

The Index Investor

Why Pay More for Less?

Model Portfolio Performance Update

The objective of our first set of model portfolios is to deliver returns that are superior to their respective benchmarks', while taking on no more risk. Our high risk benchmark portfolio is a combination of 80% equities (using the Dow Jones Total Market Index ETF), and 20% bonds (using the Vanguard Total Bond Market Index). It has returned (10.7%) year-to-date, while our model portfolio has returned (14.7%). The latter's performance has been hurt by the disappointing performance of European equities thus far this year, as well as weakness in commodities. Our medium risk benchmark portfolio is a combination of 60% equities and 40% bonds. Year-to-date, it has returned (7.3%), while our model portfolio has returned (11.6%). Again, European equities and commodities were the root causes of the underperformance. Our low risk benchmark portfolio is a combination of 20% equities and 80% bonds. Thus far this year it has returned (.3%), while our model portfolio has returned between (2.3%) and (3.4%), depending on the international bond fund used. In this case, it has been the surprising relative strength of the U.S. dollar (and the consequent weak performance of non-dollar bonds) that has caused our underperformance versus the benchmark portfolio.

The objective of our second set of model portfolios is to match the benchmark portfolios' returns while taking on less risk. Thus far this year, our model portfolios have underperformed their respective benchmarks, as the high, medium, and low risk portfolios have returned, respectively, (15.2%), (9.6%), and (2.4% to 3.5%).

Our third set of model portfolios are designed to maximize the probability of achieving minimum target returns of at least 12%, 10%, 8%, and 6%, while taking on as little risk

as possible. Year-to-date, they have respectively posted returns of (14.7%), (15.2%), (10.6%), and (6.5%).

Finally, as an experiment this year we have also developed an actively managed portfolio, with the twin objectives of (a) earning the highest returns possible, and (b) showing that active management is a less effective approach to doing this than straightforward passive indexing. More specifically, our active management approach is limited to changing the weighting we give to different asset classes at the beginning of each quarter; we are not picking specific stocks and bonds.

In addition to our other model portfolios, we have also benchmarked the performance of our active portfolio against the Vanguard Global Asset Allocation Fund (VHAAX), which is based on the same approach. Unfortunately, this fund was closed by Vanguard at the end of July, apparently because its approach wasn't too popular with investors. As a result, we are switching to a new benchmark, the Fidelity Global Balanced Fund (FGBLX) which uses the same approach. For the year-to-date, our active portfolio has returned (10.7%), while FGBLX has returned (9.2%).

Looking back at our active management decisions thus far (with hindsight always being clearer than foresight), our allocations to European and Pacific equities and to real assets didn't turn out as well as we'd expected. On the other hand, we didn't stick too long with a losing position. However, our decision to get out of non-U.S. dollar bonds is now causing us some anxiety, as the dollar (finally!) begins to fall against many other currencies. At our quarterly rebalancing next month, we may be moving back into this asset class. U.S. bonds have proven to be our best move this year. Like many active managers, we also thought the same might be said about our decision to stay in U.S. equities; however, with significant weaknesses now appearing in the all-important (for economic growth, corporate earnings, and market valuations) U.S. consumer spending indicators, it now looks as though the rally we thought we might see isn't going to materialize. As a result, we'll probably be reducing our exposure to U.S. equities next month.

Product and Strategy Notes

- Department of Good Timing: While we freely admit we here at The Index Investor had nothing to do with the timing of the announcement, we note that Barclays Global said this week that it plans to introduce ten new Exchange Traded Funds (iShares) based on global sector indexes. This fits right in with the series of articles we've written on the potential uses of sector funds. In the future, we'll compare the relative merits of domestic versus global sector funds.
- We also note that the rest of the world is finally coming around to the idea (long advocated here) that commodities are an asset class that offers substantial diversification benefits. Both S&P and Dow Jones have recently announced the launch of new commodities indexes, to compete with the Goldman Sachs Commodities Index (GSCI), which is tracked by the Oppenheimer Real Assets Fund which we use in some of our model portfolios. At some point, we expect ETFs to be issued that track the returns of the new index. However, as is always the case, you don't introduce a new index without doing something different from the folks who were ahead of you. In this case, S&P's index will be based on fewer commodities (17 versus 26 in the GSCI), which will be weighted differently.

The portfolio weights in the GSCI are based on each commodity's relative world production. In other words, when calculating the index, the physical quantities stay fixed, while the prices change; as a result, the relative value weights of different commodities in the index vary over time. For example, energy commodities weighting in the GSCI has recently increased quite a bit as their prices have risen relative to agricultural products and precious metals.

In contrast to Goldman's approach, S&P is holding the value weights of different commodities constant. The net impact of this should be that returns on the S&P commodities index should be less volatile than returns on the GSCI, but not able

to match either the GSCI's highs or lows. When more data on the S&P index becomes available, we'll compare it to the GSCI and report back to our subscribers. For now, however, our intuition says that while a lower volatility index may be more appealing to investors as a stand alone product, its potential diversification benefits in a portfolio should be less than those offered by the GSCI.

- Speaking of ETFs, Barclays announced yet another iShare recently, this time to track the MSCI EAFE (Europe, Asia, and Far East) index (ticker EFA). The expense load on the fund is 35 basis points (100ths of one percent). The closest competitor to this product is Vanguard's Developed Markets Index Fund (VDMIX), which also tracks the EAFE. The latter's expenses come to 32 basis points per year.
- Finally, from the Journal of Corporation Law comes a study that compared the advisory fees charged to individual investors in U.S. stock mutual funds with those charged to public employee pension funds. Where the former paid, on average, 56 basis points annually for advice (that's before other fees and sales loads), the latter paid only 28 basis points – for what was, for all intents and purposes, the same advice (actually, because the pension funds are bigger clients, they probably got more advice). And remember – well under half of those fund managers even managed to deliver returns that were better than the index (especially on a risk adjusted basis). Once again, the closer you look, the smarter it is to use index funds.

In Focus: Combining Sector and Country Tilts

In the last two issues of The Index Investor, we looked at the potential for using sector and country tilts (overweightings) to enhance the risk adjusted returns for a broad class of equities. In the case of the former, the broad market we examined was U.S. equities; in

the case of the latter, it was international equities, as defined by the EAFE plus Emerging Markets Index (which people can invest in via the Vanguard Total International Market Mutual Fund, VGTSX). Our examinations thus far suggest that both sector and country tilts have the potential to produce superior risk adjusted returns. Of course, this conclusions rests on the further assumption that history is a reasonable guide to the future, or, in other words, that the factors giving rise to these superior returns will operate in the future as they have in the past. However, when we tried to assess that question, we saw that there are some good reasons for believing that this may, in fact, be the case. For example, there is no evidence that investors' "home country bias" is disappearing.

Given that both sector and country tilts appear to be able to improve risk adjusted returns, this month we examine the obvious question: does it make sense to use them both at the same time?

We should start off by noting that this is a currently a very hot topic for both institutional investors and academic finance theorists. The reason for this, put simply, is that it is very difficult to sort out what is going on when you make sector and country tilts. Consider these two examples. Between January, 1994 and December, 2000, the correlation of returns between the U.S. equity market (as measured by the Dow Jones Total Market Index) and the Japanese equity market (as measured by the MSCI Japan Index) was .44. Was this low correlation due to fundamental differences between the countries themselves, or due to the different sector weightings within their respective equity markets:

Year End 2000 Sector Weights, by Market Capitalization

| <i>Sector</i> | <i>Japan</i> | <i>United States</i> |
|---------------|--------------|----------------------|
| Energy | 0.6% | 5.1% |
| Materials | 5.7% | 2.2% |

| <i>Sector</i> | <i>Japan</i> | <i>United States</i> |
|---------------------------|--------------|----------------------|
| Industrials | 16.9% | 10.6% |
| Consumer Cyclicals | 25.3% | 12.1% |
| Consumer Staples | 4.6% | 7.6% |
| Healthcare | 6.9% | 15.2% |
| Financials | 17.8% | 16.1% |
| Information Technology | 14.0% | 21.3% |
| Telecommuni cations | 4.6% | 6.1% |
| Utilities | 3.6% | 3.7% |
| Total | 100% | 100% |

Here's a second example. Between January, 1994 and December, 2000, the correlation between the world healthcare sector (as measured by the Dow Jones World Healthcare Sector Index) and the world consumer cyclicals sector (as measured by the DJW Consumer Cyclicals Index) was only .43. Was this due to fundamental differences between the economic forces driving risk and return in these two industry sectors, or was it due to their different country weightings: for example, 66% of the healthcare sector's total world market cap was located in the United States, while only 6% of it was located in Japan, while 21% of the world consumer cyclical sector's market cap was in Japan and 50% of it was in the United States?

As these examples demonstrate, to answer the question of whether, and to what extent one should combine sector and country tilts, one first needs to disentangle their effects from each other. Over the last few years, a number of studies have attempted to do just

this, using a variety of statistical methodologies. Unfortunately, they have differed in their geographic coverage (e.g., the world versus just the countries in the EMU), their industry definitions (some used broad sectors, while others used narrower definitions, and hence more industries), and the time frame covered by the study. The range of results for these studies ranged from country effects having 2.7 times the impact of sector effects to the two having effects that were equal to each other.

If there was a trend in these studies, it seemed to be that while the correlations between world industry sector returns have remained relatively constant, those between country returns have been increasing, as the integration of the world's markets for capital and for goods continues to grow. In relative terms, the potential benefits of diversifying across countries has declined in comparison to diversification across industry sectors. Nevertheless, the potential benefits of both approaches remain significant.

Armed with these research results, we then set about experimenting with how one could profitably put these insights into practice. Our first constraint was the range of sector, country, and regional index investments that are available to a retail investor. Today, Dow Jones U.S. Sector Indexes may be purchased in the form of iShares; however, there are, as yet, no funds that track global sector indexes. On the other hand, there is a good range of country and regional index funds and iShares available. So let's start with a quick review of some key facts about these investment alternatives.

We'll begin with the Dow Jones U.S. Sector Indexes, to which we've also added the NAREIT Index (which is tracked by the Vanguard's REIT Index Fund VGSIX). In the table below, we show two set's of returns correlation data, calculated over the January, 1994 to December, 2000 period. The first shows the correlation between the sector index and the overall U.S. equity market, as measured by the Dow Jones U.S. Total Market Index. The second shows the average correlation between each sector index and the other sector indexes.

| <i>Sector Index</i> | <i>Pct of U.S. Mkt Cap in Jan, 2001</i> | <i>Correlation with U.S. Market</i> | <i>Correlation with Other Sector Indexes</i> |
|------------------------|---|-------------------------------------|--|
| Basic Materials | 2% | .58 | .37 |
| Consumer Cyclicals | 11% | .85 | .46 |
| Consumer Staples | 8% | .72 | .43 |
| Energy | 6% | .52 | .34 |
| Financial Services | 18% | .76 | .48 |
| Healthcare | 14% | .57 | .33 |
| Industrials | 12% | .90 | .50 |
| Information Technology | 20% | .77 | .27 |
| Telecommunications | 5% | .64 | .32 |
| Utilities | 4% | .10 | .12 |
| REITs | N.A. | .27 | .22 |

The next table shows a range of non-U.S. indexes, along with the correlation of returns with the U.S. market as a whole. Moreover, we have also calculated the average correlation of the U.S. industry sector indexes with each of the international indexes.

| <i>Country Index</i> | <i>Correlation with U.S. Market</i> | <i>Average Correlation with U.S. Sectors</i> |
|----------------------|-------------------------------------|--|
| EMU | .65 | .42 |
| Australia | .59 | .37 |

| <i>Country Index</i> | <i>Correlation with U.S. Market</i> | <i>Average Correlation with U.S. Sectors</i> |
|----------------------|-------------------------------------|--|
| Canada | .80 | .47 |
| Japan | .44 | .23 |
| Switzerland | .56 | .39 |
| Sweden | .53 | .27 |
| U.K. | .67 | .44 |
| Hong Kong | .61 | .40 |
| Taiwan | .38 | .25 |
| South Korea | .29 | .15 |
| Mexico | .62 | .36 |
| Brazil | .25 | .14 |

Just by looking at the two tables, you can see that the sector and country correlations with the U.S. market are about equal, with some significant exceptions (e.g., Japan). Equally as interesting, the average correlation between the country indexes and U.S. sectors appears to be quite low, suggesting the existence of potential gains from diversifying across both countries and sectors.

Okay, now that we've set the scene, let's move on to our optimization experiments.

Our first task was to establish a benchmark against which to compare the results of our experiments. We chose the Dow Jones U.S. Total Market Index over the same January, 1994 to December, 2000 period covered by our data. Now, some people could

reasonably argue that , given that the universe of our potential investments covers both domestic sectors and foreign countries and regions, the appropriate benchmark would be a global equity index like the Morgan Stanley All Country World Index. We have a lot of empathy with that view; however, when you get right down to it, we think that most investors have a home country bias, and therefore use the domestic equity market as their primary benchmark. For this reason, we will do the same in this analysis.

Our challenge, then, is to improve on the results obtained by the DJUSTMI, which delivered average annual returns of 18.60% over the 1/94 through 12/00 period, with a standard deviation of 17.29%, or a very impressive 1.08% of return per unit of risk.

For our first optimization run, the only constraint we set was that a maximum of 15% of the portfolio could be invested in any single index. When we ran our optimization to match the 17.29% standard deviation of the benchmark portfolio, we ended up with a portfolio that delivered expected average annual returns of 28.54%, or a whopping 1.65% of return per unit of risk. The underlying asset allocation for this portfolio was as follows: 15% each to U.S. Energy, U.S. Healthcare, U.S. Technology, U.S. Utilities, and Sweden; 11% to Switzerland, 8% to Brazil, and 6% to U.S. REITs. By now the careful reader is saying, "wait a minute. The country indexes differ in terms of their underlying industry weightings. What is the overall industry mix in the optimized portfolio?"

Based on country index industry weightings at the end of 2000, here is the answer to this question:

| <i>Sector</i> | <i>Portfolio Weighting</i> | <i>U.S. Market Weighting</i> |
|---------------|----------------------------|------------------------------|
| Energy | 17% | 5% |
| Materials | 2% | 2% |
| Industrials | 4% | 11% |

| <i>Sector</i> | <i>Portfolio Weighting</i> | <i>U.S. Market Weighting</i> |
|------------------------|----------------------------|------------------------------|
| Consumer Cyclical | 2% | 12% |
| Consumer Staples | 3% | 8% |
| Healthcare | 19% | 15% |
| Financials | 15% | 16% |
| Information Technology | 21% | 21% |
| Telecommunications | 3% | 6% |
| Utilities | 16% | 4% |

After considering this result for a bit, we came back to a point we raised last month when we discussed country tilts. To wit, optimization is essentially a mechanical process, based on historical data, that is best used in combination with, rather than as a substitute for human judgement. One example of this was our decision to limit the investment in any single sector or country index to no more than 15% of the total portfolio, as a way of ensuring some minimal degree of diversification and thereby guarding against two risks: (1) that our data don't accurately represent what was really going on in the past and (b) that even if they are accurate, the future won't be exactly like the past.

With this in mind, we changed two rules for our next optimization. First, we substituted the Emerging Markets Index for Brazil, Mexico, Taiwan, Korea, and Malaysia Indexes. Second, we required that at least five percent of the portfolio be invested in both the Japan Index and the Emerging Markets Index. In the case of the former, our logic was that recent results unfairly penalize the country in an optimization, and don't accurately capture what we see as the future opportunity available there. In the case of the latter, we said that given the high individual country risks, we'd rather be in emerging markets generally rather than specific countries.

The result was broadly similar to our previous optimization run. This time we ended up with expected average annual returns of 24.79%, with a standard deviation of 17.29%, or a still very impressive 1.43% of return per unit of risk taken on. Again, we allocated 15% each to U.S. Energy, Healthcare, and Technology. In addition, we allocated 15% each to U.S. Financial Services, Sweden and Switzerland, as well as our minimum mandated 5% each to Japan and Emerging Markets. In terms of overall industry weightings, the results were as follows:

| <i>Sector</i> | <i>Portfolio Weighting</i> | <i>U.S. Market Weighting</i> |
|------------------------|----------------------------|------------------------------|
| Energy | 15% | 5% |
| Materials | 2% | 2% |
| Industrials | 5% | 11% |
| Consumer Cyclicals | 3% | 12% |
| Consumer Staples | 3% | 8% |
| Healthcare | 21% | 15% |
| Financials | 26% | 16% |
| Information Technology | 22% | 21% |
| Telecommunications | 2% | 6% |
| Utilities | 0% | 4% |

To further understand the forces driving the improvements in these expected risk adjusted returns, we conducted two further analyses. First, we looked at the correlations between the eight subasset classes used in the second portfolio, using data from the 1/94 to 12/00

period. Unsurprisingly, most of the correlations were quite low; in fact, the average correlation across the 28 separate pairs was only .375.

The second analysis took a closer look at the respective impacts of diversifying across industry sectors and across countries. We began by calculating the expected return and risk for a portfolio using just our industry weightings, based on historical data for the respective Dow Jones World Sector Indexes. This resulted in an expected average annual portfolio return of 18.75% with a standard deviation of 16.38%, or 1.145% of return per unit of risk. We then looked at the expected returns and risk for a portfolio that matched our country weightings of 60% U.S., 15% each to Sweden and Switzerland, and 5% each to Japan and emerging markets. This yielded an expected average annual portfolio return of 18.11% with a standard deviation of 16.59%, or 1.09% of return per unit of risk. Averaging the two results together yields a crude measure of 18.43% average return, with an expected standard deviation of 16.49%. It would thus appear that the interaction of country and sector diversification added a further 6.36% to expected returns, while adding only .80% to expected standard deviation.

Finally, we performed “the acid test”: we checked to see how our second model portfolio would have performed this year through the end of August. Unfortunately, its returns of (19.4%) have substantially lagged behind those for the Dow Jones U.S. Total Market Index, which was off only (14.2%) year-to-date. To put this in perspective, if you had put 50% of the equity portion of your portfolio in the Dow Jones U.S. Total Market Index iShare (IYY), and the other 50% in the Vanguard Total International Stock Market Index Fund (VGTSX), your year-to-date return would have been (15.8%).

What's going on? In a nutshell, the historical correlations haven't held up very well this year, with more sub-asset classes moving down together than one would have expected based on historical data from January, 1994 to December, 2000 (a period that did not see a worldwide economic slowdown like we have been experiencing this year).

This brings us full circle to where we started out last year, when we announced that we would be using much broader asset class definitions than we had in the past, and then looking at different tilts within those broad classes. The logic behind our move to broad asset class definitions was that in an era of rapid economic change, a lot of the historical assumptions about the way the economy works and the way different parts of it related to each other may not hold in the future. If this was the case, some of the historically valid approaches to enhancing risk-adjusted returns might also be undermined.

We thought then, as we still do, that the last relationships to be undermined would be those between broadly defined sets of asset classes. The analysis we have done and reported in this month's issue of *The Index Investor* would seem to further support this judgement. Clearly, based on historical data, we have shown that it is theoretically possible to substantially improve risk adjusted returns by making a combination of sector and country tilts within the broad equity asset class. However, as noted above, this year our theory doesn't seem to be holding up in practice, most likely because it is encountering economic conditions not covered by the historical data. As a result, an active management approach (sector and country tilts) has once again failed to deliver returns that are superior to those from straightforward broad indexing of broadly defined asset classes. And that may be the most important insight of all.