

The Index Investor

Why Pay More for Less?

Global Asset Class Returns

Our December issue included a summary table showing how different asset classes performed in 2002 in terms of different currencies. We didn't realize it would be such a big hit with our readers! In response to requests from many of you, we will now be including an update of this table in each month's issue, showing year-to-date returns for each asset class.

| | <u>In USD</u> | <u>In AUD</u> | <u>In CAD</u> | <u>In EURO</u> | <u>In JPY</u> | <u>In GBP</u> |
|-----------------|---------------|---------------|---------------|----------------|---------------|---------------|
| US Equity | (2.60%) | (10.10%) | (9.57%) | (6.40%) | (3.06%) | (0.77%) |
| US Bonds | 1.30% | (6.20%) | (5.67%) | (2.50%) | 0.84% | 3.13% |
| AUS Equity | 5.60% | (1.90%) | (1.37%) | 1.80% | 5.14% | 7.43% |
| AUS Bonds | 6.59% | (0.91%) | (0.38%) | 2.79% | 6.13% | 8.42% |
| CAN Equity | 3.40% | (4.10%) | (3.57%) | (0.40%) | 2.94% | 5.23% |
| CAN Bonds | 6.63% | (0.87%) | (0.34%) | 2.83% | 6.17% | 8.46% |
| Euroland Equity | (11.20%) | (18.70%) | (18.17%) | (15.00%) | (11.66%) | (9.37%) |
| Euroland Bonds | 5.78% | (1.72%) | (1.19%) | 1.98% | 5.32% | 7.61% |
| Japan Equity | (7.10%) | (14.60%) | (14.07%) | (10.90%) | (7.56%) | (5.27%) |
| Japan Bonds | 1.17% | (6.33%) | (5.80%) | (2.63%) | 0.71% | 3.00% |
| UK Equity | (8.50%) | (16.00%) | (15.47%) | (12.30%) | (8.96%) | (6.67%) |
| UK Bonds | (0.38%) | (7.88%) | (7.35%) | (4.18%) | (0.84%) | 1.45% |
| World Equity* | (5.25%) | (12.75%) | (12.22%) | (9.05%) | (5.71%) | (3.42%) |
| World Bonds* | 2.25% | (5.25%) | (4.72%) | (1.55%) | 1.79% | 4.08% |
| *Non-US for USD | | | | | | |
| Commodities | 5.80% | (1.70%) | (1.17%) | 2.00% | 5.34% | 7.63% |

Model Portfolio Update

The objective of our first set of model portfolios is to deliver higher returns than their respective benchmarks, while taking on no more risk. The benchmark for the first portfolio in this group is an aggressive mix of 80% domestic equities, and 20% domestic bonds. Through the end of March, this benchmark had returned (5.9%) in yen, while our model portfolio had returned (3.8%). We have also compared our model portfolios to a set of global benchmarks. In this case, the global benchmark is a mix of 80% global equities, and 20% global bonds. Through the end of last month, it had returned (4.2%).

The benchmark for the second portfolio in this group is a mix of 60% domestic equities and 40% domestic bonds. Through the end of last month, it had returned (4.3%), while our model portfolio had returned (2.8%), and the global benchmark had returned (2.7%).

The benchmark for the third portfolio in this group is a conservative mix of 20% domestic equities and 80% domestic bonds. Through the end of last month, it had returned (0.9%), while our model portfolio had returned (1.0%) and the global benchmark 0.3%.

The objective of our second set of model portfolios not to outperform a benchmark index, but rather to deliver a minimum level of compound annual return over a ten-year period. Through last month, our 12% target return portfolio has returned (5.1%) year-to-date, our 10% target return portfolio has returned (3.8%) our 8% target return portfolio has returned (4.3%), and our 6% target return portfolio has returned (2.5%).

Equity Market Valuation Update

As we have previously noted, our valuation analysis rests on two fundamental assumptions: that over the long term, labor productivity growth in our six major regions will converge to between 2.5% and 3.5% per year, and that the long term real equity risk

premium is 4.0% per year. Given those assumptions, here is our updated market valuation analysis at 31 March, 2003:

| Country | Real Risk Free Rate | Equity Risk Premium | Required Real Return on Equities | Expected Real Growth Rate* | Div Yield | Expected Real Equity Return |
|-----------|---------------------|---------------------|----------------------------------|----------------------------|-----------|-----------------------------|
| Australia | 3.01% | 4.0% | 7.01% | 4.3% | 3.9% | 8.2% |
| Canada | 2.99% | 4.0% | 6.99% | 4.1% | 2.2% | 6.3% |
| Eurozone | 1.73% | 4.0% | 5.73% | 3.5% | 3.8% | 7.3% |
| Japan | 1.81% | 4.0% | 5.81% | 3.2% | 1.2% | 4.4% |
| U.K. | 2.03% | 4.0% | 6.03% | 3.5% | 3.9% | 7.4% |
| U.S.A. | 2.66% | 4.0% | 6.66% | 4.4% | 1.9% | 6.3% |

**This reflects not only 3.5% productivity growth, but also expected labor force growth.*

| Country | Implied Index Value* | Current Index Value at 2/28/03 | Current/Implied (productivity growth @3.5%) | Current/Implied (productivity growth at 2.5%) |
|-----------|----------------------|--------------------------------|---|---|
| Australia | 303.84 | 211.13 | 69% | 95% |
| Canada | 160.86 | 211.31 | 131% | 177% |
| Eurozone | 174.90 | 102.64 | 59% | 85% |
| Japan | 32.33 | 70.31 | 218% | 301% |
| U.K. | 353.54 | 229.35 | 65% | 91% |
| U.S.A. | 291.49 | 346.72 | 119% | 172% |

** Assuming 3.5% future productivity growth*

Mutual Funds' Sales, Operating, and Trading Costs

On March 12, 2003, the U.S. House of Representatives Committee on Financial Services held a hearing on "Mutual Fund Industry Practices and Their Effect on Individual Investors." The Committee's Chairman, Rep. Michael Oxley, began by noting that there are currently 95 million mutual fund investors in the United States, who can choose

between over 8,000 different funds. He asked, however, a pointed question: has this resulted in cost savings for investors? In response, he noted that "recent data indicates that the answer is 'no.' Fees and expenses, in fact, are going up, despite the efficiencies created by enormous economies of scale. He further noted that some fund fees still "are hidden or opaque, [which] precludes comparison shopping by investors" and competition based on fund costs. He went on to ask, "what are investors getting in exchange for these rising costs?" His answer? "Chronic underperformance...the Vanguard S&P 500 index fund has beaten seventy six percent of its actively managed peers over the past ten years."

In light of the increased attention [finally!] being given to actively managed funds' costs, we thought our readers would appreciate a detailed look at this issue.

An investor purchasing shares in a mutual fund (unit trust) pays up to three different types of costs.

A fund's Sales Load is traditionally deducted up front, and reduces the amount of money that is actually used to purchase shares in the fund. A sales load is, in effect, a one time commission payment that is used to compensate the intermediary (e.g., a broker, financial planner, or insurance agent) who sells the mutual fund shares to the investor.

Each year, shareholders in a mutual fund also pay for the fund's Operating Expenses. Broadly speaking, these include investment management fees paid to the fund's investment manager, fees to pay for fund administration, record keeping, and shareholder services, and fees to pay for the marketing of the fund to new shareholders.

Finally, mutual fund shareholders also pay the Trading Costs that are incurred when the fund's investment manager buys and sells securities. In the following sections, we will look at each of these costs in more detail.

Sales Loads

According to the U.S. Securities and Exchange Commission ("Report on Mutual Fund Fees and Expenses", December, 2000), while 70% of mutual funds charged front end sales loads in 1979, only 49% did by 1999. During the same period, the size of the average front end load also decreased, from 8.5% in 1979 to 4.75% by 1999. Offsetting this, however, was the fact that operating expenses increased more rapidly at load funds than at their no-load competitors. Again according to the SEC, in 1979 the average operating expense ratio for no-load funds was .75%, while at load funds it was .72%. By 1999, the average operating expense charge on bond and equity no-load funds had dropped three basis points (1/100 of one percent) to .72%, but had risen to 1.17% at load funds (the average expense ratio on equity load funds alone is even higher, at 1.84%). The mutual funds companies further complicated the sales load issue with their introduction of multiple share classes for the same mutual fund. "A" shares charge a front end sales load, but have operating expenses that are relatively lower than those charged on the other share classes. "B" shares typically charge a "back end" sales load if the fund is sold before a certain date (after which they convert to A shares), but during this period also charge higher operating expenses. Finally, "C" shares usually charge no front or back end sales load, but permanently charge higher annual operating expenses.

Operating Expenses

The first key point to understand about aggregate mutual fund operating expenses is that repeated academic studies have all come to the same conclusion: they are negatively correlated with fund performance. In other words, funds with relatively higher operating expenses are likely to deliver relatively lower returns than their lower cost peers. The second key point to keep in mind is that average fund operating expenses are relatively high, and have been increasing in recent years. For example, the U.S. securities and exchange commission found that average asset-weighted operating expenses on domestic bond funds (including indexed and actively managed funds) have increased from .70% in 1979 to .80% in 1999, while the average operating expense on domestic equity funds

increased from .74% to .90%. This average, however, is deceiving, because it includes both actively managed and index mutual funds. Average operating expense at actively managed mutual funds are significantly higher than the expenses charged by index funds. For example, in 2002, Lipper, Inc., estimated that the average operating expenses charged by actively managed U.S. equity funds equaled 1.61% of their assets under management (up from just .98% in 1978). Compare this to the Vanguard S&P 500 Index Fund (VFINX), which charged operating expenses of only .18%!

Three different charges contribute to a fund's overall expense ratio. The first is the fees paid to the fund's investment manager, which cover research, portfolio selection, and related costs, as well as the investment manager's profit. In his study "Mutual Fund Expenses", David Latzko found between 1995 and 2001, investment management fees averaged .59% of fund assets at a sample of 600 U.S. based equity, bond, and international mutual funds. One interesting aspect of investment management fees is the fact that, with few exceptions, they tend not to decline as the assets under management increase at a fund. Most studies of mutual fund performance have found this fact curious, to say the least, as most of these costs are fixed (e.g., it doesn't take ten times more research and portfolio management to run a fund with ten times more assets).

The second set of charges cover a mutual fund's administrative costs. Latzko's study found that these averaged .20% for shareholder servicing and communications, .04% for audit and legal fees; .04% for custodial services, .03% for share registration services; and .01% for director and trustee compensation and expenses. Unlike investment management fees, a number of studies have found that these are the fees that give rise to the scale economies that have been observed in mutual fund management (e.g., the SEC study found that the average operating expense in 1999 for a fund with less than U.S. \$10 million in assets was 1.61%, while it averaged only .87% at funds with over \$1 billion in assets).

The third contributor to operating expenses are costs paid for the marketing and distribution of the fund. These are commonly known as "12b-1" fees, and are named

after the 1980 change in regulations that forced funds to separately break them out in their results. Based on Latko's research, they average .20% of fund assets per year. Given that growth in assets under management typically reduces relative returns (while raising management fees), whether or not these costs should be born by the fund's shareholders is a very contentious issue. The argument put forward by the mutual fund industry has been that by attracting assets, 12b-1 fees lead to the creation of scale economies that benefit all the fund's shareholders. If this argument were true, one would expect to see that funds charging 12b-1 fees had lower operating expenses than funds that did not charge them (because of the aforementioned scale economies). Unfortunately, multiple academic studies have found just the opposite: funds that charge 12b-1 fees tend to have higher, not lower operating expenses than those that do not charge them. For example, in his aptly named study, "My Pocket or Your Pocket?", Nicolaj Siggelkow from the Wharton School analyzed "data on essentially all U.S. mutual funds in existence between 1992 and 1996, [and found] evidence suggesting that if marketing expenses are paid via 12b-1 fees, total expenses for fund shareholders rise. Contrary to the SEC's original intent, and the mutual fund industry's claims of a neutral effect, 12b-1 fees actually increase shareholder expenses."

Trading Costs

Trading costs are undoubtedly the most insidious drag on fund performance, because they are both large and generally invisible to investors.

Broadly speaking, a fund's trading costs are a function of its turnover ratio -- that is, how often it buys and sells securities during the course of a year. In general, actively managed funds are much more active traders -- and incur much higher trading costs -- than index funds. It is not unusual for an actively managed fund to have 100% turnover each year (i.e., each year it sells all the securities it owns, and replaces them with new ones). By comparison, we estimate that the weighted average annual turnover for domestic equity index mutual funds in the United States is only 21%, and only 7% for U.S. based

international equity index mutual funds (which makes sense, given the higher dealing costs abroad).

Trading costs can be broken down into four categories. Explicit brokerage commissions are generally paid only on equity trades, and cover the cost of executing and clearing the trade. Bonds (as well as equities being traded on a principal basis) incorporate these costs in the difference between the bid and offer prices (i.e., the "spread") posted by firms operating in this market. The second source of trading costs is the impact that the trade has on the market price for a given security. For example, if its trade is large enough relative to the available supply of a security, a mutual fund's decision to buy it can cause its price to rise in the market. Brokerage commissions and price impact are typically called "explicit" trading costs. The third source of trading costs is the impact of the delay that sometimes occurs while a fund is waiting to complete the execution of a buy or sell order. During this period, other investors can trade in the same direction (perhaps based on the same insight), causing the market price of a security to rise or fall relative to the original price at which the trade was entered. Finally, execution delays also impose opportunity costs, in the form of follow-on trades that could not be made because a previous trade had not yet closed.

A number of academic studies have analyzed fund trading costs, with most focusing on brokerage commissions and market impact. Latzko's study estimated that on average annual brokerage commission costs amounted to .29% of a typical equity mutual fund's assets under management. Siggelkow's study concluded that annual brokerage commission costs amounted to .30% of a typical equity fund's assets. In "Mutual Fund Trading Costs", Chalmers, Edelen, and Kadlec estimated that average brokerage commission costs at equity mutual funds were .31% of assets under management, and that spread costs added a further .47% (that is, total explicit trading costs amounted to .78%). They also found a significant negative correlation between fund returns and fund trading costs (e.g., the higher the trading costs, the lower the fund's returns). They also estimated that the higher rate of capital gains tax realization caused by high fund turnover (which also drove high trading costs) cost an investor an additional .36% per year

(expressed as a percentage of the fund's total assets). Finally, Wayne Wagner, the Chairman of Plexus Group (a company that specializes in helping funds reduce their trading costs) presented some very interesting information at the House Finance Committee hearings earlier this month. His company estimates that the average cost for an institutional trade typically exceeds 1.5% of a trade's value (with higher amounts incurred by growth and small cap funds, because they typically deal in less liquid markets). This was based on an average commission cost of .17%, an average spread impact of .34%, an average delay cost of .77%, and an average opportunity cost of .29% - or 1.57% in total. Assuming an equity mutual fund has annual turnover of 100%, these per trade figures can be doubled to estimate average trading costs as a percentage of the fund's assets under management: brokerage commissions, .34% (yet again!), spread impacts, .68%, delay costs, 1.54%, and opportunity costs, .58% -- or 3.14% annually!!!

And the beauty of this (at least from the fund manager's perspective), is that shareholders never see this figure! The only trading cost that must be explicitly disclosed is brokerage commissions; however, to see them for the funds you own, you have to specifically ask for a copy of a document known as the "Statement of Additional Information." The other costs aren't ever disclosed. In fact, like the brokerage commissions, they are all capitalized into the purchase price of the shares bought by the fund -- in effect, funds with higher trading costs (like actively managed funds) purchase securities at a higher average cost than their competitors (like index funds) that do less trading, which inevitably reduces the returns they earn for their shareholders.

Finally, there is one more important issue hidden inside a fund's trading costs: the use of "soft dollars". In a 1998 report, the U.S. Securities and Exchange Commission described the issue this way. "Research is the foundation of the [active] money management industry. Providing research is one important, long standing service of the brokerage business. Soft dollar arrangements have developed as a link between the brokerage industry's supply of research and the money management industry's demand for research. Broker-dealers typically provide a bundle of services, including research and execution

of transactions. The research provided can be either proprietary (created and provided by the broker dealer) or third party (created by a third party, but provided by the broker dealer). Because commission dollars pay for the entire bundle of services, the practice of allocating certain of these dollars to pay for the research component has come to be called 'soft dollars'...In soft dollar arrangements, an investment adviser [e.g., a mutual fund manager] selects the brokers that will execute trades and provide research and other services to the adviser...Under traditional fiduciary principles, a fiduciary cannot use assets entrusted by clients to benefit itself. “

“As the SEC has recognized, when an adviser uses client commissions to buy research from a broker-dealer, it receives a benefit because it is relieved from the need to produce or pay for the research itself. In addition, when transactions involving soft dollars involve the adviser [paying higher commissions than the lowest available] or receiving executions at inferior prices, advisers using soft dollars face a conflict of interest between their need to obtain research and their clients' interest in paying the lowest commission rate available and obtaining the best possible execution...[As a result], Congress created a safe harbor under section 28 (e) of the Securities Exchange Act of 1934 to protect advisers from claims that they had breached their fiduciary duties by causing clients to pay more than the lowest available commission rates in exchange for research and execution...[Under section 28 (e)], the controlling principle used to determine whether something is research is whether it provides lawful and appropriate assistance to the adviser in the performance of his or her investment decision making responsibilities." Unfortunately, neither Congress nor the SEC clearly defined what constituted "lawful and appropriate assistance to the adviser." As a result, since the use of soft dollars has grown, and is now estimated to exceed \$1 billion per year. Moreover, many of the uses to which these soft dollars are put are questionable. A 1998 audit of a small number of investment advisers by the SEC found that twenty eight percent of them were inappropriately using soft dollars to pay for "non-research" expenses. On top of this, most of these soft dollar arrangements between advisers and broker-dealers are never written down, leading the SEC to find that this is an area where information disclosure remains inadequate.

As David Silfen (a partner at Goldman Sachs) noted in his July 12, 1993 testimony on soft dollar issues (to the House Subcommittee on Telecommunications and Finance), "Conflicts of interest are inherent in soft dollar arrangements. The money manager receives the products and services paid for by soft dollars. The client, often unknowingly, pays for these products and services as part of the brokerage commissions charged to his account. This situation presents an obvious temptation to the managers to buy items that benefit itself rather than the client, or items, such as general research reports, quotations services, and computer hardware and software that other managers consider their own responsibility under their basic management fee. The money manager may also pay too much in commissions, or engage in unnecessary trading so as to generate more commission and thus more soft dollars."

Harold Bradley, from American Century Management seemed to confirm Silfen's fears when he noted at the March 12, 2003 House Finance Committee Hearing, that "at its worst, section 28 (e) allows some managers to boost profits during bad market conditions by paying more bills with investor commissions. Greenwich Research reported that a 27% decline in assets under management for the typical institutional manager in 2001 sharply reduced management fee income. Investment managers responded to the decline in assets, in part, by boosting soft dollar amounts paid by 17%, according to the self-reported study (A Closer Focus on Trading Costs, April, 2002)."

Theoretically, commissions inflated with soft dollars pay for research, which in turn reduces the amount of research a fund's investment manager needs to perform. This should lead to reduced investment management fees at funds that pay inflated soft dollar trading costs. Shockingly (as you've no doubt already guessed), this doesn't seem to happen in practice. Latzko's study ("Mutual Fund Expenses") found that "soft dollar payments to brokers for research services do not reduce the explicit investment advisory fees paid by fund shareholders." Siggelkow's study also found "no evidence that funds which use soft dollars (and thereby incur inflated brokerage costs) reduce their investment management fees." In short, it appears that many advisers are using soft dollars to boost their profits at the expense of shareholder returns.

Conclusion

This analysis makes clear, yet again, the logic behind three fundamental maxims of mutual fund investing:

- Don't pay sales loads.
- Look for funds with low operating expenses.
- And look for funds with low turnover (which drives trading costs).

- (And their obvious implication: use index tracker funds!)

This analysis also makes it clear that the time has come for the U.S. Congress and the Securities and Exchange Commission to take more aggressive action on mutual fund sales, operating, and trading costs. At the March 12th hearing, Gary Gensler (another well known critic of active fund managers) noted that "mutual funds have constructed a system where the costs are practically invisible. We all have to write a check to our utility or mortgage company, but we never pay a bill for mutual fund management. Such costs are simply deducted from our monthly returns, or taken off the top when we buy a load fund [or, as we've seen, capitalized into the price of the securities purchased by the fund]. How else to explain the fact that many Americans react furiously to the \$1.50 ATM surcharges they pay twenty times a year (\$30), yet rarely utter a peep when they pay [far larger amounts to the companies that manage their money]?"

In light of this, at the same hearing a representative from the General Accounting Office put forth one of the preliminary conclusions from his organization's current investigation of mutual fund costs. "We find that mutual funds usually do not compete directly on the basis of their fees, and we recommend that the SEC consider additional disclosures regarding fees to increase investor awareness and to encourage additional price competition among funds."

Last, but certainly not least, John Montgomery, the founder of Bridgeway Funds, treated the U.S. Congress to an even more succinct recommendation: "You should not work to improve the disclosure of soft dollars; you should simply stop the practice altogether. As a fellow Texan once said, 'if you see a snake, just kill it -- don't appoint a committee on snakes'."

Amen.

Asset Location and Tax Efficiency

To encourage retirement saving, many countries have created special tax advantaged accounts that let investors defer or avoid taxes on their long term investments (e.g., Superannuation Plans in Australia, Registered Retirement Savings Plans in Canada, Individual Retirement Accounts in the United States, or Personal Pensions in the U.K.). In this article, we will refer to these as "tax deferred accounts", or TDAs.

Investors also accumulate savings outside their TDAs (e.g., because they are saving for shorter term goals, like buying a house, or because their savings exceed the maximum amount that can be contributed to a TDA). In this article, we will call these "conventional savings accounts", or CSAs. To encourage savings in CSAs, most countries tax long term capital gains (that is, profits on the sale of an investment held for one year or more) at a lower rate than income from dividends, interest, and gains on the sale of investments held for less than one year.

The combination of TDAs and capital gains tax preferences raises an important question for investors: how do I divide my assets between my tax deferred and my conventional saving accounts? This is known as the "asset location" issue.

In principle, the resolution of this issue seems straightforward: to the extent possible, investments whose returns bear the highest effective tax rates should be held in the TDA, and all other assets in the CSA. In practice, things get more complicated.

The first challenge is to rank different types of assets according to their effective tax rates. Unfortunately, this is not a subject that most investors are familiar with. Broadly speaking, different asset classes can be ranked as follows:

- **Non-Government Bonds.** Generally speaking, most of the return on a bond comes from the interest payments one receives; capital gains generally account for a much smaller portion of a bond's annual total return (that is, interest received plus the percent change in the bond's market value over a one year period). Because capital gains are so small, most income from an investment in non-government bonds (or a mutual fund that owns them) is taxed as ordinary income.
- **Government Bonds.** The major difference between government and non-government bonds is that the former often have certain tax benefits, which reduce the effective tax rate investors pay on the income they receive from them. For example, in the United States, earnings on bonds issued by the federal government are exempt from state and local taxes, while earnings on bonds issued by state and local governments are exempt from federal taxes.
- **Actively Managed Equity Mutual Funds.** Equity mutual funds invest in stocks and pass on some of the annual earnings on these investments to their shareholders. The annual total return to a shareholder in an equity mutual fund is divided into four parts: dividends received, short-term capital gains received (which, like dividends, are taxed at the ordinary income rate), long-term capital gains received (which are generally taxed at the preferential capital gains rate), and unrealized capital gains (i.e., price appreciation on shares owned by the fund that are not sold during the year). Actively managed equity mutual funds tend to generate high levels of taxable income for investors because they tend to frequently trade the shares that they own. Different

writers have proposed different reasons for this frequent trading. Some have noted that, because fund managers' compensation is tied to the size of the fund, and because fund size is driven by a fund's relative pre-tax returns, managers have a strong incentive to sell their winning positions to "lock-in" their performance gains, particularly when their total return is at the high end of their peer group. Others have noted that frequent turnover may be caused by managers' belief that the presence of large unrealized capital gains in a fund acts as a deterrent to inflows from new investors. The underlying belief is that new investors won't want to pay a share of the taxes when these gains are eventually realized, and thereby effectively subsidize the returns earned by existing investors in the fund.

- Indexed Equity Mutual Funds. Because index funds strive to match an index rather than outperform it, they tend to engage in much less buying and selling of shares during the course of a year than a typical actively managed fund. To be sure, some turnover does occur, generally for three reasons. First, index funds buy and sell shares when companies are added to and dropped from the index they track. Second, in order to closely track their targets, index funds tend to hold very low levels of cash (that is, they are usually close to "fully invested"). Generally speaking, this is a good thing (because the shares they own tend to earn higher returns than cash). However, if the net flow of cash into the index fund turns negative (that is, more investors are selling their shares in the fund than are buying them), this can cause problems, because it forces the fund to sell assets and realize capital gains. This brings us to the third reason index mutual funds buy and sell shares: to minimize these capital gains. At least in the United States, mutual funds cannot pass through their capital losses to their shareholders; they only pass through their net capital gains. Therefore, in order to minimize the amount of taxable gains they pass on to their shareholders, index mutual funds trade in order to realize capital losses which they can use to offset their gains, and in so doing minimize the taxes their shareholders must pay.
- Exchange Traded Index Funds (ETFs). Collective investment vehicles (e.g., a mutual or exchange traded fund) can be either "open ended" or "closed end". The index

equity mutual fund just described is an open ended fund, because the size of its underlying investment portfolio rises and falls as investors buy and sell shares in the mutual fund itself. In contrast, an exchange traded fund can be thought of as a type of closed end fund, in which the size of the underlying share portfolio is fixed (the situation is actually more complicated, but the additional detail doesn't add anything to this discussion). Rather conducting their buy and sell transaction with the mutual fund itself, shareholders in a closed end fund buy and sell from each other. From a tax point of view, this has a clear advantage, because it does not force the fund to realize capital gains to accommodate the needs of the funds' shareholders (though those shareholders will still receive dividends paid on the underlying shares, as well as capital gains triggered by changes in the composition of the index). Theoretically, this should result in less capital gains income for shareholders in an exchange traded equity index fund than for shareholders in an equity index mutual fund (see the article "ETFs Finish in First Place" in the May 1, 2002 edition of Financial Planning Interactive for an example, based on a very short data set, that shows that this has in fact been the case for most, but not all cases where an ETF and a mutual fund track the same index).

- Individual Equities. When individual equities are directly owned by an investor, the realization of capital gains and losses is generally under the investor's control (except in the case of bankruptcy or a cash based acquisition of the company's shares). This means that the only taxable income from these investments is generated by dividend payments received (assuming the company pays dividends).

Broadly speaking, the findings of the relatively limited number of academic studies of the asset location issue suggest that non-government bonds and actively managed mutual funds should generally be held in a TDA, while equity index mutual funds and ETFs, and directly owned equities should be held in conventional accounts. Finally government bonds can be held in either account, depending on specific circumstances. Because this still seems a bit confusing, let's look at some of the academic studies in more detail.

In their paper "Asset Location in Tax-Deferred and Conventional Savings Accounts", Shoven and Sialm assume the point of view of an investor who primarily holds mutual funds. They present data covering 1979 to 1998 that show the percent of average annual total return paid out as dividends and capital gains by various types of funds:

| Type of Fund | Dividend | ST Capital Gain | LT Capital Gain | Unrealized Capital Gain | Total |
|--|-----------------|------------------------|------------------------|--------------------------------|--------------|
| Top Five Actively Managed Equity Mutual Funds* | 23.5% | 4.7% | 46.9% | 24.9% | 100% |
| Vanguard S&P 500 Index Mutual Fund | 21.0% | 0.4% | 11.1% | 67.5% | 100% |
| Vanguard Taxable Bond Index Fund | 90.1% | 0.9% | 4.3% | 4.7% | 100% |

*These were the top 5 funds by assets in 1961 (the start of the study).

As you can see, the taxable bond fund is the least tax efficient, followed by the actively managed equity mutual funds. The equity index fund is clearly the most tax efficient of the three. The authors also estimate the effects of three key investment management decisions on terminal after-tax wealth after 25 years (assuming a target asset allocation of 50% equities and 50% bonds). Choosing to use an equity index fund instead of an actively managed equity mutual fund adds 13.5% to terminal wealth (assuming all investments are held in a conventional savings account). Choosing to take advantage of a tax-deferred account (but with the same 50% equity, 50% bonds asset allocation in both the TDA and CSA) adds a further 24.3% to after tax terminal wealth. Finally, optimally allocating one's assets to the TDA (which holds the taxable bonds) and the CSA (which holds the equity index mutual fund) adds a further 8.8% to after-tax terminal wealth. All together, this adds up to 46.6% more after tax wealth after twenty five years -- a very

significant improvement over the base case (actively managed mutual funds held in a taxable account).

The authors conclude that if one is going to use actively managed equity mutual funds, they should be held in the tax-deferred account, and paired with (tax exempt) municipal bonds in the taxable account. In contrast, if one is going to use equity index mutual funds, they should be held in the taxable account, with taxable bonds held in the tax-deferred account.

"Asset Location for Retirement Savers" by Poterba, Shoven, and Sialm uses actual historical returns and tax rates (rather than simulations) over the 1962 to 1998 period to explore the asset location issue. As in the previous study, they assume a target asset allocation of 50% equities and 50% bonds, and note the important point that the gains from optimal location diminish as one moves away from an equal mix of assets with significantly different effective tax rates. In their analysis, the returns on actively managed equity mutual funds were based on a sample of the twelve largest funds at the end of 1961 (when they represented 29.2% of total equity mutual fund assets). The authors compare the results of two different asset location strategies. "The first strategy, 'defer stocks first', gives priority to holding equity mutual funds in a saver's tax-deferred account, while the second strategy, 'defer bonds first', gives priority to holding fixed-income investments in the tax-deferred account." The authors find that "over the thirty seven year span we consider, [investors who use actively managed equity mutual funds] would have accumulated a larger stock of wealth if they had held these funds in their tax deferred account than if they had held them in a conventional taxable account. The explanation for this apparent contradiction of the oft-stated 'bonds in the tax deferred account' prescription has two parts. First, many equity mutual funds impose substantial tax burdens on their investors. This raises the effective tax rate on investing in equities through mutual funds rather than [directly buying and holding individual stocks]. Second, taxable investors who wish to hold fixed income assets can do so either by holding taxable bonds or by holding tax-exempt bonds. The results suggest that the

effective tax rate on tax exempt bonds [which equals $1 - (\text{return on tax-exempt bonds}/\text{return on taxable bonds})$] was less than the effective tax rate on actively managed mutual funds [during the 1962-1998 period of the study]."

The authors also performed a very interesting analysis that tested the impact of adding inflation-protected bonds to the asset location problem. They note that "the corporate and municipal bond funds in the previous asset allocation and asset location analysis are exposed to three risks that can be reduced with inflation protected government securities. Default risk, inflation risk, and reinvestment risk (uncertainty about the rate at which future payments received can be reinvested)...Since 1997 the U.S. government has issued inflation indexed bonds which essentially eliminate all these risks. TIPS are U.S. government bonds with fixed maturities, whose principal amount is adjusted each year to reflect inflation. Both the interest payment and the principal adjustment (which isn't paid until maturity) are fully taxable each year if the TIPS are held in taxable accounts. TIPS eliminate default and inflation risk, but are still subject to reinvestment risk. Interest received on TIPS is exempt from state and local taxes...The second type of inflation indexed security issued by the U.S. Government is the Series I savings bond. It is a zero coupon instrument on which taxes are deferred until redemption. Like TIPS, interest on Series I bonds is exempt from state and local taxes. Series I bonds can be redeemed any time at par, with some penalty if this is done before five years after the bonds are purchased. Compound interest accrues for up to 30 years. However, individual investors can only purchase \$30,000 of Series I bonds each year... I-bonds yield slightly less than TIPS. However, because of their tax-deferred feature, they are preferable to the TIPS in a taxable account. In a TDA, TIPS are preferred, because there is no need for the I-bond's tax deferral in a TDA...Our analysis was repeated using Series I bonds in the taxable account instead of tax exempt municipal bonds (under the defer stocks first strategy), and TIPS instead of other taxable bonds in the TDA (under the defer bonds first strategy) [and using imputed values for inflation protected bonds and equity mutual funds for the years in which these products were unavailable]."

The results of this analysis are shown in the following table, with the end of period wealth for different strategies (in 1998) scaled on the results for the "defer bonds first while using index funds" strategy (which equals 100).

End of Period After-Tax Wealth, 1962-1998

| | Use Active Equity Mutual Funds | Use Index Equity Mutual Funds |
|--|--------------------------------|-------------------------------|
| Equity to TDA, I-Bonds to CSA ("Defer Stocks First") | 91 | 97 |
| TIPS to TDA, Equity to CSA ("Defer Bonds First") | 85 | 100 |

* Note: this analysis assumed a relatively low 3.0% real yield on TIPS, and 2.6% real yield on I-bonds.

The authors conclude that "if inflation protected bonds had been available for the last four decades, and their yields had been similar to those on current index bonds, then investors would have generated more wealth by holding actively managed funds in a tax deferred accounts and I-bonds in a taxable account than by following other strategies. Investors who wish to hold index funds, however, would have accumulated more wealth by holding such funds in their taxable account, with TIPS in their tax deferred account."

Finally, the authors also ran repeated simulations (technically, it was a resampling analysis) to further test the impact of using inflation protected. They found that "introducing inflation protected bonds significantly increased the outcomes at the lower tail of the distribution of possible results", which is critically important for "risk averse investors [who]...put a much higher weight on the lower tail of the probability distribution."

The next two studies move from theory to practice, and examine the extent to which investors actually follow optimal asset location strategies. In "Asset Allocation and Asset Location Decisions", Bergstrasser and Poterba examined data from the Survey of

Consumer Finances conducted by the U.S. Federal Reserve. They found that in 1998, forty five percent of U.S. households had some assets in a tax-deferred account. However, when they examined the actual asset location strategies in use by these households, they found that, contrary to what theory would suggest, "asset allocation in tax deferred accounts was quite similar to asset allocation in taxable accounts (equity represented 68% of the former, and 72% of the latter)."

In their paper "Are Individual Investors Tax Savvy?", Barber and Odean take a closer look at the behavior of investors with accounts at both discount and full service brokerage firms, and try to "determine the extent to which individual investors consider taxes while making asset location decisions." Their findings suggest that there is much room for improvement. The good news is that they "find a strong preference for holding equity mutual funds in investors' TDAs and individual stocks in their taxable accounts", and that "virtually all households owning municipal bonds correctly hold them in their taxable accounts."

However, they also "find that the average household misallocates twenty percent of its equity mutual funds and one third of its taxable bonds to its taxable accounts." Two possible explanations for the latter are examined and found wanting. One argument is that people allocate taxable bonds to their taxable accounts to meet future liquidity needs (e.g., the downpayment on a house) for which they do not want to take equity risk. However, Barber and Odean "find that contrary to the predictions of the liquidity hypothesis, households that locate taxable bonds in their taxable accounts are less likely to make large withdrawals [from these accounts] and, on average, make greater net deposits into them than other households."

The second possible explanation for the unusually large holdings of taxable bonds in taxable accounts is that households do this because of a lack of capacity in their TDAs. However, Barber and Odean find that "nearly seventy percent of households could locate all of their taxable bonds in their TDAs."

As a result of their analysis, the authors conclude that " either existing models of optimal asset location are incomplete, or a substantial fraction of investors are misallocating their assets."

Finally, the authors also make the critically important point that "the gains from optimal asset location are small if investors fail to fully capitalize on the tax-deferral strategies available on equity...Many investors trade actively in their taxable accounts. The average household has a holding period of less than two years for individual stocks and less than four years for equity mutual funds. Turnover in taxable accounts generally exceeds turnover in tax deferred accounts. While optimal tax management may require some trading of equities in taxable accounts (i.e., the harvesting of losses to shelter taxable income), investors can improve the after tax returns on equity by deferring the realization of capital gains...Unfortunately, investors realize gains at a faster rate than losses. From a tax perspective, this active realization of gains is arguably the biggest mistake that many investors make."

In "Loss Harvesting: What's It Worth to The Taxable Investor?", Arnott, Berkin and Ye quantify just how costly this mistake can be. They begin by noting that "in effect, there is both "good turnover" and "bad turnover." "The former, from a taxable investor's perspective, is turnover which reduces the year-end tax burden by realizing a capital loss, which delivers a near term reduction in taxes...Bad turnover is trading which realizes a capital gain, especially a short-term capital gain, thereby triggering an increased year-end tax bill...Harvesting losses (realization of losses for tax purposes so they can be offset against any gains an investor may have) often can bring capital gains taxes down to zero. How much is this worth to the taxable investor? Specifically, if we assume no stock selection skill whatsoever, how much can we increase the after tax returns on a portfolio by combining loss harvesting with otherwise passive portfolio management [i.e., indexing]?" The authors' simulation analysis (which assumes only an eight percent average pre-tax equity return over twenty five years) finds that "tax advantaged investing

can consistently add roughly 60 basis points of after-tax return per annum, over and above index fund results, without any stock selection sill whatsoever!"

They go on to note, however, that there is a potential problem with this loss harvesting strategy. "If we harvest losses, we are cutting the cost basis of the holdings in the portfolio every opportunity we have, while the market typically is growing. What about the deferred tax obligation? Isn't it much higher in the tax-advantaged program than [if tax loss harvesting isn't used]? Absolutely. This should not be overlooked, because [under U.S. law] the deferred tax eventually needs to be paid unless one takes advantage of the step-up in cost basis on death [or donation of the assets to charity]. Still, after twenty five years the author's simulation finds that "even after liquidation, and the payment of all deferred taxes, the loss harvesting strategy [still] yields 14% more wealth for an investor in a 35% tax bracket than simple passive investing. For an investor in the 50% marginal tax bracket, the improvement in wealth after 25 years is 20%."

So where does this leave us? We believe that taking all these analyses into account leaves us with five important points to remember:

- Where possible, avoid realizing capital gains.
- To the extent possible, harvest losses to offset any capital gains you realize (and ordinary income as well).
- Locate your taxable fixed income investments (and others that are highly taxed) in your tax deferred account.
- Locate your indexed equity investments in your conventional savings account.
- To maximize tax benefits, consider substituting exchange traded equity index funds for index mutual funds (recognizing, however, that there are also other trade-offs involved that favor mutual funds over ETFs. See our August, 2002 article: "Using ETFs In Our Model Portfolios").

Why Are Actively Managed Funds Still So Popular?

For most readers of *The Index Investor*, the evidence against investing in actively managed funds probably is already convincing, and the previous two articles have further added to it. Unfortunately, this is not the case for most investors. Index products still account for only about ten percent of total individual investment in U.S. mutual and exchange traded funds. The question we have to ask ourselves is why this is so.

Explanations for apparently irrational behavior generally fall into two categories. Either investors lack adequate information about the advantages of index products, and/or they fail to process the information they have correctly.

Various researchers have suggested a number of different explanations for investors' lack of adequate information. First, investors tend to be myopic, and evaluate their funds' performance annually. This works against index products, as over one-year periods, roughly fifty percent of actively managed funds will outperform index funds in the same asset class. However, because superior active performance does not persist from year to year, over longer periods of time fewer and fewer active funds outperform their indexed competitors in the same asset class.

A closely related issue is the nature of information (also known as “cues”) that attracts investors' limited attention. Research has shown that readily available information often has a higher impact on one's beliefs than information that is more costly (in terms of time and cognitive resources) to obtain and process. Seen in this light, it is no surprise that many actively managed funds are supported by heavy advertising that emphasizes their gross returns over one year, rather than their longer term returns after sales loads, expenses, and taxes have been taken into account (and trading costs too, but that's another story). Research also has shown that the way we allocate our limited attention to different information cues is both an individual and a social phenomenon; we naturally tend to pay attention to the cues our friends consider important. This is another reason

that actively managed funds spend so much money on advertising that emphasizes their short-term gross returns.

Investors' lack of adequate information also has its roots in what is known as the "confirmation bias." In essence, the confirmation bias has two key elements. First, it takes much more information to change a belief than it does to form one. Second, because we prefer consistency in our beliefs, we have trouble perceiving information that contradicts them, and find supporting cues much easier to recognize and absorb. This means that people who have invested in actively managed funds are unlikely to seek out information that supports index investing, and will require repeated exposure to it before they change their beliefs.

Finally, many investors who rely on advisors to provide them with fund recommendations fail to pay enough attention to the way in which these advisors are paid. They neglect the important information that the incentives of advisors whose compensation comes from commissions on the products they sell are not well aligned with the goals of the investors who rely on them for advice. At the margin, these advisors' incentives will lead them to prefer actively managed funds with high sales loads (out of which their commissions are paid) rather than no-load index funds.

The second major explanation for investors' apparently irrational belief in the superiority of actively managed funds is that they fail to correctly process the information that is available to them. For example, research on the prevalence of over-optimism and overconfidence is quite extensive; it has even been suggested that these traits are, in moderate amounts, evolutionary adaptations that enhance a person's social attractiveness. (Anybody who has tried to decide whom to talk with at a party intuitively recognizes the potential validity of this view.) Practically, this causes many investors to be overoptimistic about the future returns they expect on their actively managed funds, and overconfident that past performance is actually a good predictor of a fund's future success. Overconfidence also works to active funds' advantage via another route. It leads some investors to believe that the best way to minimize risk and maximize returns

is to quickly sell losing funds while buying recent winners, rather than holding a well-diversified portfolio of index funds. In practice, this belief leads to higher trading volume, taxes and transaction costs, and lower returns than would have been realized using the index approach.

Another cognitive processing issue is related to the way investors choose between competing alternatives. Some researchers have proposed that people take into account not only rational factors, but emotional ones as well. For example, regret theory suggests that investors measure their performance relative to others, and have a strong aversion to appearing inferior when the task involved doesn't appear to be hard. Given a myopic focus on one year gross returns, this can easily lead an investor to prefer actively managed funds to an index product that will, in any given year, under-perform about half the funds in its asset class.

Finally, when it comes to processing information, most human beings also have a tough time learning from their mistakes. As previously noted, research has shown that people derive emotional benefits from maintaining consistent beliefs. To enable us to do this, we tend to change our stories in retrospect in order to justify our past decisions, even if their results have turned out poorly. This is known as "hindsight bias", which in some ways is the mirror image of the previously discussed confirmation bias (the former being backward looking, and the latter forward looking). For example, how many people do you know who explain the negative returns on their actively managed funds by saying "the whole market has been down", while avoiding the fact that their returns have lagged behind those of index funds in the same asset class (even on a gross return basis)?

While enlightening, these explanations leave unanswered an important question: which of these two factors (inadequate information or incorrect processing) provides the best explanation for investors' continued interest in actively managed mutual funds?

We searched for data that could help us answer this question, and came up with some interesting findings. On the information front, many surveys show that in general

investors have a low level of "financial literacy." For our purposes, however, we chose to use the findings from an annual survey that Vanguard does in conjunction with Money Magazine. The ninety five percent confidence interval for this survey is plus or minus three percent (that is, we can be 95% confident that the true value of a variable is within plus or minus 3% of the survey's estimated value). Last year, this survey found that only sixteen percent of investors understood the concept of an index fund.

Finding data that reflected the extent of investors' cognitive processing problems was more difficult. After looking a lot of alternatives, we settled on the Retirement Confidence Survey, which has been conducted for the past twelve years by the Employee Benefits Research Institute and the American Savings Education Council. The estimates from this survey also have a 95% confidence interval of plus or minus 3%. Our objective was to derive an estimate of the percentage of overconfident investors, which we took as a proxy for the broader set of processing problems. To begin with, the survey found that seventy two percent of investors were confident they were doing a good job of preparing financially for their retirement. However, the survey also found that only twenty four percent of investors had actually calculated (or had an advisor calculate) how much money they would need to save in order to live comfortably in their retirement. We took the difference between these two figures (72% - 24% = 58%) as our estimate of the percentage of investors who are overconfident.

Combining our estimates for the percentages of investors suffering from information and processing related shortcomings gives us this estimate of the underlying dynamics driving investors' continued over-reliance on actively managed mutual funds:

| | Well-Informed (16%) | Not Well Informed (84%) |
|--------------------------------|----------------------------|--------------------------------|
| Overconfident (58%) | 9% | 49% |
| Not Overconfident (42%) | 7% | 35% |

If one assumes that investors who are well-informed and not-overconfident are the ones most likely to invest in index funds, then the 7% estimate from this analysis aligns quite well with our previous estimate that index funds represented 7.8% of non-money market mutual funds in the U.S. at the end of 2001 (see "How Big is the U.S. Indexing Market?" in our December, 2002 issue).

Given this picture of the underlying dynamics, it seems clear that when it comes to the continued popularity of actively managed funds relative to index products, lack of investor information is a more important obstacle than cognitive processing problems. As you can see, better information seems likely to raise the probability that at least 35% of investors will consider using index funds. Moreover, improving information may also indirectly act to reduce overconfidence in the remaining groups of non-index fund investors. Therefore, we will now turn to a closer examination of how we might overcome the information problem faced by many investors.

The first, and perhaps most important question to ask is whether or not this response should be left to market forces, or whether government involvement is justified. The latter requires that some type of "market failure" has occurred -- in other words, that significant costs or benefits exist that are adequately incorporated in market prices. We believe that this is indeed the case, and have written about this issue more than once (see "The Financial Scandal Nobody Wants to Talk About" in our November, 2002 issue, and "We Need More Prudent Experts" in our January, 2003 issue). And we are not alone in our view. The existence of government regulations regarding the presentation of performance data in mutual fund prospectuses confirms that the existence of some degree of market failure has already been accepted by the U.S. Securities and Exchange Commission.

This has led to the SEC's recent requirement that in mutual fund prospectuses, historical returns must be shown not only on a gross basis, but also net of sales loads, expenses and taxes. Recent regulatory changes also forced the disclosure of performance over periods

of time longer than one year. However, the survey data cited above suggests that these changes have not substantially improved investors' understanding of the critical differences between actively managed and index mutual funds. More changes are still needed. Here are some of the ones we'd like to see:

First, not only prospectuses, but also mutual fund advertising should be required to present returns after sales loads, expenses and taxes are taken into account. They should also be required to show returns over longer periods of time, as well as the returns on a comparable asset class index. Trading costs should also be disclosed in a manner that makes them comparable across funds.

Second, the current "health warning" on mutual fund advertisements ("past performance is no guarantee of future results") needs to be strengthened. The weight of evidence shows that good past performance is unlikely to persist in the future.

Third, the regulations governing defined contribution pension plans (e.g., 401k plans) should require that at least one index fund be offered in every asset class included in the plans' range of possible investments, and that the default allocation for plan participants is into these index funds. This would bring these plans into better alignment with the Thrift Savings Plan offered to all federal employees, which offers only index funds (see www.tsp.gov).

Fourth, to make information about the growing popularity of index investing more visible, the Investment Company Institute should be required to separately present data for index and actively managed mutual funds (today, it only breaks out data for exchange traded index funds).

Finally, given the potential future cost to taxpayers of investors' continued over-reliance on actively managed funds (see our November, 2002 article "The Financial Scandal Nobody Wants to Talk About"), the SEC should begin an advertising campaign to strengthen public awareness of the advantages of index funds and portfolio diversification across asset classes. This will not only help investors to make better

decisions in their pension plans, but also help them to better evaluate the recommendations they receive from their financial advisors.

Some may see this as an overly aggressive reform agenda. However, given the substantial improvement in investor welfare it could produce, it is one we should pursue with vigor, both in the United States and in all other countries where index products are available to investors.

Model Portfolio Results

| <i>These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)</i> | | | | | |
|--|---------------|------------------------|---------------|----------------------------|---|
| | Ticker | YTD 31Mar03 | Weight | Weighted Return | . |
| | | in Yen | | In Yen | |
| High Risk Portfolio | | | | | |
| <i>Suggested US Index Funds</i> | | | | | <i>Suggested Japanese Index Funds</i> |
| <i>Japan Benchmark</i> | | | | | |
| Japan Equity ETF | EWJ | -7.6% | 80% | -6.1% | iShares Topix; Daiwa Topix Index Trust |
| Japan Bond Index | JPM JPN | 0.7% | 20% | 0.1% | Nikko Japan Bond Index Trust |
| | | | 100% | -5.9% | |
| <i>Global Benchmark</i> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 40% | -1.2% | Nomura Global Stock Index Trust; Deutsche World Stock Index Trust |
| Vanguard Total International Market | VGTSX | -8.4% | 40% | -3.3% | Nomura Global Stock Index Trust; Deutsche World Stock Index Trust |
| Vanguard Total U.S. Bond Market Index | VBMFX | 0.8% | 10% | 0.1% | UFJ Parters Global Bond Index Trust |
| TRP International (Non US\$) Bond Fund | RPIBX | 2.7% | 10% | 0.3% | UFJ Parters Global Bond Index Trust |
| | | | 100% | -4.2% | |
| <i>Recommended</i> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 50% | -1.5% | Morgan Stanley S&P 500 Index Trust |
| Vanguard Europe | VEURX | -9.8% | 23% | -2.2% | Morgan Stanley Europe Index Trust |
| Japan Bond Index | JPM JPN | 0.7% | 7% | 0.0% | Nikko Japan Bond Index Trust |
| Vanguard Emerging Markets | VEIEX | -6.1% | 10% | -0.6% | UFJ Partners Worldwide Emerging Trust |
| Oppenheimer Real Asset Fund | QRABX | 5.3% | 10% | 0.5% | Nikko Power and Energy Trust |
| | | | 100% | -3.8% | |

| <i>These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)</i> | | | | | |
|--|---------------|------------------------|---------------|----------------------------|---|
| | <u>Ticker</u> | YTD 31Mar03 | Weight | Weighted Return | |
| | | in Yen | | In Yen | |
| Medium Risk Portfolio | | | | | |
| <i>Suggested US Index Funds</i> | | | | | <i>Suggested Japanese Index Funds</i> |
| <i>Japan Benchmark</i> | | | | | |
| Japan Equity ETF | EWJ | -7.6% | 60% | -4.5% | iShares Topix; Daiwa Topix Index Trust |
| Japan Bond Index | JPM JPN | 0.7% | 40% | 0.3% | Nikko Japan Bond Index Trust |
| | | | 100% | -4.3% | |
| <i>Global Benchmark</i> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 30% | -0.9% | Nomura Global Stock Index Trust; Deutsche World Stock Index Trust |
| Vanguard Total International Market | VGTSX | -8.4% | 30% | -2.5% | Nomura Global Stock Index Trust; Deutsche World Stock Index Trust |
| Vanguard Total U.S. Bond Market Index | VBMFX | 0.8% | 20% | 0.2% | UFJ Parters Global Bond Index Trust |
| TRP International (Non US\$) Bond Fund | RPIBX | 2.7% | 20% | 0.5% | UFJ Parters Global Bond Index Trust |
| | | | 100% | -2.7% | |
| <i>Recommended</i> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 50% | -1.5% | Morgan Stanley S&P 500 Index Trust |
| Vanguard Europe | VEURX | -9.8% | 17% | -1.7% | Morgan Stanley Europe Index Trust |
| Vanguard Emerging Markets | VEIEX | -6.1% | 5% | -0.3% | UFJ Partners Worldwide Emerging Trust |
| Japan Bond Index | JPM JPN | 0.7% | 18% | 0.1% | Nikko Japan Bond Index Trust |
| Oppenheimer Real Asset Fund | QRABX | 5.3% | 10% | 0.5% | Nikko Power and Energy Trust |
| | | | 100% | -2.8% | |

| <i>These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)</i> | | | | | |
|--|---------------|------------------------|--------|--------------------|---|
| | <u>Ticker</u> | YTD 31Mar03 | Weight | Weighted Return | |
| | | in Yen | | In Yen | |
| Low Risk Portfolio | | | | | |
| <u>Suggested US Index Funds</u> | | | | | <u>Suggested Japanese Index Funds</u> |
| <u>Japan Benchmark</u> | | | | | |
| Japan Equity ETF | EWJ | -7.6% | 20% | -1.5% | iShares Topix; Daiwa Topix Index Trust |
| Japan Bond Index | JPM JPN | 0.7% | 80% | 0.6% | Nikko Japan Bond Index Trust |
| | | | 100% | -0.9% | |
| <u>Global Benchmark</u> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 10% | -0.3% | Nomura Global Stock Index Trust; Deutsche World Stock Index Trust |
| Vanguard Total International Market | VGTSX | -8.4% | 10% | -0.8% | Nomura Global Stock Index Trust; Deutsche World Stock Index Trust |
| Vanguard Total U.S. Bond Market Index | VBMFX | 0.8% | 40% | 0.3% | UFJ Parters Global Bond Index Trust |
| TRP International (Non US\$) Bond Fund | RPIBX | 2.7% | 40% | 1.1% | UFJ Parters Global Bond Index Trust |
| | | | 100% | 0.3% | |
| <u>Recommended</u> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 24% | -0.7% | Morgan Stanley S&P 500 Index Trust |
| Vanguard Europe | VEURX | -9.8% | 14% | -1.4% | Morgan Stanley Europe Index Trust |
| Japan Bond Index | JPM JPN | 0.7% | 34% | 0.2% | Nikko Japan Bond Index Trust |
| Global Bond Index | Custom | 1.8% | 18% | 0.3% | UFJ Parters Global Bond Index Trust |
| Oppenheimer Real Asset Fund | QRABX | 5.3% | 10% | 0.5% | Nikko Power and Energy Trust |
| | | | 100% | -1.0% | |
| <i>Global Bond Index = 50% US\$ plus 50% Non-US\$ Bonds</i> | | | | | |

| <i>These portfolios seek to maximize the probability of achieving at least the target return over ten years, at the lowest possible risk.</i> | | | | | |
|---|---------------|------------------------------|--------|--------------------|---------------------------------------|
| | <u>Ticker</u> | YTD 31Mar03 | Weight | Weighted Return | |
| | | in Yen | | in Yen | |
| <u>Suggested US Index Funds</u> | | | | | <u>Suggested Japanese Index Funds</u> |
| 12% Target Return | | | | | |
| <u>Recommended</u> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 41% | -1.3% | Morgan Stanley S&P 500 Index Trust |
| Vanguard Europe | VEURX | -9.8% | 39% | -3.8% | Morgan Stanley Europe Index Trust |
| Vanguard Emerging Markets | VEIEX | -6.1% | 10% | -0.6% | UFJ Partners Worldwide Emerging Trust |
| Oppenheimer Real Asset Fund | QRABX | 5.3% | 10% | 0.5% | Nikko Power and Energy Trust |
| | | | 100% | -5.1% | |
| 10% Target Return | | | | | |
| <u>Recommended</u> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 40% | -1.2% | Morgan Stanley S&P 500 Index Trust |
| Vanguard Europe | VEURX | -9.8% | 28% | -2.7% | Morgan Stanley Europe Index Trust |
| Vanguard Emerging Markets | VEIEX | -6.1% | 10% | -0.6% | UFJ Partners Worldwide Emerging Trust |
| Oppenheimer Real Asset Fund | QRABX | 5.3% | 10% | 0.5% | Nikko Power and Energy Trust |
| Global Bond Index | Custom | 1.8% | 12% | 0.2% | UFJ Parters Global Bond Index Trust |
| | | | 100% | -3.8% | |

| <i>These portfolios seek to maximize the probability of achieving at least the target return over ten years, at the lowest possible risk.</i> | | | | | |
|---|---------------|------------------------|---------------|----------------------------|--|
| | <u>Ticker</u> | YTD 31Mar03 | Weight | Weighted Return | |
| | | in Yen | | in Yen | |
| <i><u>Suggested US Index Funds</u></i> | | | | | <i><u>Suggested Japanese Index Funds</u></i> |
| 8% Target Return | | | | | |
| <i><u>Recommended</u></i> | | | | | |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 40% | -1.2% | Morgan Stanley S&P 500 Index Trust |
| Vanguard Europe | VEURX | -9.8% | 33% | -3.2% | Morgan Stanley Europe Index Trust |
| Pacific Ex Japan ETF | EPP | 1.3% | 2% | 0.0% | Prudential Pacific Equity Fund |
| Vanguard Emerging Markets | VEIEX | -6.1% | 8% | -0.5% | UFJ Partners Worldwide Emerging Trust |
| Oppenheimer Real Asset Fund | QRABX | 5.3% | 10% | 0.5% | Nikko Power and Energy Trust |
| Japan Bond Index | JPM JPN | 0.7% | 4% | 0.0% | Nikko Japan Bond Index Trust |
| Global Bond Index | Custom | 1.8% | 3% | 0.1% | UFJ Parters Global Bond Index Trust |
| | | | 100% | -4.3% | |
| | | | | | |
| | | | | | |
| 6% Target Return | | | | | |
| <i><u>Recommended</u></i> | | | | | |
| Japan Equity ETF | EWJ | -7.6% | 3% | -0.2% | iShares Topix; Daiwa Topix Index Trust |
| US Equity Index (DJTMI ETF) | IYY | -3.1% | 31% | -0.9% | Morgan Stanley S&P 500 Index Trust |
| Vanguard Europe | VEURX | -9.8% | 11% | -1.1% | Morgan Stanley Europe Index Trust |
| Vanguard Emerging Markets | VEIEX | -6.1% | 9% | -0.5% | UFJ Partners Worldwide Emerging Trust |
| Japan Bond Index | JPM JPN | 0.7% | 46% | 0.3% | Nikko Japan Bond Index Trust |
| | | | 100% | -2.5% | |
| <i>Global Bond Index = 50% US\$ plus 50% Non-US\$ Bonds</i> | | | | | |