

The Index Investor

Why Pay More for Less?

Model Portfolios Performance Update

The performance of the U.S. equity market in March, 2000 brings to mind the words of an old Chinese curse: "may you live in interesting times." Through the end of February, the year to date return on the S&P 500 Index was negative 6.8%; by the end of March, this had rebounded to a positive year to date return of 2.2%. On the other hand, this gut wrenching performance does help to highlight the way that diversification across asset classes tends to reduce volatility without sacrificing much in the way of returns. On balance, diversification allows for a better night's sleep, and leaves one with energy to devote to more pleasurable pursuits than tracking the ups and downs of one's investment portfolio. Consider the performance of our model portfolios over the past two months:

Our risk based portfolios attempt to match the volatility of our benchmark portfolios while providing superior returns. Through March, that is exactly what they have been doing. Our high risk portfolio is up 6.3% year-to-date, versus 2.2% for its benchmark 80% S&P 500/20% Lehman Aggregate Bond Market portfolio. One month ago, our model high risk portfolio was up 4.9% on the year, versus a loss of 5.2% on the benchmark. No points for guessing who slept better over the last month. More specifically, over the past month our high risk portfolio has particularly benefited from sector rotation into mid-cap companies, the "rediscovery" of the joys of small cap value stocks, and the continued strong performance of the Oppenheimer Real Asset Fund, which, in line with our expectations, is delivering returns that are negatively correlated with the benchmark portfolio.

The story is much the same in our medium risk portfolio, whose returns are up 4.0% year-to-date, versus 2.3% for its 60% S&P 500/40% Aggregate Bond Market benchmark, and in our low risk portfolio, whose returns are up 4.1% versus 2.4% for its 20% S&P

500 /80% Aggregate Bond Market benchmark. Both of these portfolios have a recommended 9% weighting in international bonds, via the T. Rowe Price International Bond Fund. Year-to-date this fund is down 2.0%. Along with the real asset fund, this is an investment whose returns historically have had a very low correlation with those of other assets in the portfolios. Here is the scenario under which this asset class could deliver superior returns in the months ahead: a sharp drop in the U.S. equity market leads to a flight into U.S. bonds, which drives down U.S. interest rates relative to those available in Europe, which in turn causes a flow out of U.S. dollars and a depreciation of the exchange rate relative to the Euro and the British pound. While we aren't predicting that this is what will happen, we sleep well at night knowing we are prepared if this dark scenario does come to pass.

Our return based portfolios are structured to maximize the probability of achieving their respective target returns with the lowest possible degree of risk. They are designed for use by investors who have a very clear idea of the minimum annual returns they must earn on their portfolios to fully fund their future liabilities in light of their expected levels of future saving. Here again, the year-to-date results are encouraging: our 12% target portfolio is up 1.7% year to date; our 10% target portfolio is up 2.2%, our 8% target portfolio is up 2.4%, and our 6% target portfolio is up 1.8%. In the case of the latter, return has also been held back a bit by our recommended 12% holding of international bonds; however, as we noted above, one can easily see how this could change fairly dramatically later this year.

Options for Locking in Your Gains Now

What should you do if you are sitting on top of attractive gains on your S&P 500 investment, and you now think the market is overvalued?

On the one hand, there is an argument for not doing anything at all, beyond rebalancing your portfolio to ensure that its weights are in line with your target asset allocation. The logic behind this point of view is a body of research that says market timing is a very

difficult strategy to successfully employ on a consistent basis. Arguments based on this logic usually show how being out of the market for just a few key months during a five year period can substantially reduce a portfolio's rate of return. As far as they go, arguments of this type are correct -- the evidence suggests that over time, it is difficult to consistently earn returns above an index by "timing" a market.

However, arguments of this type should not be taken to imply that one can never successfully time a market. It is certainly possible that from time to time relative valuations (e.g., of bonds versus equities) will get so glaringly out of line that it makes sense to temporarily move beyond your target portfolio weights for each asset class. If you believe that this is the case today in the United States, then your next question is "what can I do about it?"

In the March and April Index Newsletters we will discuss four different ideas for action you could take.

The first option is to simply sell your S&P 500 index, and reinvest the proceeds in a bond market index fund. If you believe that a sharp drop in equity values would be accompanied by an equally sharp fall in interest rates (caused, perhaps, by the Federal Reserve pumping up the money supply after a crash to avoid a sharp downturn in the economy), then you would want to invest in a fund that tracked the return on long term bonds (e.g., the Vanguard Long Term Bond Index Fund). Such a fund would realize the biggest gain in value as rates fell. If you were unsure about the future course of interest rates, you might instead choose to invest in either a total bond market fund (e.g., the Vanguard Total Bond Market Index Fund) or an intermediate term fund (e.g., the Vanguard Intermediate Term Bond Index Fund).

There are two major considerations with respect to this option. The first is taxes. If your S&P investment is held in a tax-exempt (retirement) account, there is no tax impact. However, if it is held in a taxable account, and you have built up substantial gains, the tax impact could be substantial. The second consideration is missing out on future gains in

the S&P if you are wrong about the future direction of the market. If you switch to bonds, there is no way to capture them.

The second option is to purchase a put option on the S&P 500 Index. This puts a floor under the value of your investment in the S&P 500 while still giving you the chance to capture any further upside moves in the equity market. One of the best ways to implement this option is via the purchase of SPX LEAPS (Long-term Equity Anticipation Securities), which are long dated options on the S&P 500. SPX Index LEAPS are equal to 1/10 the value of the S&P 500. For example, a LEAP with a strike price of 150 is equal to an S&P index value of 1500. To make matters a bit confusing, the "multiplier" used to calculate the pricing of Index LEAPS is \$100. The best way to work through this is via an example.

Assume the S&P 500 index is currently at 1500, and your investment in an S&P 500 index fund is currently worth \$100,000. Assume you want to protect yourself against any loss below an S&P 500 index value of 1300. To do this, you need to purchase 8 LEAP index put contracts [$\$100,000 / (130 \times \$100)$]. Each of these LEAP contracts expires in December, 2002, and has a quoted price of $9 \frac{3}{8}$, which translates into \$937.50 per contract ($9 \frac{3}{8} \times \100). The all-in cost to hedge your \$100,000 portfolio against drops in the S&P 500 index between now and December, 2002 is therefore \$7,500 ($8 \times \937.50). In other words, you have paid an amount equal to 7.5% of your investment to purchase more than two and a half years of insurance on your equity investment.

What happens if the value of the S&P 500 has fallen to 1000 by December, 2001? The value of your equity investment has fallen by one third, to \$66,667. However, this loss has been partially offset by a \$30,000 increase in the value of your S&P LEAP puts [$(1300-1000) \times \$100$]. After taking the cost of the put into account, your net loss is only \$10,833 ($-\$33,333 + \$30,000 - \$7,500$). On the other hand, if the S&P 500 appreciates to 1800, the investor realizes the full upside, and is able to take a capital loss on the premium paid for the LEAPS.

Why don't more people take advantage of the opportunity to insure their portfolio by buying equity index puts? First, as you can see, the calculations can be a bit daunting. Second, many people may resist signing the additional forms that brokerages require before they allow you to trade options in your account. Third, LEAPS require an additional cash outlay, which some people may not be able to afford. Finally, if the LEAPS are held in a taxable account, they can be a bit complicated. Under Section 1256 of the Internal Revenue Code, they must be "marked to market" at the end of each year. Practically, this is the same thing as selling them at their fair market value at the end of each year and then instantly repurchasing them at the same price. Any resulting annual capital gain or loss on the LEAPS is automatically treated as 60 percent long term and 40 percent short term. In the April Index Newsletter we will discuss two other ideas for hedging your exposure in an overvalued market.

Is the Market Overvalued?

We are often asked whether or not we believe the U.S. equity market is overvalued. Our answer is a resounding "yes!" Here's why:

Between 1968 and 1998, the Price/Earnings ratio on the S&P 500 averaged 15.6x. Today it stands at 32.1x. Rather than just saying, "that's too high", let's look at some of the arguments that have been used to justify this lofty multiple. In other words, what would have to be true in order for this valuation to be fair or low.

One of the better arguments that we have seen is that earnings are understated because old accounting rules are no longer appropriate for the "new economy." More specifically, in the new economy, knowledge, brands and human capital ("talent") are much more important drivers of value creation than they have been in the past (arguable, but let's accept it as legitimate for now). However, even though these assets produce income across multiple time periods, many of the investments associated with them (for example, R+D spending, advertising, and training costs) are expensed in the year they are

incurred, rather than capitalized and depreciated over time (as one would do when spending cash on a machine or building). The net effect of this is a serious understatement of annual earnings. If this is true, the P/E ratio may not be too high after all.

On its face, this is a good argument. However, what it neglects is another aspect of the “new economy” that undoubtedly offsets some of the earnings understatement it claims is occurring. We refer, of course, to the substantial increase in the use of stock options in recent years to compensate some or all of a company’s employees. While the details are too technical to go into at length, the key point is that the full cost of issuing and exercising these options does not show up as an expense in a company’s profit and loss statement. As a result, the use of stock options in companies’ compensation plans has resulted a substantial overstatement of their earnings. One of the most popular examples of this argument is Microsoft, and an extensive discussion of the earnings impact can be found on [ADD URL].

Another argument that has been used to justify today’s high market P/E is that the many changes wrought by the “new economy” have fundamentally raised the rate at which the U.S. economy can grow without triggering inflation. In other words, if you look at the growth side of the equation, the P/E to growth (or PEG) ratio for the market is not overvalued (that is, it is less than 1.5 to 2.0). Rather, the current market P/E represents the opportunity “to buy growth at a reasonable price.” Okay, let’s test this.

First, let’s look at the growth of after tax business profits in the United States (as described in the 2000 Economic Report of the President (available at <http://www.gpo.gov>). Between 1959 and 1998, after tax business profits grew at a compound rate of 7.2% per year. But let’s be a bit more aggressive, and date the beginning of the new economy right about the time this long bull market began, in 1982. From 1982 to 1998, after tax business profits have grown by 9.5% per year. Now let’s use this rate to calculate a PEG ratio for the market as a whole, and let’s use Peter Lynch’s approach, and add the current dividend yield on the S&P 500 of 1.19% to the

growth rate. The equation looks like this: P/E Ratio divided by (growth rate plus dividend yield times 100), or $32.06/10.69$. The resulting PEG ratio is about 3.00, which is well into the overvalued range.

Ah, but some will say, remember that corporate profit numbers can be distorted by outmoded accounting rules. You really have to look at the impact of the “new economy” on overall economic growth. Fair enough; let’s have a go at that too.

In the long term, the nominal growth rate of output in an economy is driven by three factors: (1) the rate at which the population is growing (a proxy for labor force growth); (2) the rate at which real output per worker (labor productivity) is growing; and (3) the rate of inflation. Over the past ten years, the population of the United States has grown by about 1% per year. The growth of labor productivity is a more interesting story. Between 1900 and 1970, real output per hour grew at an average rate of 2.3% per year. The high point during this period was the 1950s, where it reached 3.0% per year. In the 1970s, growth in output per worker declined to 1.1% per year, and in the 1980s it improved only slightly to 1.3% per year. In the 1990s, things substantially improved: over the decade as a whole, output per worker grew by 2.01% annually, while in 1997, 1998, and 1999 it grew by respectively 2.2%, 2.8% and 3.0%. What then is a reasonable rate of future growth to assume for the economy as a whole?

Let’s be aggressive here, and assume population growth of 1% per year, labor productivity growth of 3% per year, and average inflation of 3.5% per year. This gives us an expected nominal growth rate of 7.5% per year. Now let’s add to that a dividend yield of 2% per (again, let’s be aggressive), and calculate our PEG ratio. Here’s what it looks like: $32.06/9.5 = 3.37$. Again, this suggests a very overvalued market. In fact, given the current P/E of 32.06, getting the PEG down to a “reasonable” value of 1.5 requires an expected earnings growth rate of about 20% per year. For individual stocks, this is undoubtedly achievable, at least for a period of time. For the market as a whole, however, it is not. Once again, the market appears overvalued.

Finally, let's take a look at one last valuation measure, the ratio of the rate of return on the 30 year Treasury Bond to the earnings yield on the S&P 500 (which is the inverse of the P/E ratio). Given today's long bond yield of 6.15%, and the 32.06 P/E on the S&P 500, we have bond/earnings yield ratio of 1.97x. Since 1984, this has averaged 1.4x. Again, another sign that the market is overvalued.

Does this analysis mean you should rush out and sell all your S&P 500 investments? No, it doesn't. A great deal of research (which we'll cover in a later issue) suggests that market timing is a very difficult game to win. The better approach, which we strongly advocate, is to (1) allocate your investments across a range of asset classes, (2) using low cost index funds, and (3) dollar cost averaging, and (4) regularly rebalance your investments to maintain your target portfolio weights. For example, a portfolio that contains a mix of U.S. equity, European equity, U.S. bond and Non-U.S. bond index funds will probably be down far less than a pure S&P 500 portfolio when the latter's valuation inevitably returns to normal levels.

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More Ways to Lock In Your Gains

In the March Index Newsletter we discussed two alternatives for hedging your exposure in an overvalued market. They included: a) the sale of your S&P 500 index and the reinvestment of proceeds in a bond market index fund and b) the purchase of a put option on the S&P 500 index. This month we will discuss two additional alternatives you may consider to hedge your financial exposure.

The third option is to buy a bond index fund and long dated call options on the S&P 500. This is very similar to a combination of the first two ideas. In this case, December 2002 LEAPS calls are currently priced at \$33 each. The investor could sell his current \$100,000 investment in the S&P 500 fund, and then invest \$78,000 of this in a bond index fund while using the remaining \$22,000 to buy seven 2002 LEAP call contracts with a strike price of 150. If the S&P moved up to 2200 over this period, the investor would realize a gross profit of \$49,000 on the LEAPS $[(220 - 150) \times \$100 \times 7]$, and a net profit of \$27,000 after deducting their original cost. The investor's total return would therefor be \$105,000 (\$78,000 plus \$27,000), not including any earnings on the bond index fund. If, on the other hand, the value of the S&P 500 declined to below 1500, the investor would be left with his \$78,000 investment in the bond index fund (and earnings thereon), plus a deductible loss on the premium paid for the call option.

The fourth option is to buy Merrill Lynch MITTS ("Market Index Target-Term Securities. MITTS are unsecured senior debt securities issued by Merrill Lynch whose rate of return is tied to the S&P 500. In a nutshell, at their maturity, Merrill pays the MITTS' owner an amount equal to (a) the face value of the security, which is \$10, plus (b) an amount equal to the difference between the S&P 500 on the date the security was issued and the date it matures, less an "adjustment factor" that compensates Merrill for the embedded index option. Let's look at an example to see how this works.

Again, assume the investor has \$100,000 currently invested in an S&P 500 index fund, or index shares (SPDRS). The most recent Merrill Lynch MITTS were issued in August, 1999 when the S&P 500 was at 1341.03. They mature in August of 2006. Upon maturity, Merrill will pay the holder a "supplemental amount" equal to the difference between the value of the S&P 500 on the issue date approximately 85.72 percent of its value on the maturity date (actually, the average of the value of the S&P 500 on the business days before the maturity date). These securities trade under the symbol MPF, and closed today at 9.5625. Assume our investor therefore purchases 10,458 shares for about \$100,000.

By the maturity date in 2006, assume the S&P 500 has risen to 2500. The amount used for calculating the "supplemental amount" is equal to 85.72 percent of this, or 2143. The supplemental payout is therefore equal to $[(2143-1341.030/1341.03) \times \$10]$ or \$5.98. The total amount the investor receives at maturity in 2006 in exchange for his initial investment of \$9.5625 in 2000 is therefore \$15.98 (\$10 + \$5.98). Given our investor's holding of 10,458 shares, he or she would receive \$167,118.84. Assuming a six year holding period, this works out to a compound rate of return of 8.935 percent per year. If the S&P500 is less than 1564.43 on the maturity date, the holder of the MITT will receive only the face amount of the security, or \$104,580.

If the MITTS are held in a taxable account, there are additional tax issues. Specifically, each year the investor will be required to pay ordinary income taxes based on the estimated yield on the securities, even though no cash is received from Merrill Lynch until the MITTS mature. In accordance with regulations issued by the Treasury

Department, Merrill Lynch has determined that the estimated yield to be used for calculating these tax payments is 7 percent per year.

In sum, the two big advantages of the Merrill MITTS are the very long term of the put option they offer; and the fact bundling these options with a debt security makes them very easy to use. Set against these advantages, however, are their potentially adverse tax consequences (i.e., realization of a capital gain at the time the original investment is sold in order to buy the MITTS, and annual taxation of implied returns), and possibly higher pricing for the option than an investor could obtain by buying a series of LEAPS over an equivalent holding period.

Our conclusion: If you are trying to protect an investment in a taxable account, LEAPS are clearly the best way to go. If the investment is in a tax-exempt account, with a longer term holding period, the MPF MITTS offer the opportunity to lock in a substantial portion of recent gains while retaining a good exposure to continued upside moves in the equity market.

Why Do Investors Get Surprised?

A great controversy rages today about the extent to which efficient markets theory accurately portrays the true nature of major financial markets. On the one hand, we have seen tremendous growth in the amount of investment flowing into low cost index funds. Logically, investors in these funds believe the market is basically efficient, and, apart from luck, there is no way to consistently earn above market returns. On the other hand, the majority of invested assets still are not indexed; investors owning these assets must believe that the market (or at least some sub-segment of it) is not efficient, and that it is possible to earn above market returns on their investments over the long term. As a starting point for understanding why investors get surprised, it is helpful to ask why “non-index” investors believe they will be

able to earn above market returns. Logically, these returns must come from some combination of three sources:

- Superior Information. Leaving aside the obvious case in which information is obtained illegally (i.e., insider trading), superior information comes from doing better fundamental research about an investment than other investors. The heavy investment by asset managers in both analysts and data collection is based on this approach.
- Superior Modeling. A second justification for above market long-term returns is the possession of a quantitative model that uses publicly available information to generate superior insights into the relative values of different investments. The heavy spending by investment banks and asset management firms into computer models based on neural networks, genetic algorithms, and complexity theory all represent efforts to realize above market returns in this manner (for a good example of this, see the prospectus for the Fidelity Disciplined Equity Fund).
- Exploitation of Irrational Investors. A third approach to earning above market returns is based on the assumption that the majority of investors make predictable errors when making investment decisions, and that these can be systematically exploited. A small number of academics (whose area of study is known as “behavioral finance”) and investment management firms (eg., Numeric Investors, LSV Asset Management, and RJF Asset Management) have focused their attentions in recent years on this approach. They believe the first two sources of above market returns are at best transitory: in an era of declining cost for communications and computing power,

information and modeling advantages are increasingly difficult to achieve, let alone sustain for long periods. On the other hand, investor irrationality appears very difficult to change, and is therefore the best source of long term above market returns. As evidence for their point of view, they cite a large number of “market anomalies” that seem to deviate from efficient markets theory, and persist for relatively long periods of time. For example, these include phenomena such as the “January effect”, “dogs of the Dow”, and the long-term excess returns earned in the past by “value” strategies.

What types of irrationality give rise to both surprises (for individuals) and above market returns (for those who exploit them)? At this point, behavioral finance theorists are far from agreeing on a single answer. However, a number of themes are emerging from their studies.

Perhaps the most important finding is that, contrary to efficient markets theory, investors vary widely in how quickly they adjust their valuation of an investment after new information about it becomes available. Why does this happen? The key suspects are a number of biases (that is, departures from pure rationality) that characterize most people’s thinking:

- Availability: people tend to estimate the probability of key value drivers (e.g., earnings growth and interest rates) based on a relatively small amount of recently available information, rather than a longer term data set. As a result, they put too much emphasis on recent information in forming their conclusions about the value of an investment.
- Anchoring: logically, people expecting to earn an above market return buy a stock because they believe its current price is less than

its true value. With this as their anchor, they insufficiently adjust their valuation of the investment to new information which may contradict this view (e.g., analysts reducing their earnings forecast, or an unexpected new product introduction by a competitor). The same heuristic applies to the stocks they don't buy: because they have anchored on the conclusion that price is equal to or greater than true value for these stocks, they will under-adjust to information that suggests this is not the case.

- Confirmation: People require much less information to form an initial impression than they do to change it later on. Moreover, once they have formed an initial impression, they will tend to collect information that supports it, and either not look for, discard, or undervalue information which contradicts it.
- Overconfidence: People tend to believe that the range of possible future outcomes for a given variable (eg., earnings growth or interest rates) is narrower than it really is.

In addition to these biases in their approach to estimating the value of investments, investors also tend to be less than rational in the way they make decisions about buying and selling them.

Prospect theory suggests that when confronted with choices about gains, people will tend to be risk averse in their decisions, while confronting them with choices about losses causes them to become risk seekers. In short, academic studies have now proven what any fan of country music has known for years: "losing hurts twice as much as winning feels good." In investment terms, this has serious implications. A study by Terrance Odean (Haas School of Business, University of California at Berkeley, Working Paper RPF-

269) analyzed trading records for 10,000 accounts at a leading discount brokerage firm, and found that the average investor sold his or her gains too soon, and held on to his or her losses too long, exactly as Prospect theory would predict.

Finally, one must also remember that the majority of funds invested in the equity market are managed not by individuals, but by various institutions (e.g., mutual funds, pension funds, and insurance companies). At this level, another layer of behavioral factors come into play: groupthink and conformity, both of which tend to inhibit conflict and discussion of diverging points of view. As such, these group factors probably work to reinforce the impact of the behavioral factors that affect the judgments and decisions of individual portfolio managers at these firms.

Moreover, the people managing these funds rightly fear that they will lose their jobs if their performance significantly trails the benchmark indexes against which it is compared. This can create a situation in which they are “forced” to invest in companies, sectors, or even asset classes even when they know they are overvalued. And when these investments are made, they often further drive up the price of the assets involved, creating further justification of the actions of other, “normally irrational” investors.

Taken together, the impact of all these behavioral and institutional factors suggest that investment markets are far more likely to be characterized by under and over reaction (and investor surprise) than by equilibrium and low volatility. In such markets, both momentum approaches (buy what’s going up) and value approaches (buy what is fundamentally undervalued) can make money, though at different points in time. However, once you move down from the asset class level (e.g., buying a large cap growth index fund) to the sector or company level, making money using either of these approaches

becomes far more difficult. Undoubtedly, there are some people in the world who are exceptionally good at it. Unfortunately, today many of these people are abandoning mutual funds for less regulated hedge funds where they can be more richly compensated for their skills. Given this, we continue to believe that the best way for a long-term individual investor to avoid unpleasant surprises is to invest in a range of asset classes through low cost index funds.