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The financial press has been very good to "indexing" this year. Articles like Jane Bryant Quinn's Indexing: For Winners Only in the April 17, 1995 Newsweek point out the features of the most common S&P 500 funds.

This new interest by the mainstream press has been prompted by the underperformance of active managers this year. But, to their credit, magazines like Money (August 1995 issue) have been stimulated to look deeper into the long-term benefits of indexing and admit that they have been wrong to ignore and even criticize the strategy in years past.

We have not seen too many articles dig deeper and extend indexing to "asset class investing" as we would like. As our clients know, indexing should involve much more than buying an S&P 500 fund. Ignoring the value, small company, and international assets classes or using funds that fail to fully capture their potential can result in significant opportunity costs.

We won't complain about the progress so far—we just look forward to even better articles in the future.

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Don't Be Fooled By Technology

By Jeff Troutner

This year's stock market has been fueled by a euphoria surrounding anything technology related. Besides O.J, it seems all we've heard about this year are computers, Bill Gates, and the Internet. Even TAM has gotten caught up in the excitement—by the end of this month we will have our own site on the World Wide Web.

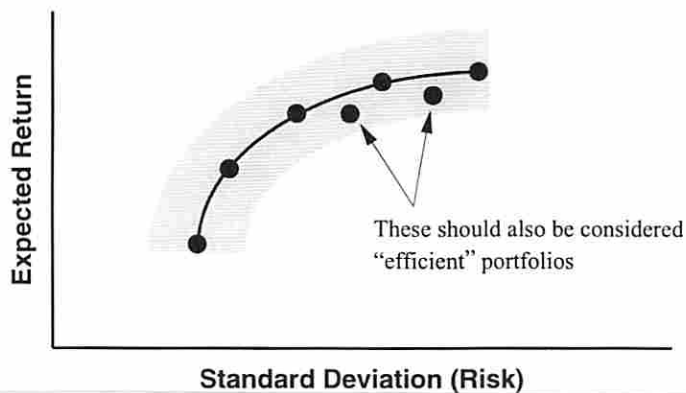
Computers have certainly contributed to market efficiency and made it easier for index fund managers to track and passively manage over 10,000 U.S. and international securities. But technology is sometimes overemphasized in the investment industry on both the passive and active sides.

The growth over the last ten years or so in asset allocation-based strategies has spawned a mini-industry in portfolio optimization software. This software uses historical returns data for various asset classes (or, heaven forbid, actively-managed funds) to calculate correlation coefficients (measuring how the asset classes move relative to one another). With this information the software constructs "efficient" portfolios—combinations of the asset classes that produce the highest return for a given level of risk or the lowest risk for a certain return objective.

Sounds good. The problem is that asset class returns and their correlations change over time. So, that nice, thin "efficient frontier" line is actually a band above and below the line (Chart 1).

Chart 2 shows how the efficient frontier shifts when a different time period is used. What does this mean to investors? First of all, when you hear things like: "We use expensive, sophisticated optimization software to construct the most efficient portfolios" (implying, of course, that this alone makes it worth engaging their services) allow a skeptical "yea, right" smirk to come across your face. When they show you asset mixes like 12.3% and 21.7% try not to reach out and erase their decimal points (these guys take this stuff seriously). But most of all **DO NOT BELIEVE THE NUMBERS!!**

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*Don't Be Fooled... (cont.)***Chart 1: The Efficient Frontier With "Estimation Error"**

Now, I know what you're thinking: But Jeff, *you* show us all of these past performance numbers. What are we supposed to believe? Believe the **relationship** between the asset class returns and the different risk-adjusted portfolios. Understand that higher returns come with higher risk. And realize that the numbers you are looking at will almost certainly change.

We deliberately use returns data starting on January 1, 1973, the beginning of the steepest stock market decline since the 1929 Crash, in an effort to understate expected returns. Unfortunately, many advisors (and fund databases like Morningstar) show returns from 1975 or later, inflating returns to what I believe are unrealistic levels.

You do not need optimization software to develop an efficient, diversified portfolio. What you need are a basic understanding of asset class risks and returns and, most importantly, common sense. Dimensional Fund Advisors' Returns Program contains historical

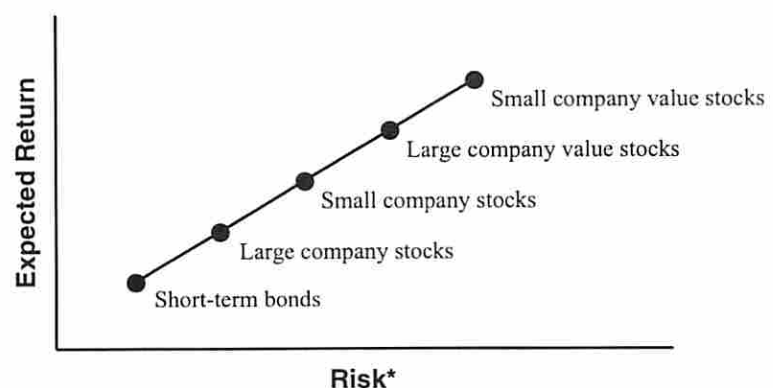
data on a wide variety of asset classes and market indexes. We use this program to *compare* and *present* risk/return characteristics for different combinations of assets classes. We *do not* use the software to tell us the "best" combination of these classes. This is dictated by the client's objectives which, in turn, are usually influenced by these long-term observations:

1. **Short-term bonds** are much less volatile but produce similar returns as long-term bonds.

2. **Large company stocks** produce higher returns than short-term bonds—but with higher risk.
3. **Small company stocks** produce higher returns than large company stocks—but with higher risk.
4. **Value stocks** (low price to book value)—both large and small—produce higher returns than growth stocks (high price to book value) and the stock classes overall—but with higher risk.
5. These relationships exist with **international stocks** as well.

TAM portfolios are constructed from low risk to high risk with an increasing percentage invested in the riskier asset classes. Because the correlations among the asset classes vary we can use the Returns Program to fine-tune allocations, but the bulk of the asset allocation work is influenced by the above realities of the financial markets.

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Chart 2: Increasing risk, increasing reward

*As noted in Table 1, the standard deviation of the returns for the value asset classes are actually lower than their "market" counterparts. But value stocks are considered riskier because of their weaker financial conditions.

Don't Be Fooled... (cont.)

Table 1 shows the returns for these asset classes from 1973 to 1994. It helps to see the "proof" of these relationships, but doesn't common sense suggest the same? It doesn't take a Noble Prize-winning academic to convince me that small company stocks are more volatile and risky than large company stocks. I'm also not dumb enough to buy these stocks if I don't expect to be compensated for this extra risk over time.

Table 1

<u>1/73 to 7/95</u>	<u>Annual Return Risk*</u>	
Short-term bonds	9.1%	0.4%
Large Co. stocks	11.6%	4.5%
Small Co. stocks	14.4%	6.0%
Large value stocks	15.7%	4.4%
Small value stocks	18.3%	5.3%

*Monthly standard deviation of returns

The risk/return relationships outlined above can and will be altered over different time periods. Advisors who start optimization analyses at the beginning of bull markets or use shorter time periods can mislead clients with unrealistic expectations and may over- or under-emphasize assets classes experiencing unusually strong or weak returns.

For example, an investor (or advisor) contemplating an asset allocation strategy in 1991 might have been tempted to base an optimization analysis on the past ten years. After all, it's not unusual in the investment business to believe that "times have changed" and to dismiss anything past ten years as ancient history. But as you can see

from Table 2, an optimization based on this shorter term period would have underemphasized small company stocks and over-emphasized international stocks.

Table 2

<u>1/81 to 12/90</u>	<u>Annual Return</u>
S&P 500	13.9%
DFA 9-10 Small Co.	7.6%
EAFE Int'l Index	17.0%
DFA Int'l Small	22.8%

I'm sure there were financial experts at the time questioning the existence of a small company premium (and some *real* nervous people at Dimensional Fund Advisors). But, sure enough, the inevitable happened: U.S. small companies staged a comeback and international stocks faltered (Table 3).

Table 3

<u>1/91 to 7/95</u>	<u>Annual Return</u>
S&P 500	15.6%
DFA 9-10 Small Co.	25.7%
EAFE Int'l Index	10.1%
DFA Int'l Small	6.7%

This demonstrates a potential danger of optimization analyses: the use of shorter time periods can lead to results that are not consistent with the basic principles (and common sense) of the financial markets. The total period, 1981 to July 1995, shows a more "normal" relationship, except for a continuing lag in U.S. small company returns and unusually high numbers across the board (Table 4).

Table 4

<u>1/81 to 7/95</u>	<u>Annual Return</u>
S&P 500	14.5%
DFA 9-10 Small Co.	13.0%
EAFE Int'l Index	14.8%
DFA Int'l Small	17.5%

The decade of the 80's also spawned the belief among many investors and advisors that the international markets are superior to the U.S. market on a return basis. As David Booth of Dimensional Fund Advisors suggests in his research, this is simply not the case. The international markets provide a *diversification* benefit and the small company and value premiums exist overseas as well, but to believe that the economies of Japan or Europe are inherently more attractive than ours, long-term, is probably a mistake.

I would like to say that TAM utilizes expensive, state-of-the-art computer software to build the most efficient asset class portfolios. It sounds good from a marketing point-of-view and it creates a certain mystery and air of sophistication that impresses some potential clients. But it's not true. We use common sense, we listen to our clients, and we tinker with a little DOS-based returns program DFA gives to us free. Most of all, we try to keep our clients focused on the important stuff and leave the hype to our competitors.

Performance Notes:

Asset Class Returns: 1-Yr. Bonds = DFA One-Year Fixed Income Portfolio; 5-Yr. Bonds = DFA Five-Year Government Portfolio; U.S. Large Stocks = Vanguard 500 Index Fund; U.S. Large Value Stocks = DFA Large Cap Value Portfolio; U.S. Small Stocks = DFA 9-10 Small Company Portfolio; U.S. Small Value Stocks = DFA Small Cap Value Portfolio; Pacific Large Stocks = Vanguard Pacific Index Fund; Europe Large Stocks = Vanguard Europe Index Fund; International Large Value Stocks = DFA Large Cap International Portfolio; Japanese Small Stocks = DFA Japanese Small Company Portfolio; Cont. Europe Small Stocks = DFA Continental Small Company Portfolio; U. K. Small Stocks = DFA United Kingdom Small Company Portfolio; Pac Rim Small Stocks = DFA Pacific Rim Small Company Portfolio; Emerging Market Stocks = DFA Emerging Markets Portfolio.

TAM Portfolio Returns Net of Fees: These are the actual returns of TAM portfolios in each risk category net of actual TAM management fees, custodial fees, and fund expenses. The "Growth" returns were calculated using a model portfolio from 12/31/92 to 4/30/93 and actual accounts thereafter. The "Aggressive" returns were calculated using a model portfolio from 12/31/92 to 3/31/93 and actual accounts thereafter. In both cases, the maximum TAM fee was deducted, representative custodial costs were deducted, and all mutual fund returns are net of expenses. The "Moderate" returns were calculated using actual account performance since inception. Past performance is no guarantee of future returns. This is especially the case with model portfolios which are not subject to specific economic or market factors.

Benchmarks: Balanced Fund & Capital Appreciation Fund Indexes: Lipper Analytical's indexes representing the 30 largest balanced mutual funds and 30 largest capital appreciation mutual funds in the country.

Asset Class Returns**Year-to-Date Through 9/30/95**

U.S. Large Value Stocks	35.9%
U.S. Small Stocks	35.5%
U.S. Large Stocks	29.7%
U.S. Small Value Stocks	28.9%
Europe Large Stocks	18.6%
U.K. Small Stocks	14.9%
5-Yr. Bonds	7.7%
1-Yr. Bonds	6.4%
Int'l Large Value Stocks	5.6%
Cont. Europe Small Stocks	5.2%
Emerging Market Stocks	1.2%
Pac Rim Small Stocks	0.1%
Pacific Large Stocks	-1.9%
Japanese Small Stocks	-12.4%

TAM Portfolio Returns**Through 9/30/95**

Risk (% stocks)	YTD 1995	1994	1993	Since Inception 12/92-9/95
Aggressive (95%)	+14.0%	+5.3%	+21.1%	+45.3%
Growth (85%)	+14.4%	+2.6%	+16.6%	+36.7%
Moderate (65%)	+12.8%	+2.1%	+14.0%	+31.3%
Benchmarks				
Balanced Fund Index	+19.5%	-2.2%	+11.7%	+30.5%
Capital Apprec. Index	+28.6%	-2.5%	+14.8%	+44.0%
S&P 500 Stock Index	+29.8%	+1.3%	+10.1%	+44.7%
Salomon Broad Bond Index	+13.6%	-2.8%	+9.9%	+21.3%
Morgan Stanley EAFE Index	+6.9%	+8.0%	+32.9%	+53.4%

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