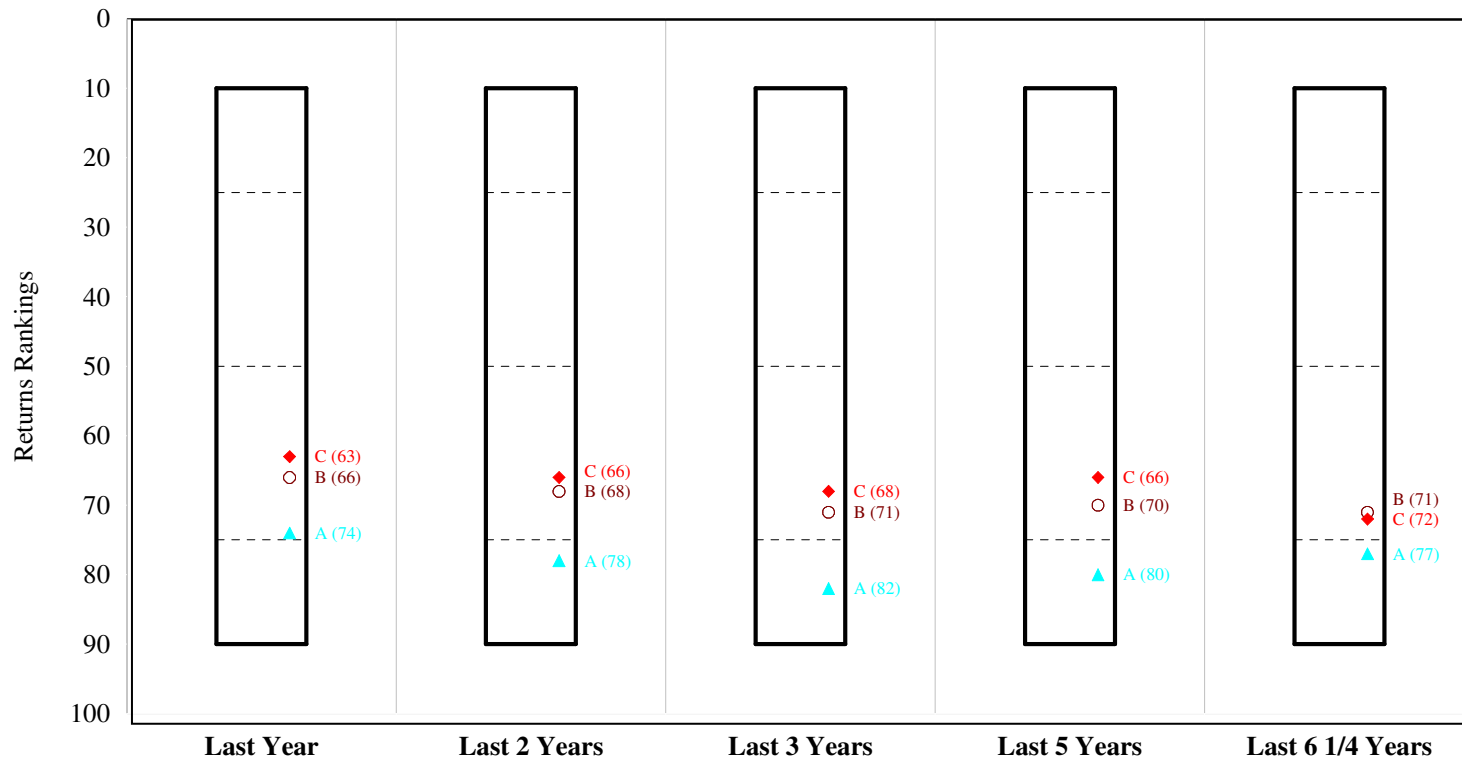
S&P:500 Rank 37

- The S&P 500 Index outperformed 63% of active managers in the 15 years from 12/84 thru 12/99.
- In the 1980s and 1990s the S&P 500 Index averaged over 17% per year. Who needed active management?
- Cost of active management vs passive management.
- Career risk.

Source: Callan Associates, Inc., 526 funds in total US Equity database.

# But Indexers Have Underperformed So Far This Decade

Returns for  
Various Periods Ended  
June 30, 2006  
Group: CAI:Total Dom Equity



|                         |     |      |      |       |      |        |
|-------------------------|-----|------|------|-------|------|--------|
| S&P 500                 | ▲ A | 8.63 | 7.47 | 11.22 | 2.49 | (1.02) |
| Russell 3000 Index      | ○ B | 9.56 | 8.80 | 12.56 | 3.53 | (0.19) |
| DJ Wilshire 5000        | ◆ C | 9.92 | 9.07 | 12.98 | 4.02 | (0.23) |
| S&P 500 Rank            |     | 74   | 78   | 82    | 80   | 77     |
| Russell 3000 Index Rank |     | 66   | 68   | 71    | 70   | 71     |
| DJ Wilshire 5000 Rank   |     | 63   | 66   | 68    | 66   | 72     |

(1=Highest,100=Lowest)

Source: Callan Associates, Inc.  
There are 2839 funds in the total Domestic Equity database  
Data presented reflects past performance, which is no guarantee of future results.

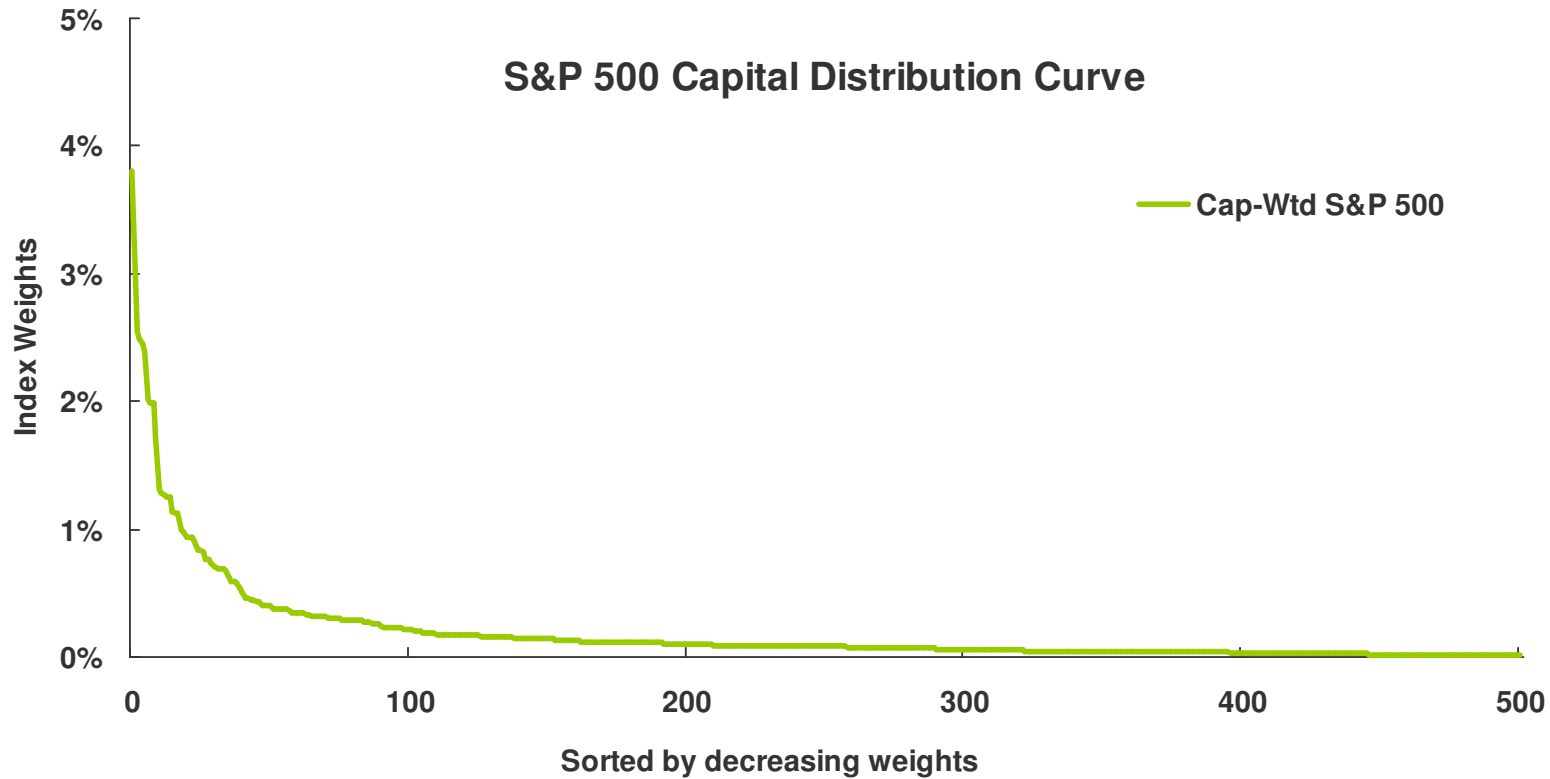
# So, It May Not Be so Simple as Merely Indexing

- Most research advocating passive is likely:
  1. Time Biased
  2. Diversity Biased

# Manager Performance and the Diversity Cycle

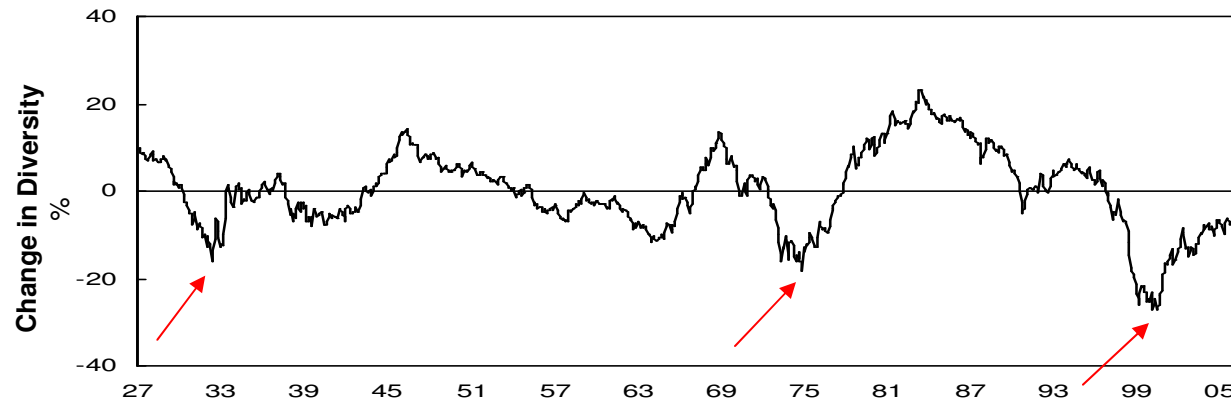
- **Diversity is a measure of the degree to which capital is spread among the securities in an equity market or index. Changes in diversity measure the size effect, or returns of large vs. small stocks.**
- **The relative performance of equity managers is highly correlated with changes in market diversity.**

# Sample Capital Distribution Curve – S&P 500 Index



Data as of December 31, 2001  
Source: INTECH and Standard & Poor's Corp.  
See Presentation Notes

# Change in Market Diversity: 1927 – December, 2004



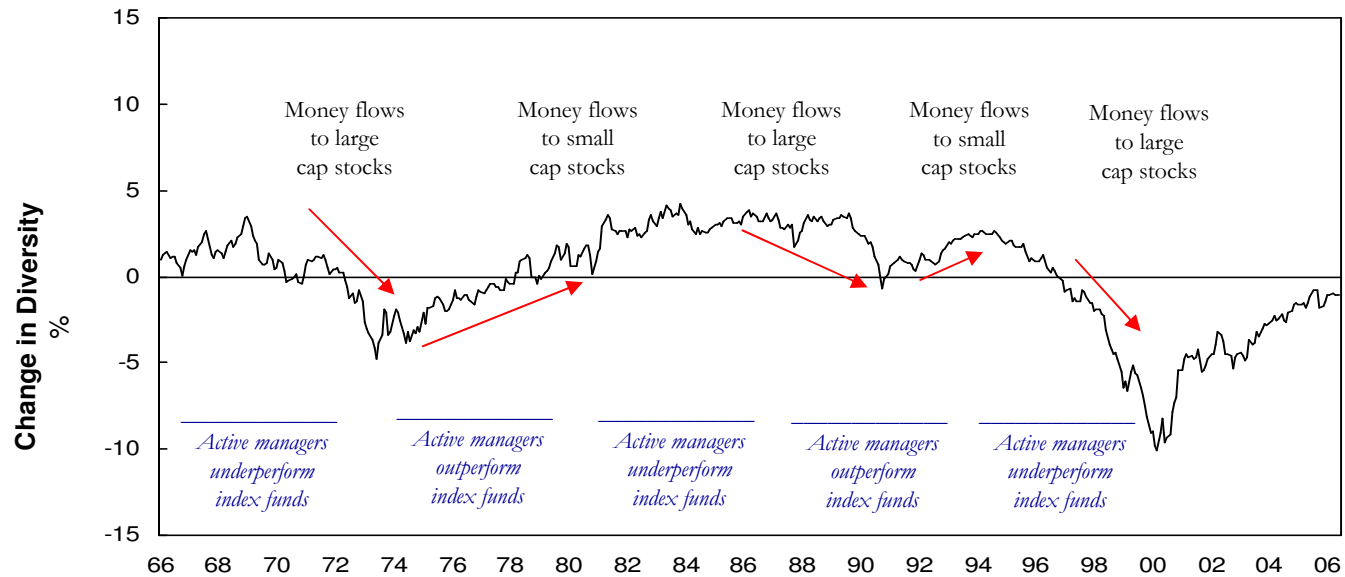
**Market diversity has been mean-reverting over the long-term.**

**Low points in diversity indicate concentration of capital into the largest stocks. Low points occurred in:**

- **1932: The Great Depression,**
- **1974: The “Nifty-Fifty” period,**
- **2000: The “Mega Cap” era**

# Variation in Diversity - S&P 500 Stocks

## Variation in Diversity S&P 500 Stocks



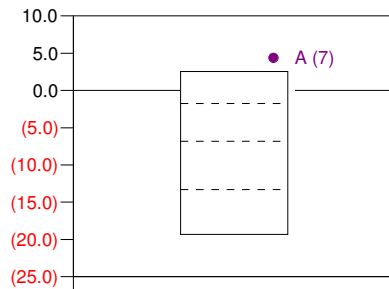
**Active managers have tended to outperform when diversity is rising and underperform when it is declining**

Charts are cumulative through June 30, 2006  
Modified CRSP Database – Center for Research in Security Prices University of Chicago  
Source – CRSP  
See Presentation Notes

# Periods of Declining Diversity

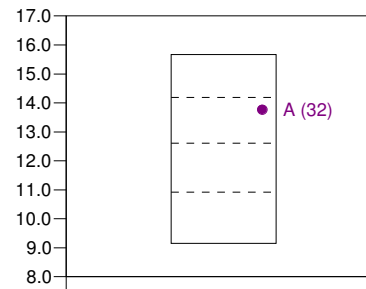
## Annualized return and quartile ranking

12/71 thru 6/73  
(1 1/2 Years)



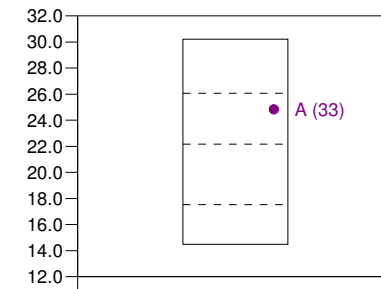
|                 |         |
|-----------------|---------|
| 25th Percentile | (1.74)  |
| Median          | (6.84)  |
| 75th Percentile | (13.32) |
| Member Count    | 187     |
| S&P 500 ● A     | 4.34    |
| S&P 500 Rank    | 7       |

12/83 thru 9/90  
(6 3/4 Years)



|                 |       |
|-----------------|-------|
| 25th Percentile | 14.19 |
| Median          | 12.61 |
| 75th Percentile | 10.92 |
| Member Count    | 742   |
| S&P 500 ● A     | 13.76 |
| S&P 500 Rank    | 32    |

3/94 thru 3/00  
(6 Years)

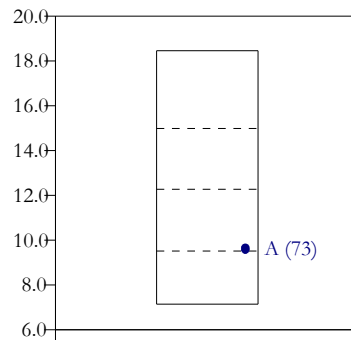


|                 |       |
|-----------------|-------|
| 25th Percentile | 26.08 |
| Median          | 22.16 |
| 75th Percentile | 17.52 |
| Member Count    | 1,184 |
| S&P 500 ● A     | 24.82 |
| S&P 500 Rank    | 33    |

Source: Callan Associates, Inc. – Total US Equity Database  
See Presentation Notes

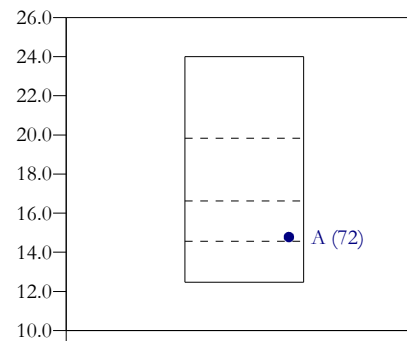
# Periods of Rising Diversity

6/73 thru 12/83  
(10 1/2 Years)



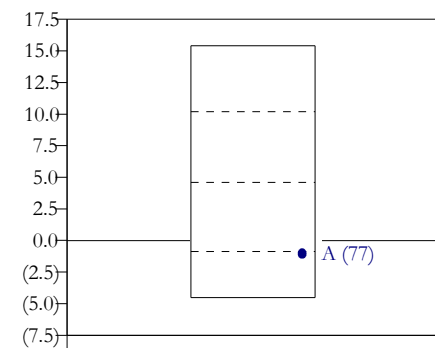
|                 |       |
|-----------------|-------|
| 25th Percentile | 14.99 |
| Median          | 12.27 |
| 75th Percentile | 9.51  |
| Member Count    | 214   |
| S&P:500 ● A     | 9.62  |
| S&P:500 Rank    | 73    |

9/90 thru 3/94  
(3 1/2 Years)



|                 |       |
|-----------------|-------|
| 25th Percentile | 19.82 |
| Median          | 16.62 |
| 75th Percentile | 14.57 |
| Member Count    | 839   |
| S&P:500 ● A     | 14.78 |
| S&P:500 Rank    | 72    |

3/00 thru 6/06  
(6 Years)



|                 |        |
|-----------------|--------|
| 25th Percentile | 10.20  |
| Median          | 4.61   |
| 75th Percentile | (0.86) |
| Member Count    | 1,584  |
| S&P:500 ● A     | (1.02) |
| S&P:500 Rank    | 77     |

Source: Callan Associates, Inc. – Total US Equity Database  
See Presentation Notes for additional information.

# Manager Performance and Change in Diversity

- Change in diversity explains more than half of the annual variation in relative manager performance. The correlation is 72%\*
- Most managers appear to spread their investments more evenly among the stocks in their portfolios.
- Over periods of increasing diversity, first quartile managers outperformed the S&P 500 Index by substantial amounts.
- Annual Excess\*\*:

|                | <u>Median</u>  | <u>1st Quartile</u> |
|----------------|----------------|---------------------|
| 1973 thru 1983 | +190 basis pts | +484 basis pts      |
| 1990 thru 1993 | +187 basis pts | +503 basis pts      |
| 3/00 thru 6/06 | +563 basis pts | +1122 basis pts     |

\* Source: "Manager Performance and the Diversity Cycle", Fernholz and Garvy, May 1999.

\*\* Callan Associates, Inc.

# The Decade of Risk Management and The Return of Alpha

|               | <u>2000</u> | <u>2001</u> | <u>2002</u> | <u>2003</u> | <u>2004</u> | <u>2005</u> | <u>2006 - 2009</u> |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------|
| S&P 500 Index | -9.10%      | -11.88%     | -22.09%     | 28.68%      | 10.88%      | 4.91%       | ?                  |

- 2000 to 2005 average (-1.13%).
- Low nominal returns forecast by many experienced observers for the decade.
- If the S&P 500 returns 14.92% per year over the remaining 4 years of the decade (from 12/31/05), the return for the decade will be 5% annually.

# The Problem

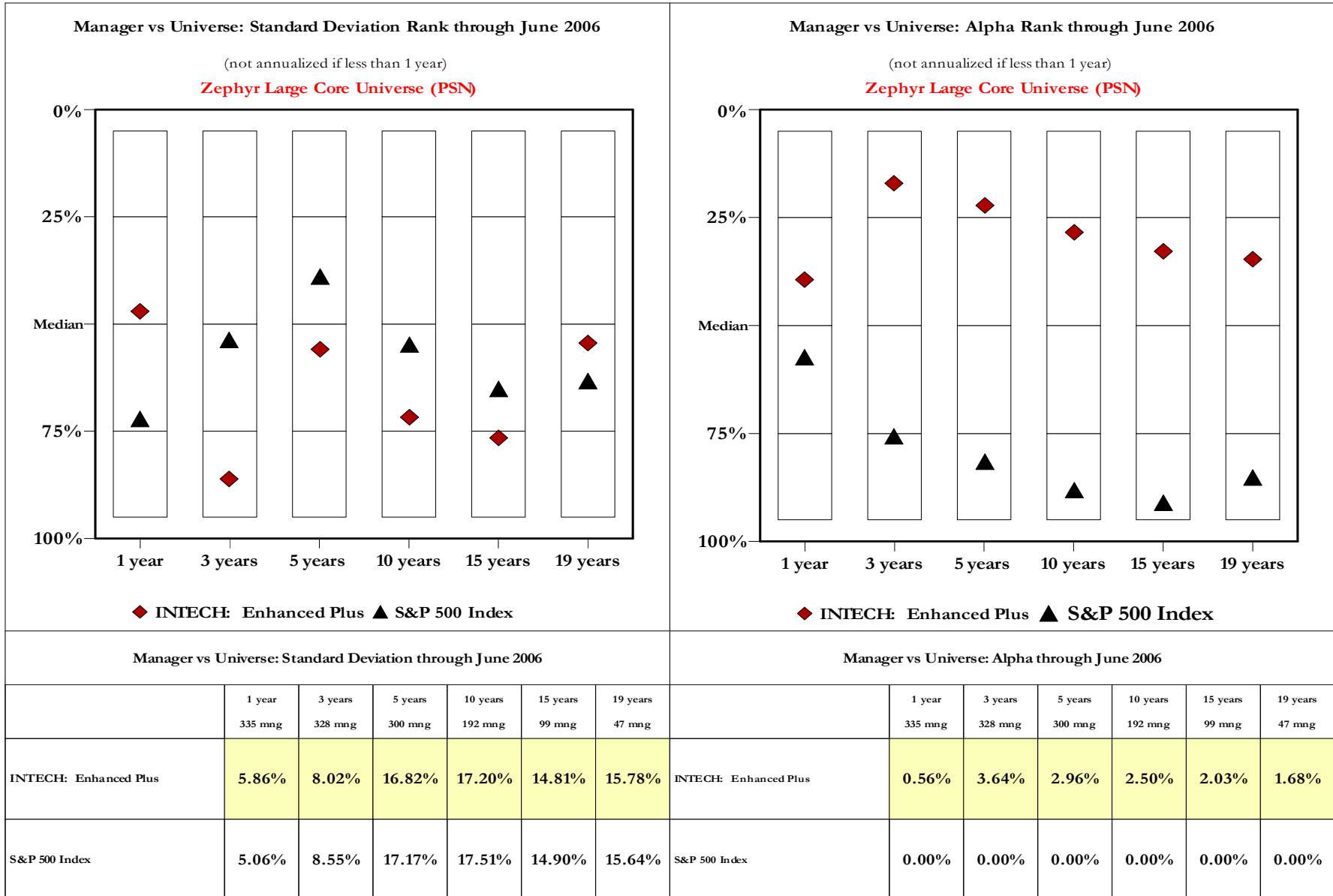
- First 6 years of 2000 – 2009 have negative returns for the S&P 500 of -1.13% (annualized).
- Many pension funds are facing significant under funding due to poor returns.
- Many individuals are fearful about investing as they have experienced a major markdown of 401(k) assets and personal portfolios.
- Low nominal returns are expected by many consultants through at least 2009.
- Risk management is now a primary consideration.
- Expansion into alternative investments and hedge funds generally have capacity and fiduciary constraints.

**Plan Sponsors need Alpha!**

# Risk Managed Products May be a Solution

- Risk managed products are also known as “Enhanced Index”
- Risk managed products are typically characterized by:
  - quantitative investment processes
  - tight risk controls
  - lower tracking error than other portfolios with similar excess return goals
  - high information ratios

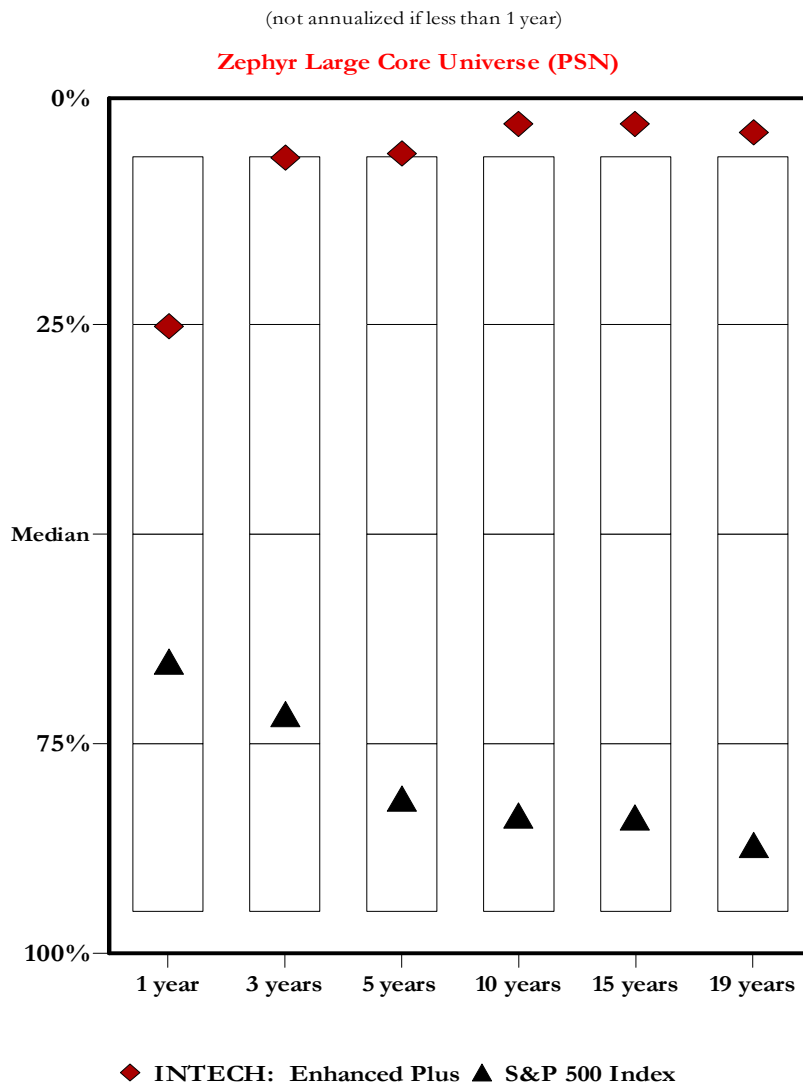
# Enhanced Plus



Data presented reflects past performance, which is no guarantee of future results. Results presented gross of fees.

# Enhanced Plus

Manager vs Universe: Information Ratio Rank through June 2006



Manager vs Universe: Information Ratio through June 2006

|                              | 1 year<br>335 mng | 3 years<br>328 mng | 5 years<br>300 mng | 10 years<br>192 mng | 15 years<br>99 mng | 19 years<br>47 mng |
|------------------------------|-------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| 5th Percentile               | 3.85              | 2.23               | 1.60               | 0.92                | 0.74               | 0.70               |
| 25th Percentile              | 1.40              | 1.30               | 1.00               | 0.57                | 0.52               | 0.40               |
| Median                       | 0.58              | 0.72               | 0.55               | 0.35                | 0.29               | 0.19               |
| 75th Percentile              | -0.58             | -0.13              | 0.10               | 0.14                | 0.11               | 0.06               |
| 95th Percentile              | -2.45             | -1.29              | -0.57              | -0.21               | -0.30              | -0.17              |
| <b>INTECH: Enhanced Plus</b> | <b>1.39</b>       | <b>2.22</b>        | <b>1.62</b>        | <b>1.24</b>         | <b>1.00</b>        | <b>0.85</b>        |
| S&P 500 Index                | 0.00              | 0.00               | 0.00               | 0.00                | 0.00               | 0.00               |

Manager vs Universe: Information Ratio Rank through June 2006

|                              | 1 year<br>335 mng | 3 years<br>328 mng | 5 years<br>300 mng | 10 years<br>192 mng | 15 years<br>99 mng | 19 years<br>47 mng |
|------------------------------|-------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| <b>INTECH: Enhanced Plus</b> | <b>25.15%</b>     | <b>5.20%</b>       | <b>4.68%</b>       | <b>1.05%</b>        | <b>1.02%</b>       | <b>2.17%</b>       |
| S&P 500 Index                | 65.18%            | 71.58%             | 81.47%             | 83.42%              | 83.84%             | 87.01%             |

Data presented reflects past performance, which is no guarantee of future results. Results presented gross of fees.

# Don't Be Fooled By Randomness

*“Scientists are seeing more and more evidence that we are specifically designed by Mother Nature to fool ourselves.” Nassim Taleb in “Fooled by Randomness”.*

- **High information ratios are a good measure of portfolio efficiency in broad based strategies.**

|                             | Time Period                 | Information Ratio | t Statistic | % One Tail Significance |
|-----------------------------|-----------------------------|-------------------|-------------|-------------------------|
| Mathematical Enhanced Index | 15 years<br>(ended 3/31/06) | 0.96              | 3.59        | 0.02                    |

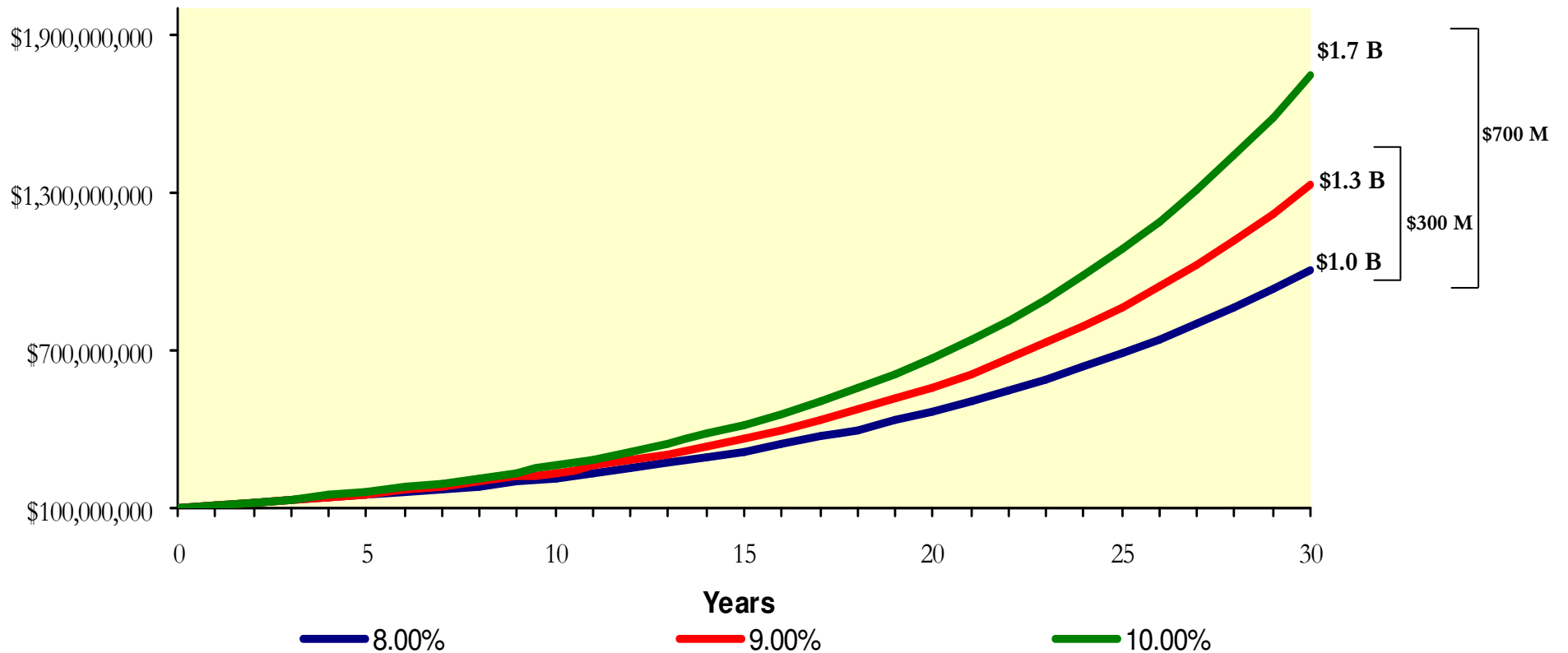
- **Measure of consistency of excess returns.**
- **Statistically, information ratio of 1.0 implies outperformance 5 out of every 6 years.**
- **Seek high information ratios and high t-statistics.**

**Avoiding the “Black Swan” is the key to longevity**

\* Mathematical Enhanced Index information for 15 year period ended 3-31-06

# The 1% Difference

Hypothetical Growth of \$100 Million  
For 30 Years at 8.00%, 9.00% and 10.00%



Rates of return are hypothetical and do not represent the returns of any particular investment.

# Summary

- In our opinion, funding demands and low nominal returns will continue to fuel the move from pure index funds to risk managed products.
- We believe the need for risk management will support this trend.
- Consistent excess returns with controlled risk can significantly reduce the need for external funding.
- High information ratios result in more consistent relative performance and less chance of negative relative performance.

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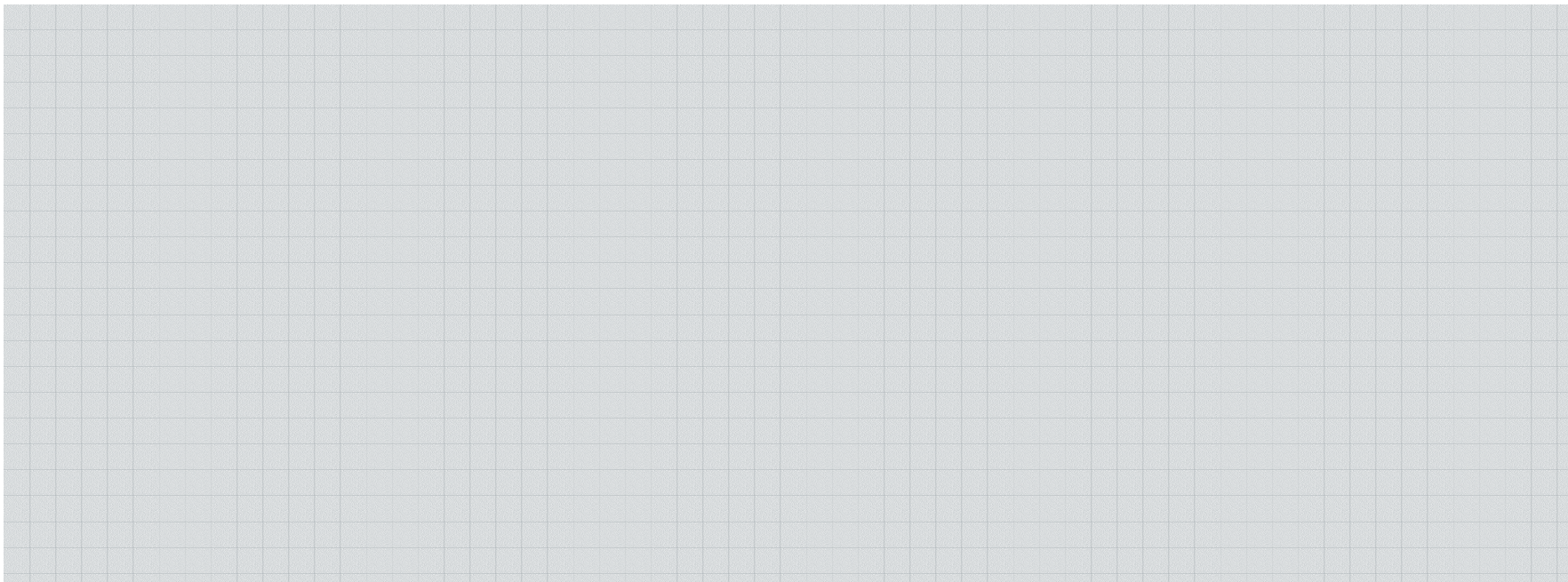
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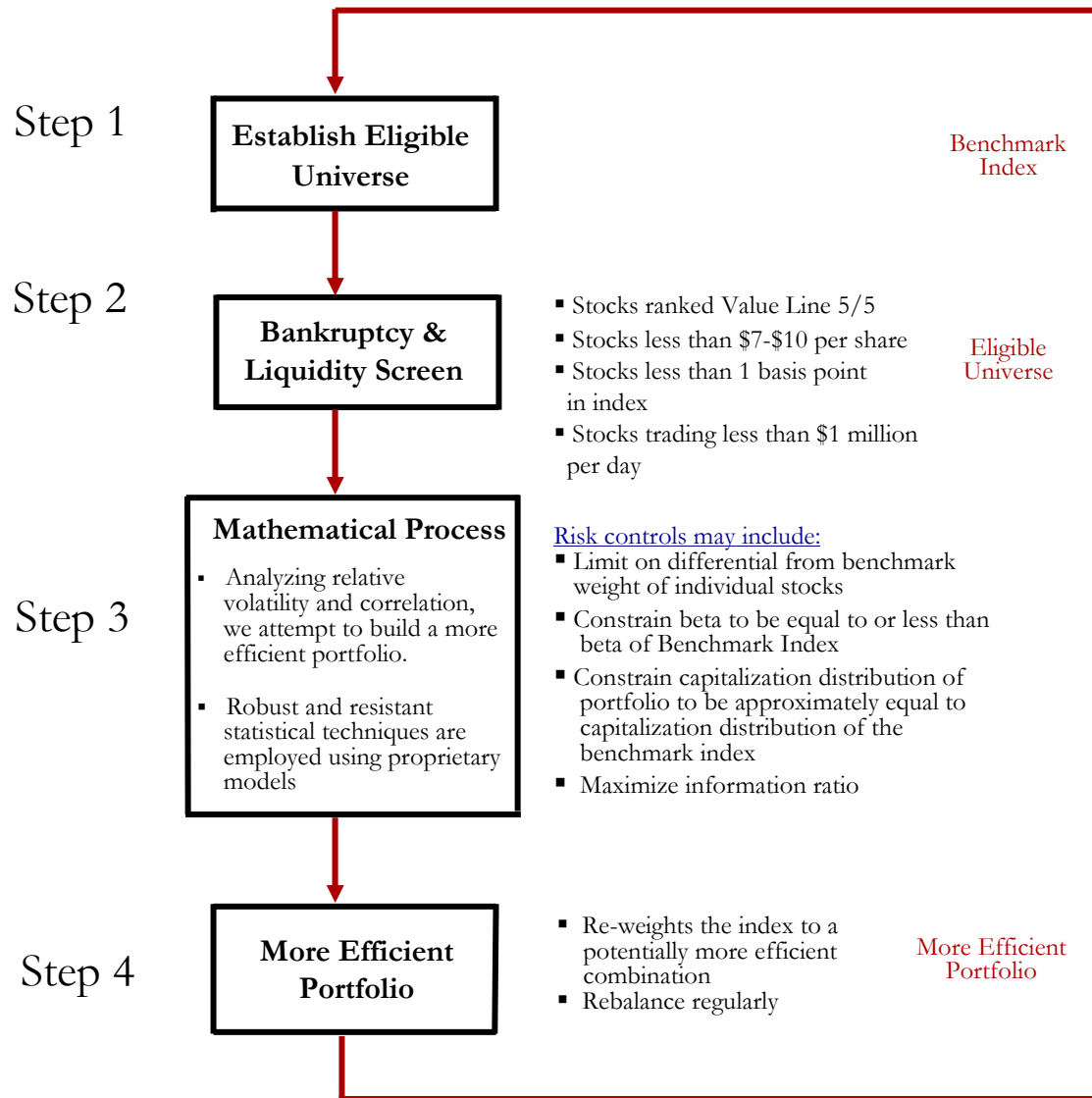


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# Appendix



# Investment Process



## How stocks are chosen or eliminated from the portfolio

- Some stocks are eliminated due to bankruptcy and liquidity screens.
- If volatility and correlation characteristics of security combinations add potential for excess return and/or reduction of relative risk it may result in overweighting those stocks.
- Do risk controls that govern portfolio construction mandate inclusion?
- High stock volatility risk may require broader diversification.