

The Index Investor

Why Pay More for Less?

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 August, this benchmark had returned (14.8%), while our model portfolio had returned (12.9%). For the sake of comparison, 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 August, it had returned (10.0%).

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 (9.8%), while our model portfolio had returned (7.6%), and the global benchmark had returned (4.6%).

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 0.1%, while our model portfolio had returned 1.3% and the global benchmark 6.2%.

The objective of our second set of model portfolios is to deliver less risk than their respective benchmarks, while delivering at least as much return. 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 last month, this benchmark had returned (14.8%), while our model portfolio had returned (11.1%). For the sake of comparison, 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 June, it had returned (10.0%).

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 (9.8%), while our model portfolio had returned (7.7%), and the global benchmark had returned (4.6%).

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 0.1%, while our model portfolio had returned 3.2% and the global benchmark 6.2%.

The objective of our third set of model portfolios is not to outperform a benchmark index, but rather to deliver a minimum level of compound annual return over a ten-year period. Thus far this year, our 12% target return portfolio has returned (11.3%), our 10% target return portfolio has returned (6.4%) our 8% target return portfolio has returned 2.9%, and our 6% target return portfolio has returned 6.5%.

Finally, on the active management front, our benchmark, the Fidelity Global Balanced Fund is down (3.9%) year to date, while our active model portfolio (which we initially kept in Vanguard Total Bond Market Index, but switched at the end of June to the Vanguard Inflation Protected Securities Fund) is up 8.73%.

Economic Outlook

More and more, it looks like the less favorable of our two possible economic scenarios for 2002 is becoming reality. The story can be summarized as follows. Over the past ten years or so, monetary expansion and productivity growth in the United States that were in excess of those in other parts of the world drove an apparently virtuous cycle. U.S. equity market returns were higher than those in foreign markets, which drew foreign investment into the United States. This not only provided additional support for rising

equity prices, but also drove up the value of the dollar versus other major currencies. Along with productivity improvements, the falling cost of imports helped hold down inflation, even as the economy experienced high rates of growth, sharp falls in unemployment, and a current account deficit that is expected to reach \$450 billion this year. Low interest rates and high equity returns effectively reduced the cost of capital for many companies, which led them to substantially expand their capital investment. Similarly, rising equity market values and rising housing values (linked to falling interest rates and rising consumer earnings) fueled strong increases in personal consumption spending. In the early part of 2000, this process began to reverse itself. The failure of many companies to achieve the expected rates of earnings growth that were implicit in their stock prices caused equity market values to collapse. In part, this failure was linked to a slowdown in business capital investment, as more and more companies realized they had expanded too quickly, and now faced excess capacity and the downward pressure on prices that it causes. Equity market values were then pushed further down by the 9/11 terrorist attacks and by revelations of earnings fraud at a number of leading American companies. In the face of these developments, only tax and interest rate cuts allowed consumers to keep spending and the U.S. economy to avoid a "double dip" recession.

Unfortunately, that game is about up. Consumer spending is coming under pressure from three directions. First, with continued weakness in business capital spending and earnings, consumers are becoming more worried about unemployment. Second, they have recognized that the damage done to their retirement savings by the equity market decline is not going to be quickly reversed. Finally, with interest rates at thirty year lows, they realize that they aren't likely to experience large refinancing gains in the future.

At the same time, foreign investors have stopped putting money into the U.S. at the rates they have in the past. The result has been a fall in the value of the dollar versus other currencies. So far, the decline has been relatively mild, because neither the Euro or the Yen currently seem particularly attractive alternatives. In the case of Japan, the Koizumi government has avoided the political difficulties of directly undertaking needed economic reforms, and instead chosen to let them happen indirectly as a result of continued

deflationary pressures. In Europe, domestic demand growth and equity market returns have been weak as many European governments have hesitated to undertake key economic reforms (e.g., in their labor markets) while the European Central Bank has kept interest rates relatively high to offset potential inflation caused by a weak currency and rigid labor market. In both cases, strong exports to the U.S. maintained economic growth (albeit at weak levels) and enabled these regions to avoid undertaking some needed structural reforms. If a weakening U.S. economy causes those exports to decline, then Europe and Japan could also slip into recession too.

Taken together, all these factors add up to a better than even chance that we are moving into a worldwide recession, with simultaneous slowdowns in the U.S., Europe, and Japan. In the short term, the development of this recession is likely to be accompanied by more and more instances of deflation -- that is, by falling prices. This is bad news for debtors (be they companies or consumers), but good news for people who have invested in bond funds with high credit ratings. It probably won't be good news for people who have invested in high yield debt or some mortgage funds, where the default rates are likely to be high.

In the medium term, however, we believe that the most likely scenario is a collective decision by the world's economic policymakers that, given a choice, inflation is politically preferable to deflation (would you rather have voters' homes rising or declining in value?). As a result, we see the most likely outcome of a nasty global recession to be global reflation. When this occurs, it will be good news for holders of inflation protected bonds, many properties, commodities, and, eventually, equities. The losers, of course, will be holders of fixed rate debt.

This is not a pretty picture. Nevertheless, we have to face up to what now seems to be happening around us. As they say, while we should hope for the best, we need to plan for the worst.

Equity Market Valuation Update

After a lackluster August, equity markets around the world still seem close to being fully, and in some cases, still over-valued. This analysis rests on two fundamental assumptions: that over the long term, labor productivity growth in our six major regions will converge at 3.5% per year, and that the long term real equity risk premium is 4% per year. Given those assumptions, here is our updated analysis at 30 August, 2002:

Country	Dividend Yield	Expected Real Growth Rate*	Expected Real Rate of Return on Equities	Real Risk Free Rate	Equity Risk Premium
Australia	3.6%	4.3%	7.9%	3.42%	4.0%
Canada	2.0%	4.1%	6.1%	3.39%	4.0%
Eurozone	3.1%	3.5%	6.6%	3.02%	4.0%
Japan	1.0%	3.2%	4.1%	2.47%	4.0%
U.K.	3.3%	3.5%	6.9%	2.20%	4.0%
U.S.A.	1.7%	4.4%	6.2%	2.08%	4.0%

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

Country	Implied Index Value	Current Index Value	Actual/Current
Australia	238.89	207.04	87%
Canada	124.49	204.78	165%
Eurozone	106.10	120.48	114%
Japan	25.82	84.42	327%
U.K.	321.99	263.45	82%
U.S.A.	379.42	374.96	99%

More Support For Indexing

Thankfully, the news this month isn't all bleak. To begin with, Vanguard released a study (based on data from Morningstar) comparing the performance of U.S. index funds versus actively managed funds across nine different style and size categories over the five years ended on 31 May, 2002. The following table shows two key pieces of information: the first number is the difference between average index fund and actively managed fund returns (positive numbers show the amount by which index funds outperformed active funds). The second number is the percent of active funds that were outperformed by index funds (e.g., 73% means that 73% of active funds were outperformed by index funds).

	Value Focus	Blended Focus	Growth Focus
Large Cap Focus	.08% and 51%	1.31% and 67%	1.31% and 57%
Medium Cap Focus	4.39% and 83%	6.97% and 90%	9.17% and 94%
Small Cap Focus	1.60% and 73%	.55% and 50%	(.48%) and 46%

As you can see, on average, index funds underperformed actively managed funds only in the small cap growth category. Even then, the amount of underperformance was quite small, and was probably offset by actively managed funds' higher sales loads, expenses, and taxes (see below). Equally interesting is the fact that the period covered by this data includes one of the worst bear markets in recent memory. As you might recall, when index funds were outperforming them during the bull market, active managers frequently predicted that they would outperform during a bear market, when they would use their superior skill to better time the market (e.g., by holding more cash when stock prices were declining). Based on the data presented above, you have to conclude that this prediction was wrong, and that index funds are a smart investment in bear markets as

well as in bull markets. As The Economist newspaper recently put it, "particular scorn has been poured on those poorly performing active managers who claimed that it was precisely during tough times that they would come into their own against index funds."

A study released last month by Lipper (a subsidiary of Reuters) provides further information about the causes of underperformance by actively managed funds. Over the five years ended on 31 December, 2001, the average diversified U.S. equity fund (a broad category which includes 80% of the assets invested in equity mutual funds) generated an average annual gross return of 10.47%. After deducting average annual expenses (1.54%), and making an adjustment for the sales loads charged on some of these funds (.34%), the average net return before taxes was reduced to 8.59%. Taking the average federal taxes paid (by investors in the highest, or 38.6% bracket) on dividend and capital gains distributions into account reduces average annual return by a further 2.31%, to only 6.28%. (Note that between 38% and 45% of all mutual fund assets are held in taxable accounts). In other words, investors in actively managed equity mutual funds that are held in taxable accounts give up, on average, 40% of their annual return to pay for expenses, sales loads, and taxes.

Using this framework, it is easy to see three sources of index funds' advantage: they usually don't charge sales loads, they have much lower expenses, and, because they trade less frequently and are more sensitive to tax effects, they also generate lower taxes than actively managed funds.

Persuasive as these data seem to us, there are still some leading financial publications which still don't seem to get the message (perhaps because they get so much advertising revenue from actively managed funds). A good example of this was a column in the 23 July, 2002 edition of The Wall Street Journal, on the subject of "investment rules that have been discredited by the falling market." One of the rules cited was "index funds are all you need." The Journal's argument is that "index investing doesn't take into account any company fundamentals", which it regards as "the very basis of successful investing." As proof of this dubious assertion, it claims that "active managers could choose not to

own overhyped [technology stocks], and therefore avoid the subsequent sharp decline." As further proof, it goes on to note that the ten best actively managed equity funds generated average annual (gross) returns of between 16.6% and 17.6% during the 20 years ended 30 June, 2002, compared to the 14.6% average return on the Vanguard 500 Index Fund. One struggles to decide where to begin attacking this argument, so many are the opportunities to do so. The data we have already presented have discredited the "active funds do better in bear markets" claim. And the Journal's focus on gross returns leaves out the critical impact of expenses, loads, and taxes. To give one more example of this, over the ten years ended 30 June, 2002, the Vanguard Total Stock Market Index Fund (VTSMX) delivered average annual gross returns of 10.87% per year, and 9.99% after expenses and taxes (at the 38.6% rate) are taken into account. During the same period, the average large cap blend fund (as classified by Morningstar) delivered average gross returns of 10.10% and average after tax returns of 7.74%. In other words, on an after tax basis, the Vanguard Total Market Index Fund outperformed by an average of 2.25% per year. After ten years investing in the index fund, you would have 25% more money than you would investing in the average actively managed fund; after 20 years, the difference grows to 56%. Finally, the Journal half-heartedly admits to another argument against its position when it notes that "the problem, of course, is that it can be very difficult to find consistently high performing, well managed funds."

Our President, Susan Miller, addressed this issue in her 15 August, 2002 letter that was published in the Financial Times. " I should like to add a couple of important points to "Bear Baits Active and Passive Managers" by Julie Earle and Florian Gimbel on the relative merits of active versus passive investment management."

"An investor who wished to purchase an actively managed fund whose future returns over the next ten years will be better than those of a comparable index fund faces must ask herself two questions. First, how likely is it that any active manager will possess the superior skill required to outperform an index fund over ten years? Second, what are the chances I will be able to identify these superior managers in advance?"

"With respect to the first question, one must distinguish between results due to luck, and those due to superior skill. A recent paper ("Can Mutual Fund Stars Really Pick Stocks?" by Kosowski, Timmerman, White and Wermers) analyzed this question, and found that over the 1962 to 1994 period, managers with superior skills accounted for only about five percent of their sample. And their analysis did not include the impact of sales loads and taxes, which are higher on actively managed funds than on index funds. Taking these into account would no doubt further reduce the proportion of superior active managers."

"With respect to the second question, the great majority of evidence suggests that superior past performance does not persist into the future, which makes it extremely difficult, if not impossible, to identify superior active managers in advance. For a good summary of this research, see "Past Imperfect", by Mark Rhodes, which was published as Occasional Paper Number Nine by the (UK) Financial Services Authority."

"In summary, the overwhelming majority of academic research suggests that an investor with a long-term time horizon should invest in index mutual and exchange traded funds."

Asset Classes Versus Tilts Within Them

A number of readers have written to us to ask about why, for example, we don't recommend value oriented index funds in our model portfolios. Based on the assumption that if someone has written us about an issue, a lot more people are thinking about it, we thought it would be helpful to address this issue again.

How you choose to allocate your investments between different types of assets (that is, between "asset classes") is the most important decision you make when it comes to determining whether or not over time you will earn the minimum rate of return you need to meet your goals. Unfortunately, this "asset allocation" decision is one that most people don't spend nearly enough time thinking about before they make it.

Given this, let's start with the basics. First, what is an asset class? To some extent, this is a theological question, on which experts can argue for hours without reaching agreement. For example, you may hear some people define "mid-cap U.S. value stocks" as an asset class, while someone else calls "European stocks" or "U.S. government bonds" an asset class. The basic concept of an asset class is relatively straightforward. An "asset class" is a group of securities of some type that have more in common with each other than they do with securities from outside the group. The rate of return on an asset class is measured by an index (see the Appendix for a brief primer on indexes and index funds). So far, so good. But how and where does one draw the lines? What does "have more in common with each other" mean in practice?

Here is how we've approached this question at The Index Investor. The basic purpose of dividing securities into asset classes is so that they (the asset classes) can be combined into portfolios that are "optimal." In this case, optimal means that there is not another combination of asset classes that is expected to generate a higher ratio of return to risk (for those of you who are familiar with modern portfolio theory, we're talking about the efficient frontier).

When you are calculating the expected return and risk of different portfolios (that is, different combination of asset classes whose weights sum to 100%), return is pretty easy to calculate: it is simply the weighted average of the expected returns of the different asset classes included in the portfolio. Calculating risk, however, isn't as easy. Why? Because the riskiness of an asset class depends not only on how variable its returns are relative to their historical average (that is, their standard deviation), but also on the extent and direction in which the asset class's returns vary with those of other asset classes (that is, their correlations). For example, an asset class with a relatively low rate of return might be a very good one to hold in a portfolio if those returns tended to go up when other asset classes' returns went down.

This brings us to the crux of the argument about what constitutes an asset class: the real question (in our eyes, at least), is where you draw the line on the maximum correlation of

returns you will accept between two “asset classes.” Consider the following correlations (of monthly returns from January, 1988 through December, 2000). Between the Russell 3000 (an index that measures the performance of the broad U.S. equity market) and the S&P 500, the correlation of returns was .99; with the S&P 400 (a mid-cap index) it was .92, and with the Russell 2000 (a small cap index) it was .78. However, the Russell 3000’s correlation with the Lehman Brothers Aggregate Bond Index (a broad measure of returns in the U.S. bond market) was only .38; with the MSCI Europe Index (which measures returns on European equities), it was .61, and with the MSCI Emerging Markets Index (emerging market equities) it was .55.

Given that the real power of diversifying your portfolio across asset classes comes from reducing risk as much as it does increasing returns, at The Index Investor we think it makes sense to define the asset classes used in our model portfolios broadly enough so that their returns have a relatively low degree of correlation with each other. So for our purposes, European, Emerging Markets, and U.S. Equities (represented by the Russell 3000) are asset classes, while the S&P 500 (a large cap U.S. equity tilt) or the Russell 2000/Value (a small cap/value U.S. equity tilt) are not. With respect to the advisability of taking different tilts within different asset classes, we cover these extensively in our book, *Why Pay More for Less?*, which subscribers can download for free from our website.

There is one final reason for our use of broadly defined asset classes in our portfolios. As we have described above, defining asset classes narrowly (for example, defining large capitalization and small capitalization U.S. equities as separate asset classes) results in very high levels of correlation between asset class returns. When these are used as inputs into our asset allocation models, the high correlations cause the results to be extremely sensitive to small changes in each asset classes' estimated risk and return. When this happens, small changes in expected returns often result in large changes in recommended asset class weights. Given that these risk and return estimates themselves are relatively uncertain (see the next article), using narrowly defined asset classes whose returns are highly correlated has a very good chance of producing unstable recommendations that,

wittingly or not, compound the effects of a number of weaknesses in the underlying models. In contrast, using broadly defined asset classes with lower correlations results in recommendations that remain constant despite small changes in estimated risk and return, and in so doing help to offset the uncertainties in the underlying asset allocation model.

Models Aren't Perfect for Many Reasons

We often note that the models upon which our recommended portfolios are based aren't perfect. This is true of the models employed by all financial services firms, not just the ones we use. Some of you have asked us to explain again why this is so.

The first potential weakness in the models has to do with the quality of the data we use in them. Our estimates of key information about each asset class (its expected risk, return, and correlation of returns with those of other asset classes) are based on information from a specific period of time in the past. Unfortunately, that sample may not accurately represent the entire set of historical data. This is particularly true of those asset classes where the reporting of transaction data is uneven at best -- for example, bond markets and emerging market equities. A closely related problem is that even if the sample accurately represents the historical distribution of returns, there is no guarantee that this distribution will continue to exist in the future. This is particularly true in situations where the markets underlying the asset class in question are undergoing permanent structural changes. A good example of this is emerging markets equities. Historical data usually are drawn from periods during which these markets were much less open to foreign investment, and therefore much less liquid than they are today. As a result, the historical volatility of returns (in so far as it is caused by imperfect information flows and low liquidity) may overestimate the volatility of returns in the future.

The second problem is that many of the models we use assume that asset class returns are normally distributed (that is, when plotted on a graph they form a "bell curve"). In fact, research has repeatedly shown that the returns distributions for many asset classes are skewed more to the left and have fatter tails than the normal distribution. This means that

negative returns and large returns (in either direction) are more likely than would be the case if the returns were normally distributed. So why do so many models assume normal distributions of returns? Because computationally, it is much, much easier, and produces results that are not too different from those produced by much more complex models.

The third problem is that most models assume no "serial correlation" between returns from one period to another. That is, they assume that one period's return has no influence on the next period's return. Once again, research has shown that this usually isn't true, although the effect is generally small. However, for computational efficiency, many financial models still assume no serial correlation between returns over time.

The fourth problem is that most models assume that volatility (that is, the standard distribution of an asset class's returns) and correlation (that is, the extent to which one asset class's returns vary with those of other asset classes) are stable over time. The fact is, they are not. While volatility is generally stable over time, it occasionally experiences sharp increases over a limited number of periods that are clustered together. Similarly, while correlations tend to be stable when markets are rising (which, over time, is the usual state of affairs). Once markets start falling, however, asset class returns tend to move together more than they usually do (that is, correlation tends to increase toward its upper limit of 1.0). Once again, it is possible to employ more complex models that take these effects into account. However, many analysts have questioned whether the additional benefits of doing this is worth the additional cost, particularly if other equally questionable assumptions remain unchanged.

On balance, the result of these weaknesses is usually an underestimation of the "true" level of risk associated with any asset allocation. As noted above, narrowly defining asset classes so that their returns are highly correlated only compounds this problem. At The Index Investor, we have taken a number of steps to offset the potential impact of these weaknesses. Overall, our actions are guided by the core belief "it is better to be approximately right than exactly wrong". First, as we have already discussed, we define our asset classes broadly, so that their returns have no more than a .60 correlation with

each other, and our asset allocation recommendations are relatively stable. Broad asset class definitions also help to minimize the potential impact of measurement errors. We also employ a number of techniques, particularly in our multi-period dynamic programming models (which are used to construct our target return portfolios) to take serial correlation and non-normal distributions into account. Finally, we are currently experimenting with additional changes to help us better incorporate clustered volatility and rising downside correlations into our analyses.

Using ETFs in Our Model Portfolios

The third important question we have been asked more than once is which exchange traded index funds (ETFs) can be substituted for the mutual funds we use in our model portfolios.

While not quite in the same league as "how many angels can dance on the head of a pin?", the question of whether to use exchange traded funds or mutual funds is getting close in terms of the heated arguments it tends to stir up. Let's start by briefly summarizing the arguments on both sides of this issue:

Exchange Traded Funds' supporters point to a number of this product's advantages:

- (1) Unlike mutual funds, ETFs are continuously priced throughout the trading day, whereas mutual fund sales take place at the end of the day price.
- (2) ETFs track a wider range of underlying indexes than index mutual funds.
- (3) Because they trade like a stock, you can employ a wider range of trading techniques with ETFs, such as stop loss and limit orders, and short sales. One would also expect to see futures and options become available on the more liquid ETFs (e.g., as has happened with QQQs, which track the NASDAQ index), which creates many more potential trading strategies.

(4) The operating expenses on many ETFs tend to be lower than on index mutual funds which track the same index, because ETFs don't provide the same level of service to their owners that mutual fund owners receive. Consider three index investment vehicles which track the S&P 500: the first two are ETFs: SPY's expense loading is .12% (that is, 12/100 of 1%), the IVV's is .09%. The biggest mutual fund which tracks this index is Vanguard's (VFINX), which has expenses of .18%.

(5) Finally, supporters claim ETFs are more tax efficient. A mutual fund is an open ended investment company. When you sell shares in an index mutual fund, you sell them back to the mutual fund company. If offsetting buyers aren't available, the number of outstanding mutual fund shares is reduced, and some underlying shares in the companies that make up the index being tracked will have to be sold by the fund to finance the outflow of cash caused by the net redemptions. This sale of the underlying company shares triggers capital gains distributions for all the owners of the index mutual fund. In comparison, an ETF trades on a stock exchange; when you dispose of your ETF shares, you are selling them to other buyers, not back to a mutual fund company. As a result, a sale of the ETF shares does not have the potential to trigger a sale of the underlying shares in the companies that make up the index being tracked. In this manner, the potential for unwanted capital gains arriving on your tax return is minimized. This is not to say that ETFs never make distributions. When the composition of the index they track changes (as recently happened with the S&P 500), the ETF trust has to sell and buy shares, and this can trigger capital gains distributions. ETFs also receive dividends on some of the shares they own, which they also distribute. For example, SPY paid the following dividends per share over the past two years (3/16/01, \$.32; 6/15/01, \$.35; 9/21/01, \$.37; 3/15/02, \$.33; 6/21/02, \$.35), while IVV paid similar amounts: (10/21/01, \$.39; 12/17/01, \$.34; 3/11/02, \$.29; 6/17/02, \$.37). Note that these historical dividend payments can be found on www.yahoo.com (the finance page). Click in the symbol (e.g., SPY), click "chart", and then at the bottom click "historical prices". You will then get a screen that allows you to find out the dividends that have been paid over whatever historical period you choose.

Supporters of index mutual funds often respond to these arguments with ones of their own:

(6) Operating expenses are only part of the story. When you buy an ETF, you also pay a brokerage commission, which you usually avoid when you buy an index mutual fund (which rarely carry sales loads).

(7) For people who dollar cost average -- investing an amount of money each month into the index fund or funds they own, the ability to avoid trading commissions makes mutual funds a much better deal over time (that is, the avoided sales commissions on ETF purchases more than offset the slightly higher operating expenses charged by the index mutual fund).

(8) If you are a long term, buy and hold investor (as many index fund investors tend to be), the ability to trade ETFs throughout the day, and to employ a wide range of trading strategies really isn't of much interest.

(9) Mutual fund companies provide a range of services (e.g., a knowledgeable person on the other end of an 800 number to answer your questions) that many discount brokerages do not (this assumes that, in order to minimize sales commissions, people buy ETFs through discount rather than full service stockbrokers).

As you can see, there are good arguments on both sides of this issue. On balance we are agnostic -- we have concluded that the right index vehicle to use really depends on an investor's individual circumstances, and not on one or two arguments that apply equally to everyone.

Having cleared the air on that issue (and avoided the extended arguments on the subject we have often encountered), let's move on to how you can use ETFs in our model portfolios.

Our model portfolios for investors whose functional currency is U.S. dollars currently use ten different asset classes. The following table shows those ten asset classes, along with the index mutual funds we have used in our model portfolios:

Asset Class	Index Mutual Fund (Ticker)
U.S. Bonds	Vanguard Total Bond Market (VBMFX)
High Yield U.S. Bonds	Vanguard High Yield Corporate (VWEHX)*
Inflation Protected U.S. Bonds	Vanguard Inflation Protected Securities (VIPSX)
Non-U.S. Dollar Bonds	T. Rowe Price International Bond (RPIBX)*
U.S. Real Estate Investment Trusts	Vanguard REIT (VGSIX)
Commodities	Oppenheimer Real Assets (QRACX)
U.S. Equities	Vanguard Total Stock Market (VTSMX)
European Equities	Vanguard Europe (VEURX)
Pacific Equities	Vanguard Pacific (VPACX)
Emerging Markets Equities	Vanguard Emerging Markets (VEIEX)

While technically not index funds, these funds very closely track the indexes against which their performance is measured.

In many cases, it is quite easy to substitute an ETF for the index mutual funds we use. In other cases, however, it is still difficult if not impossible to do so. Let's start with the easy ones first.

For U.S. equities, one could use IYY (the ticker for the ETF which tracks the Dow Jones Total Market Index), VTI (which tracks the Wilshire 5000 Index, like the VTSMX), or IWV (which tracks the Russell 300 Index). Returns on these ETFs tend to track each other very closely. On balance, we prefer the IYY, because of what we see as a superior methodology underlying the construction of its underlying index.

For U.S. bonds, there are four ETFs available today (they were just introduced in July). SHY tracks the Lehman Brothers 1-3 year Treasury Bond Index; IEF tracks the Lehman Brothers 7-10 year Treasury Bond Index, TLT tracks the Lehman Brothers 20+ year Treasury Bond Index, and LQD tracks the Goldman Sachs InvesTop Index (of 100 liquid, investment grade U.S. corporate bonds). In contrast, the Vanguard Total Bond Market Index Fund tracks the Lehman Brothers Aggregate Bond Market Index, which includes Treasury and investment grade corporate bonds, as well as mortgage and other asset backed securities. In terms of the risk/return trade-off presented by the ETFs, we prefer the intermediate term security, IEF. However, another iShares Fixed Income ETF has been registered, but not yet issued. With the tentative ticker symbol BFN, this one will track the Lehman Brothers Government/Credit Index, which is very similar to the Lehman Brothers Aggregate Bond Index. Once this ETF is introduced, it is the one we would prefer.

For U.S. Real Estate Investment Trusts, investors can choose between three ETFs. IYR tracks the Dow Jones U.S. Real Estate Index, ICF tracks the Cohen and Steers Realty Majors Index (the 30 largest REITS by market capitalization), and RWR tracks the Wilshire REIT index. On balance, we prefer the latter because of it includes a larger number of REITs; however, the difference in returns between these three ETFs is very small.

For European Equities, there is no ETF (so far) that directly tracks the MSCI European Index, which is what VEURX tracks. You can approximate it, however, with a mix comprised of 56% EZU (which tracks the MSCI Eurozone Index) and 44% EWU (which tracks the MSCI U.K. Index).

The situation is similar with respect to Pacific Equities. So far, unlike VPACX, there is no ETF which directly tracks the MSCI Pacific Index. One can approximate it, however, with a mix of 27% EPP (Asia Pacific Ex-Japan) and 73% EWJ (MSCI Japan).

On the other hand, if one simply wants to hold European and Pacific Equities in the same proportion that they are included in the MSCI Europe, Asia and Far East Index (EAFE), one can buy the EFA exchange traded fund.

With respect to emerging markets equities, one could try to approximate the MSCI Emerging Markets Index through a mix of different ETFs. However, in our opinion it is better to wait until Vanguard introduces its Emerging Markets ETF, which has already been registered with the Securities and Exchange Commission.

Commodities present a more difficult challenge, because the Oppenheimer Real Assets Fund (QRACX) is quite unique, as it is the only mutual fund in the United States that directly invests in physical commodities (via futures contracts) rather than in the companies that produce them. The Real Assets Fund tracks the Goldman Sachs Commodity Index. The relative weights of different commodities in this index were recently as follows: energy, 65%; metals, 9%; and agricultural products, 26%.

While there is no comparable ETF, the GSCI's heavy energy weighting suggests that a number of ETFs could be used as imperfect substitutes. XLE and IYE are quite similar; the former tracks the S&P U.S. energy companies index, while the latter tracks the Dow Jones U.S. energy companies index. IGE is somewhat broader, as it tracks the Goldman Sachs U.S. natural resources companies index, which includes forestry and paper, as well as energy companies, as well as companies that own agricultural plantations. The returns on all of these ETFs have relatively low correlations with other asset classes, but not as low as those of QRACX. Of the three ETFs, IGE is the newest, but, until recently, it had a higher correlation of returns with QRACX than the other two, energy focused ETFs.

However, in recent months, the fundamental difference between QRACX (which invests in the commodities) and IGE (which invests in companies producing them) has had a very large impact on their respective returns. Through the end of August, 2002, QRACX has returned 18.5% year to date, while IGE is down (11.6%). While some of this difference in returns is due to differing commodity weights, most of it is due to the fact

that IGE invests in equities (which have suffered as equity markets have declined) while QRACX invests in commodities, and has therefore not been affected by the decline in the U.S. equity market. In short, QRACX has delivered the diversification benefits one expects from investing in commodities, while IGE and the other ETFs have not.

Finally, there are still no ETFs that invest in the three remaining asset classes that are covered by our index mutual funds: non-U.S. dollar bonds, high yield U.S. corporate bonds, and U.S. inflation protected bonds. We hope that ETFs covering these asset classes will soon be launched; as of today, however, investors wishing to include them in their portfolios will have to use index mutual funds.

A Final Note

We apologize for the fact that this month's newsletter is appearing a couple of days late. Unfortunately, a number of us here at The Index Investor encountered difficult family situations in August as our relatives suffered serious health problems. One of them was my father. In his own way, he has always been an index investor. Long before Wells Fargo Bank introduced the first index fund almost thirty years ago, my father had stressed to us the many benefits of having a well diversified portfolio. Not the least of these was the fact that with a well diversified portfolio, he didn't spend much time trying to beat the market. He was perfectly content just to match it year after year, while putting his time to what he saw as more valuable and enjoyable uses. As a result, he is now a man without financial worries, and, more important, without regrets about what he hasn't had the time to do in his life. When all is said and done, I can't think of a better argument in favor of indexing.