Retired Investor

Invest Wisely…Get an Impartial Second Opinion.

This Month's Feature Articles: Key Points

Our first feature article this month takes an in-depth look at the pros and cons of tilting your equity allocation toward small and microcap stocks. We review the evidence surrounding the controversies over whether the "small cap effect" actually exists, and assuming it does, what could be causing it. We then review the historical results realized by investors who took these tilts. Since a tilt toward small or microcaps implies a forecast that, on a risk adjusted basis, they will outperform the broad market index, we use standard active management concepts (alpha, tracking error, and the information ratio) to evaluate the results they have produced across a range of countries. We find that in only one case (UK microcaps) has this tilt produced an information ratio (which relates the average excess return earned from the tilt to the additional risk taken to earn it) that is statistically different from zero. However, microcaps suffer from an additional problem: highly illiquid markets limit the capacity of index funds to operate in this segment. On balance, after evaluating all the evidence, we conclude that it doesn't make sense to take small or microcap cap tilts.

This month's product and strategy notes look at four additional issues. First, we explore the concept of "active indexing", and find that even if you use index funds to implement them, active management decisions (e.g., small cap tilts) must still be based on superior forecasts that are beyond the capacity of most investors to make on a consistent basis. On balance, we still believe that investors are usually better off investing in broad asset class indexes. Our second note reviews a new analysis of the benefits of investing in commodities. We then review yet another scandal that is about to explode in the United States. This one involves the Security and Exchange Commission's examination of firms that advise pension funds on their asset allocation and investment selection while simultaneously earning large fees from the money management firms they are supposed to objectively evaluate. Our last note looks at four interesting new fixed income funds that have recently been launched.

This Month's Letter to the Editor

Have you quantitatively examined the trade-off between index mutual funds and index exchange traded funds?

Yes, we have. As you would expect, there are a number of variables at work. First, since the introduction of flat rate commissions (e.g., the rock-bottom $10.99 offer from Ameritrade), the size of the investment you are making matters. Second, the difference in expenses between the index mutual fund and ETF matters. Third, the holding period matters. Fourth, assuming both funds track the same index, tracking errors (the difference between the fund return and the index, after netting out expense differences) also matters. Finally, differences in taxes can be important if the account is held in a taxable account. Theoretically, tax treatment should favor the ETF, because at the margin it doesn't have to buy and sell portfolio securities to satisfy the liquidity needs of shareholders. Mutual funds are "open ended" investment companies that buy and sell their own shares from investors to provide liquidity, which sometimes (if net outflows are greater than net inflows) forces them to sell their underlying investment holdings. In contrast, ETFs are "closed end" investment companies, whose shareholders obtain liquidity by selling their fund shares directly to other investors in the stock market. Because its structure requires lower turnover in its investment holdings, the ETF should generate lower investor-level tax payments.

Because of the profusion of deep discount commission structures, we've approached the ETF versus mutual fund issue as a breakeven problem. Assuming no difference in tracking errors (which, as we note below, may not be a good assumption to make), and leaving the tax treatment aside (because in theory it favors the ETF), we calculate the present value of the expense savings, based on different holding periods. Since these savings are quite certain (i.e., the initial investment is known, as is the difference in expenses), we discount them at 3%, our estimate of the long term real risk free rate of return (we use real rates because we aren't including any inflation in our estimate of future expenses). If the present value of the future expense savings is less than the commission you would have to pay to purchase the ETF, you would be better off buying a no-load mutual fund that tracks the same index.

Here are three examples. First, let's assume a $1,000 initial investment, a 5 basis point (0.05%) difference in the expense ratios (in favor of the ETF), and a $10.99 commission at Ameritrade on the ETF purchase. Over all holding periods up to 20 years, you would be better off with the mutual fund (even at 20 years, the present value of the expense savings is only about $7). However, if the expense savings rise to 25 basis points, then you'd be better off with the ETF if you expected to hold it for six years or more. If the expense savings rise to 50 basis points per year, the ETF is a better deal if you expect to hold it for 3 years or more.

Next, let's increase the investment to $10,000. At 5 basis points expense ratio difference, you would prefer the ETF if you expected to hold it for three years or more. When the annual expense ratio difference rises to 15 basis points or more, you would prefer the ETF under all circumstances.

For a $100,000 investment, you always prefer the ETF. However, there are two other important points to keep in mind. First, we emphasize that this analysis only applies to a one-time investment. Obviously, if you are making regular investments over time (and incurring commissions on each purchase), you may well be better off with the index mutual fund.

Second, if the tracking errors were greater for the ETF than the mutual fund, this would reduce the relative attractiveness of the former, as it would effectively narrow, or even reverse, the difference in expense ratios. In the past, a number of ETFs have had larger than expected tracking errors; in fact, contrary to what theory would lead you to expect, some ETFs have had tracking errors that were larger than those at comparable mutual funds. There are many potential causes of tracking error. Obviously, the fact that an index fund charges expenses is one of them, but there are also two others that are important. The first is the time it takes for a fund to adjust to various actions that affect the companies in the index. These would include the addition or subtraction of a company from the index itself (e.g., due to a merger), and the reinvestment of any cash dividends received. Indexes are calculated as if these changes happen instantly. In the real world, they do not. The second big cause of tracking error is the approach taken by a fund to replicate the index it tracks. Unless you are a big fund, full replication (that is, purchasing all the shares contained in the index) can be cost prohibitive. Hence, many funds use some very complicated software to try to optimize the cost versus tracking error tradeoff. As you know, the inputs into any optimization model are

themselves only estimates, so sometimes the results end up being different from what you expected -- another cause of tracking error.

So, does the fact that some ETFs have had larger tracking errors in the past than comparable mutual funds invalidate our analysis? The best we can say is "perhaps." It may be the case that the people who manage ETFs can't or won't correct them. However, now that tracking errors have been identified as a problem, we think it is more likely that in the future they will shrink. In our experience, the prospect of looming unemployment usually provides a very effective incentive for managers to correct their past mistakes….

Global Asset Class Returns

YTD 30Jun04	In USD	In AUD	In CAD	In EURO	In JPY	In GBP
US Bonds	0.10%	7.22%	2.91%	3.14%	1.44%	-1.78%
US Prop.	5.10%	12.22%	7.91%	8.14%	6.44%	3.22%
US Equity	3.10%	10.22%	5.91%	6.14%	4.44%	1.22%
AUS Bonds	-9.92%	-2.80%	-7.10%	-6.87%	-8.57%	-11.79%
AUS Prop.	-2.99%	4.13%	-0.18%	0.05%	-1.65%	-4.87%
AUS Equity	0.40%	7.52%	3.21%	3.44%	1.74%	-1.48%
CAN Bonds	-2.64%	4.48%	0.17%	0.40%	-1.30%	-4.52%
CAN Prop.	-18.73%	-11.61%	-15.92%	-15.69%	-17.39%	-20.61%
CAN Equity	0.80%	7.92%	3.61%	3.84%	2.14%	-1.08%
Euro Bonds	-1.64%	5.48%	1.17%	1.40%	-0.30%	-3.52%
Euro Prop.	4.41%	11.52%	7.22%	7.45%	5.75%	2.53%
Euro Equity	2.40%	9.52%	5.21%	5.44%	3.74%	0.52%
Japan Bonds	-2.76%	4.36%	0.05%	0.28%	-1.42%	-4.64%
Japan Prop.	33.21%	40.33%	36.02%	36.25%	34.55%	31.33%
Japan Equity	10.20%	17.32%	13.01%	13.24%	11.54%	8.32%
UK Bonds	1.96%	9.08%	4.77%	5.00%	3.30%	0.08%
UK Prop.	33.99%	41.11%	36.80%	37.03%	35.33%	32.11%
UK Equity	3.70%	10.82%	6.51%	6.74%	5.04%	1.82%
World Bonds	-0.90%	6.22%	1.91%	2.14%	0.44%	-2.78%
World Prop.	8.81%	15.93%	11.62%	11.85%	10.15%	6.93%
World Equity	3.65%	10.77%	6.46%	6.69%	4.99%	1.77%
Commodities	7.90%	15.02%	10.71%	10.94%	9.24%	6.02%
Hedge Funds	0.39%	7.51%	3.20%	3.43%	1.73%	-1.49%
A$	-7.12%	0.00%	-4.31%	-4.07%	-5.78%	-8.99%
C$	-2.81%	4.31%	0.00%	0.23%	-1.47%	-4.69%
Euro	-3.04%	4.07%	-0.23%	0.00%	-1.70%	-4.92%
Yen	-1.34%	5.78%	1.47%	1.70%	0.00%	-3.22%
UK£	1.88%	8.99%	4.69%	4.92%	3.22%	0.00%
US$	0.00%	7.12%	2.81%	3.04%	1.34%	-1.88%

Equity and Bond Market Valuation Update

Our equity market valuation analysis rests on two fundamental assumptions. The first is that the long term real equity risk premium is 4.0% per year. The second is the average rate of productivity growth an economy will achieve in the future. As described in more detail on our website (see the green button labeled "domestic equity"), we use both high and a low productivity growth assumptions for each region. Given these assumptions, here is our updated market valuation analysis at the end of last month:

Country	Real Risk Free Rate Plus	Equity Risk Premium Equals	Required Real Return on Equities	Expected Real Growth Rate* plus	Dividend Yield Equals	Expected Real Equity Return**
Australia	3.32%	4.00%	7.32%	4.90%	3.53%	8.43%
Canada	2.37%	4.00%	6.37%	2.10%	1.88%	3.98%
Eurozone	2.08%	4.00%	6.08%	2.50%	2.60%	5.10%
Japan	1.08%	4.00%	5.08%	2.70%	0.90%	3.70%
U.K.	1.97%	4.00%	5.97%	2.50%	3.20%	5.70%
U.S.A.	2.06%	4.00%	6.06%	4.50%	1.60%	6.10%

**High Productivity Growth Scenario. See our website (green button labeled "domestic equity"), for assumptions used in both productivity growth scenarios for each region.*
*** When required real equity return is greater than expected real equity return, theoretical index value will be less than actual index value – i.e., the market will appear to be overvalued.*

Country	Implied Index Value*	Current Index Value	(Under) or Overvaluation in High Growth Scenario	(Under) or Overvaluation in Low Growth Scenario
Australia	145.87	100.00	-46%	-3%
Canada	44.03	100.00	56%	64%
Eurozone	72.63	100.00	27%	49%
Japan	39.47	100.00	61%	73%
U.K.	92.22	100.00	8%	36%
U.S.A.	102.56	100.00	-3%	38%

**High productivity growth scenario.*

At the suggestion of a number of readers, we have expanded our equity market valuation analysis. As we have described, our estimate of over or under-valuation is based on the relationship between the returns an equity market is expected to supply, and those investors are likely to demand. We define the former as the current dividend yield plus the expected rate of real long-term economic growth. To be sure, changes in the market price/dividend (or price/earnings) ratio also affect the returns supplied. However, we view these as being essentially driven by psychological factors which we have no basis for predicting. Hence, we do not include future price/dividend ratio changes in our analysis.

We define the future demand for equity market returns to be equal to the current yield on long term real return bonds, plus a four percent long term equity market risk premium. As you can see, the good news is that two of the factors in our model -- current dividend yields and the real bond return -- are easily obtained from the daily paper. The bad news is that the other two -- the expected rate of dividend growth and the "correct" equity market risk premium -- are two of the most contentious issues in finance. However, as a number of readers have pointed out, by assuming one of these, you can derive an estimate of the market's current expectation for the other. Specifically, the market's current implied rate of future dividend growth equals the current real bond yield plus the four percent equity market risk premium less the current dividend yield. Similarly, the market's current implied equity market risk premium equals the current dividend yield plus our estimated future growth rate less the current real bond yield. To further help our readers assess the relative valuation of different equity markets, we will be presenting this information each month, as shown in the following table:

	Current Dividend Yield	Current Real Bond Yield	Implied Future Real Growth Rate, Assuming 4% ERP	Implied ERP, Assuming Low Future Growth Scenario	Implied ERP, Assuming High Future Growth Scenario
Australia	3.53%	3.32%	3.79%	4.11%	5.11%
Canada	1.88%	2.37%	4.49%	0.61%	1.61%
Eurozone	2.60%	2.08%	3.48%	1.52%	3.02%
Japan	0.90%	1.08%	4.18%	1.62%	2.62%
United Kingdom	3.20%	1.97%	2.77%	2.23%	3.73%
United States	1.60%	2.06%	4.46%	3.04%	4.04%

We have also added a new bond market valuation update. It is based on the same supply and demand methodology we use for our equity market valuation update. In this case, the supply of future fixed income returns is equal to the current nominal yield on ten-year government bonds. The demand for future returns is equal to the current real bond yield plus the historical average inflation premium (the difference between nominal and real bond yields) between 1989 and 2003. To estimate of the degree of over or undervaluation for a bond market, we use the rate of return supplied and the rate of return demanded to calculate the present values of a ten year zero coupon government bond, and then compare them. If the rate supplied is higher than the rate demanded, the market will appear to be undervalued. This information is contained in the following table:

	Current Real Rate	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Rate Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
Australia	3.32%	2.96%	6.28%	5.91%	-0.37%	3.55%
Canada	2.37%	2.40%	4.77%	4.83%	0.06%	-0.57%
Eurozone	2.08%	2.37%	4.45%	4.32%	-0.13%	1.25%
Japan	1.08%	0.77%	1.85%	1.87%	0.02%	-0.20%
UK	1.97%	3.17%	5.14%	5.09%	-0.05%	0.48%
USA	2.06%	2.93%	4.99%	4.58%	-0.41%	3.99%

It is important to note that this analysis looks only at government bonds. The relative valuation of non-government bond markets is also affected by the extent to which their respective credit spreads (that is, the difference in yield between an investment grade or high yield corporate bond and the yield on a government bond of comparable maturity) are above or below their historical averages (with below average credit spreads indicating potential overvaluation).

Finally, for an investor contemplating the purchase of foreign bonds or equities, the expected future annual percentage change in the exchange rate is also important. Study after study has shown that there is no reliable way to forecast this. At best, you can make an estimate that is justified in theory, knowing that in practice it will not turn out to be accurate. That is what we have chosen to do here. Specifically, we have taken the difference between the yields on ten- year government bonds as our estimate of the likely future annual change in exchange rates between two regions. This information is summarized in the following table:

Annual Exchange Rate Changes Implied by Bond Market Yields

	To A$	To C$	To EU	To YEN	To GBP	To US$
From						
A$	0.00%	-1.08%	-1.59%	-4.04%	-0.82%	-1.33%
C$	1.08%	0.00%	-0.51%	-2.96%	0.26%	-0.25%
EU	1.59%	0.51%	0.00%	-2.45%	0.77%	0.26%
YEN	4.04%	2.96%	2.45%	0.00%	3.22%	2.71%
GBP	0.82%	-0.26%	-0.77%	-3.22%	0.00%	-0.51%
US$	1.33%	0.25%	-0.26%	-2.71%	0.51%	0.00%

Sector and Style Rotation Watch

A while back we published a table which described a number of classic style and sector rotation strategies that attempt to generate above index returns by correctly forecasting turning points in the economy. The basic logic is that you earn high returns by investing today in the styles and sectors that will perform best in the next stage of the economic cycle. We published the table to make an important point: there is nothing unique about the various rotation strategies we described, which are widely known by many investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Our larger point was, and is, that consistently getting this right is beyond the skills of most investors. In other words, most of us are better off getting our asset allocations right, and implementing them via index funds rather than trying to earn alpha by timing the ups and downs of different sub-segments of the U.S. equity and debt markets.

That being said, we continue to be surprised by the interest our table continues to generate (based on the number of emails we receive about it). For that reason, we will update it each month by including the year-to-date returns for funds which correspond to the different styles and sectors:

Classic Rotation Strategies

Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style	Growth (IWZ) **2.80%**	Value (IWW) **3.30%**	Value (IWW) **3.30%**	Growth (IWZ) **2.80%**
Size	Small (IWM) **6.50%**	Small (IWM) **6.50%**	Large (IWB) **2.60%**	Large (IWB) **2.60%**
Style and Size	Small Growth (DSG) **5.10%**	Small Value (DSV) **4.60%**	Large Value (ELV) **1.90%**	Large Growth (ELG) **2.30%**
Sectors	Cyclicals (IYC) **0.40%** Technology (IYW) **-0.60%**	Basic Materials (IYM) **-1.00%** Industrials (IYJ) **6.70%**	Energy (IYE) **13.20%** Staples (IYK) **8.60%**	Utilities (IDU) **2.10%** Financials (IYF) **2.00%**
Bond Mkt	High Risk (VWEHX) **0.90%**	Short Maturity (SHY) **-0.90%**	Low Risk (TIP) **1.80%**	Long Maturity (TLT) **-2.10%**

As you can see, the table tells the same, somewhat confusing story it did last month. The good news is that the results for sector and bond market rotation strategies are still broadly consistent, and indicate an expectation that that the economy is peaking, and interest rates will keep rising. The bad news is that the size and style rotation indicators are decidedly mixed, and would seem to indicate that the economy will continue to strengthen, and interest rates will fall. Either somebody has his or her forecast wrong, or something else is at work here. We vote for the latter. As we've said before, we have a great deal of respect for the bond markets, whose investors seem less prone to periods of self-delusion than their equity market counterparts. Bond investors' upside for being right (receiving the interest they are owed) is much smaller than their downside for being wrong (losing their principal). Hence, they tend to be a pretty clear thinking group. We think they have a clear view of the future course of the economy, while size and style returns in the equity market are being driven by momentum investors. A large number of research papers have explored momentum (that is,

the tendency of the price of a share that rose in the previous period to do so again in the next one too). Some of these have found that it is more often than not a small stock phenomenon, caused by rising demand for relatively illiquid shares. Others have found that it is related to the cash inflows experienced by mutual funds with superior short-term performance (e.g., they take in new money, and buy more of the shares that have been going up, driving them still higher). Since fund manager compensation is usually related to some combination of performance and total assets under management, you can see why this happens. Unfortunately (for the managers), the academic studies all agree that momentum eventually reverses.

Should You Tilt Toward Small Cap Equities?

Everybody has someone like Cousin Charlie in their life. He (or, more rarely, she) is the one who, in the middle of the party, likes nothing better than to boast of his investing prowess, while loudly sharing his market insights with everyone in earshot. Most recently, you've probably heard him talking about his "killing" in "small cap stocks." Unfortunately, claiming you're an index investor doesn't slow him down one bit. He simply points out, for example, that in 2003 the exchange traded fund that tracks the Russell 2000 (a small cap index) returned 46.2%, compared to only 28.8% by the Vanguard Viper ETF that tracks the broad Wilshire 5000 index. If he is in a particularly nasty mood, he might also point out that the Bridgeway Ultra Small Company Market Fund (which tracks so-called "microcap" stocks that in aggregate represent the smallest 10% of the total market capitalization of companies whose shares trade on the New York, American and NASDAQ Stock Exchanges) was up an astounding 79.4% in 2003. In short, "why aren't you putting your money in small caps?"

What can you say in response? Actually, quite a lot. As is usually the case, Charlie either isn't telling or does not know the full story. Let's start with a deceptively simple question: what determines the current fair value of a stock? Broadly speaking, four variables are at work. The first is the dividend the stock currently pays. Let's assume this equals $5 per share. The second is the rate at which these dividends are expected to grow in the future. To arrive at current value, we have to discount this stream of expected future dividends at a rate which reflects their riskiness compared to other investments. The third variable is the first

part of the discount rate -- the real rate of return on a risk-free government bond (for simplicity, we'll leave inflation out of this discussion for now). The fourth variable is the additional premium that you as an investor require above the return on government bonds to induce you to hold a risky equity investment. In theory, changes in these variables over time generate the annual returns you experience as an investor in a specific stock.

Over time, many researchers have tried to simplify this model still further, and identify a smaller number of "factors" that simultaneously affect the valuations of large numbers of stocks. A logical starting point for these efforts are economic factors that are widely available and theoretically easy to link to the basic stock valuation model. For example, in "Economic Forces and the Stock Market" by Chen, Roll, and Ross, the authors try to link future stock returns to industrial production, the spread between short and long term government bond rates (the "maturity premium"), and the spread between the rates on high and low credit quality corporate bonds (the "default premium"). These variables are thought to be proxies for expected changes in dividends and the expected dividend growth rate, as well as expected changes in the rate at which they are discounted (e.g., declining industrial production and an increasing maturity premium signal an oncoming recession and decline in cash flows, while rising maturity and default premiums signal increases in the required rate of return). Surprisingly, the results of this straightforward approach were mixed, with changes in economic variables unable to explain a substantial proportion of equity returns.

This led to an alternative approach to the problem, which used historical returns data to predict future stock returns. The earliest and most famous example of this methodology is the "Capital Asset Pricing Model" or CAPM. The theory behind this model is straightforward: since diversification eliminates the significance of company-specific risks (which offset each other in a large portfolio), the only risk factor that matters when forecasting future returns is the extent to which the return on a stock varies with the return on the overall market. This relationship is called the stock's "beta" (more specifically, beta is coefficient in a regression of the stock's returns on the market's returns). If a stock's beta is less than one, its return varies less than the return on the market, and if it is greater than one, it varies by more than the market. To determine the expected future return on a company's stock, you simply estimate the future return on the market (defined as the current risk free

government bond rate plus the appropriate equity market risk premium), and then multiply this times the stock's beta.

Unfortunately, the future returns forecast by the CAPM model didn't always turn out to be accurate (and gave rise to many journal articles on "the death of beta"). In their search for explanations for these "anomalies" (which, in economist speak, is anything you repeatedly encounter in reality that doesn't match the predictions of your model), researchers identified a number of systematic (that is, predictable) forecasting errors that occurred when using the CAPM approach. One of the earliest of these was "The Relationship Between Return and Market Value of Common Stocks" by Rolf Banz. This 1981 study popularized the "size effect", or the tendency of stocks with smaller market capitalizations to earn different returns than their betas would predict. Because most of these studies found these differential returns to be higher than those on large stocks, the size effect is often referred to as the "size premium".

In their seminal papers ("The Cross Section of Expected Stock Returns", "Common Risk Factors in the Returns on Stocks and Bonds", and "Size and Book-to-Market Factors in Earnings and Returns"), Eugene Fama and Kenneth French pulled these various ideas about anomalies together into a comprehensive approach. They showed how future returns on a stock could be more accurately predicted using not one, but rather three factors. Like the CAPM, the first of these factors was the expected return on the market as a whole. In addition to this, they identified factors that were based on the difference between the return on small capitalization stocks less the return on large capitalization stocks (known as SML), and the difference between stocks with high book/market ratios and low book/market ratios (known as HML). In a subsequent paper ("On the Persistence of Mutual Fund Performance"), Mark Carhart added a fourth factor: the return on recent winning stocks less the return on recent losing stocks (WML).

The net result of these efforts is an asset pricing model which (using more popular terms) claims that a stock's future return is a function of the return on the overall equity market, as well as a stock's relative exposure to three additional factors: size, value and momentum. For example, this four factor model predicts that a small stock with a high book to market ratio which has recently enjoyed attractive returns will earn higher returns in the

future than a large capitalization stock with a low book to market ratio whose recent returns have been poor.

As one might imagine, this model has provoked a great deal of debate. With respect to the size effect, three broad issues have been raised. First, does the size effect really exist, or does it simply reflect the misestimation of beta? Second, assuming it exists, what causes it? And finally, can an investor earn superior risk-adjusted returns from investing in small capitalization stocks rather than a broad market index?

Is the Size Effect Real?

Stated simply, the size effect claims that a firm's relative market capitalization has an impact on its expected returns beyond that forecast by its beta. At first, the evidence in favor of this conclusion appears to be overwhelming. The size effect has been found in many other countries and regions besides the United States.. A representative list of this evidence includes the following papers:

Country	Paper and Author(s)
Australia	"Size and Value Effects for Listed Property Trusts" by Rohit Kishore (also covers stocks)
Canada	"Evidence to Support the Four Factor Pricing Model from the Canadian Market" by L'Her, Masmoudi, and Suret
Emerging Markets	"Local Return Factors and Turnover in Emerging Stock Markets" by Geert Rouwenhorst
Australia, Canada, Germany, France, Japan, UK and US	"The Book to Market Effect in A General Asset Pricing Model: Evidence From Seven National Markets" by Maroney and Protopapadakis
Europe as a single market	"Value and Size Effect: Now You See It, Now You Don't" by Cormbez, Spienel, and van Holle (size premium only exists when stocks selected Europe wide, not at country-by-country level)
Europe	"The Role of Beta and Size in the Cross Section of European Stock Returns" by Heston, Rouwenhorst, and Wessels (In contrast to the previous paper, they find that the size effect is primarily found at the country level)
Japan	"Size and Book to Market Factors in Earnings and Stock Returns: Empirical Evidence From Japan" by Charitou and Constantinidis
China	"Firm Size, Book to Market Equity and Security Returns: Evidence from the Shanghai Stock Exchange" by Drew, Naughton, and Veeraraghavan
India	"Tests of the Fama and French Model in India" by Connor and Sehgal
Global	"Are the Fama and French Factors Global or Country Specific? by John Griffin (domestic models do a better job than those based on global factors)

However, a number of other papers have questioned the strength of this evidence. For example, in their paper "Estimates of Small Stock Betas are Much Too Low", Ibbotson, Kaplan and Peterson find that because they are traded less often, small stocks returns have a higher degree of autocorrelation than those of large stocks. Translated into English, this means that the relationship between a small stock's return in two successive periods is stronger than it is in the case of large stocks (which are effectively independent). Regressions that don't take this into account underestimate small stocks' betas. After this adjustment is made, the size effect shrinks, but doesn't completely disappear.

Along similar lines, in their paper "Equilibrium Cross-Section of Returns", Gomes, Kogan, and Zhang find that when beta is allowed to vary over time conditional on economic conditions, the size effect disappears, and beta alone is sufficient to predict future returns. The authors conclude that the strength of the size (and value) effects in models which don't allow beta to vary over time reflects these factors' correlation with the "true" conditional beta.

Other authors take a different approach, and look more closely at what actually causes the size effect to appear in the data. In their paper "On the Robustness of Size and Book to Market in Cross Sectional Regressions", Knez and Ready find that "the SMB disappears when the one percent most extreme observations are trimmed each month from the data set used by Fama and French." Similarly, in "Size and Book to Market Effects in Australian Share Markets", Halliwell, Heaney and Sawicki find that "small cap excess returns are the result of a small number of firms performing extremely well. In contrast, the typical (median) small firm has a lower rate of return than a typical large firm." A paper by Hsu and Chou ("Robust Measurement of Size and Book to Market Premia") uses U.S. data, and also finds that the size effect is due to a small number of firms performing extremely well. They conclude that in fact, "size has an asymmetric effect on returns. It is inverse for very small firms [i.e., small size indicating relatively higher returns], but positive for larger firms [i.e., beyond a certain point, returns actually increase with the size of the firm]." Finally, in "The Structural Characteristic Evidence on Risk Factors", Guidi and Davies note that their "evidence shows that the characteristics of newly listed and marginal firms are imbedded in and are important to the [SMB premium]. We find evidence that newly listed firms and marginal firms are the main characteristics that influence the S component in the SMB factor."

More generally, other authors have raised caution flags about the strength of the statistical tests that have been used to identify the size effect. Two good examples of these papers include "Tests of Multifactor Pricing Models, Volatility Bounds, and Portfolio Performance" by Wayne Ferson, and "Cross Sectional Determinants of Expected Returns" by Brennan, Chordia and Subrahmanyam.

On the issue of whether or not the size effect actually exists, perhaps we should leave the last word to some of the people who made it famous. In their paper "Characteristics, Covariances, and Average Returns: 1929-1997", Davis, Fama and French concluded that "the size premium is…weaker and less reliable than the value premium." This conclusion was confirmed by Dimson and Marsh, who compared the size effect in Germany, Japan, the UK and US between 1955 and 1999 (in their paper "UK Financial Market Returns 1955-2000"). They noted that "while all four equity markets have exhibited a positive size effect, this has been surprisingly modest (1.2% in Germany, 2.7% in Japan, 2.0% in the UK, and 1.0% in the US), given the prominence the small firm premium continues to receive in the literature."

Let's now move on to what might cause the size effect, assuming it exists.

What Causes the Size Effect?

Explanations of why a company's market capitalization is related to its future returns fall into three broad categories: behavioral explanations, risk-based explanations, and characteristic based explanations.

The behavioral explanation for the size effect is potentially very important, because if true, it suggests the possibility of earning higher returns while taking on less risk than one would by investing in a broad equity market index. In this argument, small companies receive less attention from investors than large companies. This is important, because investors dislike uncertainty and ambiguity, and these feelings are strengthened (making investors relatively more pessimistic) when less information is available. This leads investors in small cap companies to systematically underestimate their future growth and overestimate their risk, while making the opposite mistakes with respect to large cap companies. In other words, small cap companies are systematically undervalued (giving rise to higher returns), while

large cap companies are systematically overvalued (giving rise to lower returns). However, this theory also needs to explain why rational investors have not exploited the mistakes of the behaviorally challenged, and eliminated the size premium over time. In other words, a durable obstacles to arbitrage must exist. In this case, the thinly traded markets for small company shares could play this role, as they might expose arbitrageurs to substantial amounts of risk relative to their potential returns, and thus cause them to focus their energies on other markets (e.g., those for large stocks). An important implication of this behavioral explanation for the size effect would therefore seem to be that it should generate a relatively consistent positive premium -- that is, additional returns (alpha) for investors who tilt their portfolios towards small company stocks and away from the broad market index -- with relatively little additional risk (that is, a high information ratio). As we shall see, those predictions are not born out in recent data.

A much larger number of explanations view the size premium as the rational compensation an investor earns in an efficient market for bearing additional risk. The debate here is over the nature of this risk. One school of thought links the size effect to the statistical higher moments of stock returns. Let's look at some very interesting examples of this view. In his paper "The Pricing of Coskewness and Cokurtosis in International Size and Momentum Strategies", Daniel Hung looks at the returns on 44,290 stocks in 20 countries and finds that co-skewness (the tendency of the distribution of returns of two stocks to simultaneously be tilted in the same direction above or below their respective means) and co-kurtosis (the tendency of two stocks to simultaneously experience returns that are very far away from their long term averages) substantially explain the size effect. Chung, Johnson and Schill reach a very similar conclusion in their paper "Asset Pricing When Returns are Non-Normal." These conclusions clearly line up with the idea that risk is a multi-dimensional concept that goes well beyond the simple standard deviation of returns (that is, the dispersion of annual returns around their average) used in many asset allocation models. In particular, investors are (according to Kahneman and Tversky's Prospect Theory) approximately twice as concerned with avoiding losses as they are with maximizing gains. This means that downside risk measures are important to them. Statistically, skewness (the tendency of the median return to be either above or below the average return) and kurtosis (the tendency of returns to be significantly different from the average) provide such measures. Hence we should expect

them to be related to a stock (or, indeed, any asset's) expected return. Another paper ("Expected Options Returns") by Coval and Shumway takes this logic a step further, and shows that (a) the standard deviation of returns is not stable over time, but varies between regimes of low and high volatility; (b) stocks differ in the extent to which their standard deviations vary between these two states; (c) investors receive compensation for bearing this risk; and (d) in firms with small market capitalizations this risk is higher than average.

While these studies certainly provide us with interesting insights about the nature and pricing of different statistical risks, they do not answer the question of what actually causes one stock's skewness or kurtosis to be different from another's (or small stocks' to be different from large stocks'). From this perspective, the statistical measures are still proxies for the real economic risks that are driving returns.

This brings us to another line of research that has attempted to identify the economic risks that drive the small stock effect. In their paper "Can Book to Market, Size, and Momentum Be Risk Factors that Predict Economic Growth?", Liew and Vassalou answer their question affirmatively, based on an examination of returns in ten developed country equity markets. In general, high returns on Fama and French's SMB and HML factors precede growth in an economy. However, they caution that the size effect only "produces statistically significant returns in Canada, France, Japan, and the United States, and marginally significant returns in the UK. It does not appear to be profitable in countries whose markets are typically smaller, less liquid, and dominated by a few large capitalization stocks."

Another related economic explanation for the size effect is that it reflects a higher degree of default or financial distress risk on the part of firms with small market capitalizations (a risk that would only increase when economic growth slows). A simple quantitative example illustrates this view. Consider two firms, one with a book value of $100, and the other with a book value of $1,000. Both firms pay dividends equal to 5% of their book value. However, the smaller firm is expected to grow at 6% in the future, while the larger firm is expected to grow at only 4%. Assume the real rate of interest equals 3.0%, and the equity market risk premium equals 4.0%. The market value of the company is equal to the discounted present value of the expected future dividend stream. Mathematically, the formula is Dividend/(Real Rate + Equity Risk Premium - Expected Growth Rate). The company with

book value of $100 has a current market value of $500 [$5/(3% + 4% - 6%)]. The company with book value of $1,000 has a current market value of $1,667 [$50/(3% + 4% - 4%). Now consider what happens when the real interest rate increases to 4%. Assuming this increases the interest payments each company must make, while also reducing their sales (due to the economy slowing down), you could reasonably conclude that their risk of default or bankruptcy has also increased. However, as shown in the following table, the price of the smaller company's stock falls to $250, a loss of (50%), while the price of the larger company's stock falls to $1,250, a loss of only (25%). Why do we see this difference in returns between the small and the large company? This happens because the small company has a higher percentage of its starting value in the form of "growth options" that will only produce cash flows (e.g., dividends) in the future, while a higher proportion of the large company's value comes from cash flows that will be received in the near future. When the discount rate increases, growth options lose a greater percentage of their value than dividend cash flows.

Impact of a Discount Rate Increase

	Small Year 1	Large Year 1	Small Year 2	Large Year 2
Real Interest Rate	3.00%	3.00%	4.00%	4.00%
Equity Market Risk Premium	4.00%	4.00%	4.00%	4.00%
Cumulative Investment	$ 100	$ 1,000	$ 100	$ 1,000
Profit Rate (=Div)	5.0%	5.0%	5.0%	5.0%
Dividend	$ 5	$ 50	$ 5	$ 50
Expected Growth	6.0%	4.0%	6.0%	4.0%
Ending Market Value	$ 500	$ 1,667	$ 250	$ 1,250
Change in Market Value			-50%	-25%
Pct of Market Value from Dividends	14%	43%	25%	50%
Pct of Market Value from Growth Options	86%	57%	75%	50%

In their paper "Bad Beta, Good Beta", Campbell and Vuolteenaho take an interesting approach to this difference in the reaction of small and large cap companies to changes in the discount rate. They break down the traditional beta into two component parts: the sensitivity of a company's returns to changes in the discount rate, and their sensitivity to changes in the

expected dividend growth rate. They find that between 1963 and 2001, "small stocks have much higher discount rate betas than large stocks" and that this difference " is sufficient to explain most of the size premium."

Other papers have explored this issue from different perspectives. In "An Empirical Investigation of Risk and Return Under Capital Market Imperfections", Hahn and Lee find that "changes in the default and term spreads…contain most of the pricing implications of Fama and French's size (SMB) and book to market factors (HML)." In "Default Risk in Equity Returns", Vassalou and Xing compute default probabilities for individual firms and "find a strong size effect, but one that is only present in the 20% of the market with the highest default probability. These are typically the smallest of the small caps. There is no size effect in the remainder of the market." They conclude that the Fama French SMB and HML factors "contain some default related information, but this isn't the main reason they can explain the cross-section of equity returns…SMB and HML [also] appear to contain important priced information unrelated to default risk." Roberto Guitierrez, Jr. comes to the same conclusion, though by a wholly different route. In his paper "Book to Market Equity and Size in the Cross Section of Corporate Bond Returns," he notes that "since corporate bonds are priced in part according to default risk…size should be a determinant of the cross section of corporate bond returns if it captures distress risk." Indeed, Gutierrez does "find a strong size effect in bond returns; in fact, size is found to subsume book to market in bond returns." However, he also "finds that size is priced differently in the stock and bond markets. [This] finding that the reward for size is different across assets of the same firms suggests that it may be inappropriate to consider size as a sensitivity to a specific [default] risk factor."

Well if it is not solely default risk that is generating the small company effect, what else could it be? In their paper "Asset Pricing and the Bid-Ask Spread", Amihud and Mendelson suggest that firm size proxies for more illiquid markets and higher transaction costs. Under these conditions, an investor would have to earn a higher gross return on a small cap stock to end up with the same net return (after transaction costs) on a large cap stock. In a related paper ("Is There a Neglected Firm Effect?"), Beard and Sias reach a very similar conclusion. They find that because information about small capitalization companies is less available and/or more expensive to obtain, small cap stocks are harder to value, implying a

relatively higher risk that an investor will find himself on the losing end of a trade with someone who is better informed.

To guard against this risk, investors provide less liquidity (e.g., the maximum number of shares an investor will buy or sell at a given price), leading to higher transaction and market impact costs for small cap stocks. This view gains further support in the paper "Is Information Risk A Determinant of Asset Returns?" by Easley, Hvidkjaer, and O'Hara, who find that it is. Also, in a recent paper ("Hedging Against Liquidity Risk and Short Sale Constraints"), Avramov, Chao, and Chordia find that the combination of beta on the market portfolio and a liquidity risk factor does a better job of predicting future returns than the SMB + HML + WML model. Chen and Jindra provide further evidence on this point in their paper "A Valuation Study of Stock Market Seasonality and Firm Size." They find that "in a typical month, small cap stocks show the widest valuation dispersion, implying that they are the hardest to value." Moreover, "the valuation dispersions for all stocks [whatever their capitalization] widens at year end -- overvalued stocks become more so, and undervalued stocks become more so." The authors attribute this to two causes: end of the year "window dressing" by institutional investors to enhance their reported returns, and tax loss selling by individual investors. Both of these lead to the "January effect", or the tendency of stock prices to show a sharp rise during the first month of the year. The authors find that the January effect is particularly strong for small cap stocks.

The underlying causes of these valuation fluctuations are analyzed in "Prospect Theory and Institutional Investors" by O'Connell and Teo. In this paper, the authors tested the application of Prospect Theory to the group of investors who collectively account for the majority of trading volume in most financial markets. They found "no evidence whatsoever of disposition effects [the tendency to sell winners too soon, and hold losers for too long]; rather the dominant characteristic [of the investors they studied] was aggressive risk reduction in the wake of losses." The also found that this phenomena was related to time (or, more accurately, the nearness to year-end and the final performance numbers that would determine bonuses). "Fund managers were conditionally more risk-tolerant in the first half of the year. Gains during this period lead to incremental risk taking, but there was no evidence of this during the second half of the year. Correspondingly, losses in the first half of the year produced very little risk reduction: it was only in the second half of the year that managers

systematically cut risk following losses." Finally, they note that experience (learning) also plays an important role: "older, wiser funds did not take on more risk in the wake of gains, but cut risk more aggressively in the wake of losses."

The authors conclude that the modified version of prospect theory first proposed by Barberis, Huang, and Santos (in "Prospect Theory and Asset Prices") best explains the behavior they observed. According to this theory, rather than being a constant, an investor's degree of risk aversion changes in response to the evolution of gains and losses relative to some starting anchor value (reference point). As gains grow larger, an investor becomes less risk averse (i.e., he or she reduces his or her equity risk premium), which lowers their required rate of return and drives asset prices still higher. However, as losses grow, so too does risk aversion and the required rate of return, which further accelerates the decline in asset prices. In short, the model proposed by Barberis, et al, whose presence was tentatively confirmed by O'Connell and Teo, implies much more volatile asset prices (and returns) than would be the case if all investors were rational and only changed their valuation of an asset in response to new information about its future cash flows or a change in interest rates.

In the opinion of other authors, the fact that so much of the small cap return premium tends to be earned in January raises doubts about the extent is really represents compensation for risk. In their paper "The Cross Section of Common Stock Returns: A Review of the Evidence and Some New Findings," Hawawini and Keim ask "if the [small cap] premium is compensation for risk, is there reason to believe the market is systematically more risky in January than during the rest of the year? Second, if the size and book/market premia are compensation for additional risks that are priced in the context of an international asset pricing model under conditions of integrated international capital markets, then the premia should be correlated (that is, move together) across markets, in much the same way that the market risk premium is significantly correlated across markets. Inconsistent with this hypothesis, we find that the premia correlations are insignificant across the 17 international markets in our sample. If these premia are uncorrelated across international markets, is it reasonable to characterize them as compensation for risk?" On the other hand, in their paper "UK Financial Market Returns 1955-2000", Dimson and Marsh "find no evidence of a year-end size effect in the UK, regardless of whether we look at the calendar or the tax year-end."

A final stream of research into the causes of the size effect starts with the critical observation that it applies only to relative market capitalization, and not to other measures of a firm's size, such as sales revenue, book assets, or employees. Indeed, like other researchers, Jonathan Berk (in "An Empirical Re-Examination of the Relation Between Firm Size and Return") finds that "when the market value of the firm is controlled for, [there is] a positive relation between the non-market value size measures and average returns." He notes that "if two firms have the same expected cashflow [e.g., dividend], the one with the higher discount rate will have the lower market value. Consequently, according to this view expected returns will always be negatively correlated with firm market value." This leads Berk to conclude that "rather than evidence of a 'size effect', the relation might be due solely to the endogenous inverse relation between the market value and discount rate of firms."

Two subsequent papers elaborated on this critical insight. In "Optimal Investment, Growth Options, and Security Returns", Berk, Green and Naik hold a firm's expected dividends constant, and show how changes in its discount rate over time (due to both changes in interest rates and its decisions to make investments with varying degrees of risk) cause predictable changes in its returns, market capitalization and book-to-market ratio. In "Corporate Investment and Asset Price Dynamics", Carlson, Fisher and Giammarino hold the discount rate constant, and show how unpredictable shocks to demand for the firm's products lead to changes in its expected growth rate, and to the same changes in returns, market capitalization and book-to-market found by Berk, Green and Naik. Both of these papers present simplified models; in the real world, firms often face simultaneous changes in interest and growth rates. Indeed, the two are not independent; a rise in the interest rate tends to slow economic growth.

A simplified example may help to integrate the points made by these two papers. Consider a small firm that starts Year 1 with an equity investment of $100 (the firm uses no debt). Let's say this firm earns a profit of 5%, and pays it all out as a dividend (assume there are no taxes in this marvelous country). Investors expect these dividends to grow in the future by 4% per year. Finally, assume that the real rate of interest is 3%, the equity market risk premium is 4%, and investors charge the firm an extra .5% because it is judged riskier than the market as a whole (perhaps because it is small). As you can see in the next table, this results in a year-end market value of $143, and an ending book value/market value ratio of

.70. Investors' return on the initial $100 investment is 48% (a $5 dividend and a price change of $43). The next year, three things change. As the result of its initial success in the market for its product, the company's dividends are now expected to grow by 6% per year. As a result of these changes, the firm's market value rises to $333, its book/market ratio falls to .30, and investors earn a total return (dividend plus price change) of 137%.

In the third year, investors see the company as less risky, and reduce the equity risk premium they require from 4.5% to just 4%. This causes market value to rise to $500, book/market to fall to .20, and investors' total return to fall to a still not-too-shabby 51%. By the fourth year, competition has intensified, which has forced a cut in the company's expected growth to 4% per year. This causes a fall in market value to $167, a rise in book/market to .60, and a fall in investors' total return to (66%).

The Impact of Changes in Expected Growth and Perceived Risk

	Year 1	Year 2	Year 3	Year 4
Real Interest Rate	3.00%	3.00%	3.00%	3.00%
Equity Market Risk Premium	4.50%	4.50%	4.00%	4.00%
Cumulative Investment	$ 100	$ 100	$ 100	$ 100
Profit Rate (=Dividend Rate)	5.0%	5.0%	5.0%	5.0%
Dividend	$ 5	$ 5	$ 5	$ 5
Expected Growth Rate	4.0%	6.0%	6.0%	4.0%
Ending Market Value	$ 143	$ 333	$ 500	$ 167
Total Return (Dividend + PriceChange)	48%	137%	51%	(66%)
Book/Market Ratio	0.70	0.30	0.20	0.60

As you can see from this example, in four years our company has run the gamut from being a small value to a small growth to a large growth to a large value company, due to changes in the expected growth and perceived riskiness of its future dividends.

So, to sum up, despite the extensive amount of research that has been conducted, there is still substantial disagreement, not only about the existence of the size effect, but also about its underlying causes. Assuming it exists, all of the following appear to make some contribution to the size effect: (a) the natural evolution of firms' market values over the course of their lives; (b) small firms' higher sensitivity to changes in the discount rate, and

future rates of economic growth; (c) small firms' higher information risk, and the reduced liquidity and higher transaction costs this produces; (d) the behavior that results when the first three drivers interact with the preferences and incentives facing institutional and individual investors.

Let's now move on to our final question: can you improve your portfolio's risk adjusted returns by tilting your equity allocation to small cap shares?

Do Small Caps Produce Superior Risk Adjusted Returns?

To preview the story about to be told, in contrast to Cousin Charlie's assertions, the evidence on this point is not reassuring. Let's start by looking at historical small cap returns in the United States. Between January, 1979 (two years before Banz' article on the small cap effect was published) and December, 2003, the average annual nominal return on the Russell 2000 Index was 14.9% (annualized monthly data), with a standard deviation of 19.9%, skewness of negative .88 (that is, in a given month, the return was more likely to be below the average than above it), and a kurtosis of 3.17. In contrast, the average annual return on the broad Wilshire 5000 index during this period was 15.0%, with a standard deviation of 15.9%, skewness of negative .77 and kurtosis of 2.52. Translation: over this period, you would have earned about the same return by investing in the broad market instead of small caps, but with less risk.

Taking a tilt toward small caps is an active management decision that implies a forecast that the end result will be superior risk adjusted returns relative to the broad benchmark index. Like all active management decisions, we can calculate the alpha this produces (the annualized average of the monthly difference between the returns on the Russell 2000 and the Wilshire 5000). Over the January 1979 to December 2003 period, this alpha was negative: (0.1%). We can also calculate the Information Ratio, which relates the additional alpha you would have earned by taking the tilt to the additional risk you took to get it (the latter is called either tracking error", or the standard deviation of the monthly differences between the two index returns). In this case, the Information Ratio (alpha/tracking error) is equal to (0.1%)/9.92%, or basically zero. In other words, over this period an active management decision to invest in small cap stocks instead of the broad index would have added no value.

But, as we have noted in the past, the Russell 2000 Index only includes companies that are in (approximately) the 2nd to 8th percentile of market capitalization. What would have happened if you had instead invested in a micro capitalization index that invested in the bottom 10% of market capitalization? We estimate that over the January 1979 to December 2003 period, the average annual return to this strategy would have been 18.8%, with a standard deviation of 19.1%, a negative skew of (.94) and kurtosis of 3.81. While you would have earned a higher return than the Wilshire 5000, you also would have taken on more risk. Strictly in terms of return per unit of standard deviation, the microcap tilt would have produced a slightly better result than the Wilshire 5000 (0.98% of return per unit of risk versus 0.94%). However, this ignores the other aspects of risk; the microcap's skewness was more negative, and its kurtosis higher -- in other words, it had more potential than the Wilshire 5000 to produce big, unpleasant downside surprises in your portfolio.

Over the twenty five year period, your average alpha from the microcap tilt would have been 3.4%, with a tracking error of 10.6% and an Information Ratio of .32. Is this impressive? No. In fact, in order to determine if it is statistically different from zero (that is, to prove that it wasn't just due to luck), we'd need 36 years of data, and we only have 25.

Finally, this analysis assumes that you could easily invest in a microcap index. In point of fact, because microcap companies so small, and their shares so illiquid, microcap index funds are few and far between. We know of only two companies that offer them to individual investors: Bridgeway and DFA. However, the Bridgeway fund (BRSIX) is closed to new investors, while the growing size of the DFA fund in recent years has forced it to include exposure to somewhat larger companies. Last but not least, as index funds go, microcap funds are quite expensive to operate.

Findings on the money making potential of small cap tilts are not limited to the United States. In their paper "UK Financial Market Returns 1955 - 2000", Dimson and Marsh note that in both the UK and the US, the small and micro cap premiums were positive between 1955 and 1983, but negative between 1984 and 1999. As you can see in the following table, this results in Information Ratios that are unimpressive; only one (for UK microcaps) is statistically significant.

Information Ratios from Small and Microcap Tilts

Country	Micro Cap IR	Small Cap IR	Data Period
Germany	.29	.17	1955 - 1999
Japan	.03	.27	1971 - 1999
UK	.38*	.22	1955 - 1999
US	.10	.14	1955 - 1999

**statistically significant*
Source: Dimson and Marsh, "UK Financial Market Returns 1955 - 2000"

The authors note that theories that have sought to explain the size effect "have been misdirected in their focus on a premium. For [these theories] to have real value, they should also help us understand the reversal of the small cap premium in recent decades. This leads us to examine the underlying business performance of small relative to large companies. While fundamental performance can be measured in many ways, dividends provide the most direct measure of cash flows to shareholders…In 1955, the prospective dividend yield for the UK microcap index was 4.6% higher than for large cap companies. From 1955 to 1988, microcap dividends grew at an annualized rate that was 4.5% greater than for large caps. The stock market gradually recognized the higher growth rate of these securities, and their price/dividend multiple increased at an annualized rate of 3.4%. Over the 1955 - 1988 period, the microcap premium of 9.7% was thus supported by three fundamental factors: higher initial dividends, higher dividend growth, and an increasing multiple."

However, by 1988, "microcaps' dividend/price ratio was 1.6% less than large caps', and the following decade witnessed microcap dividends growing 2.0% per year less than large caps'…[As a result] between 1989 and 1999, the microcap premium was a negative (6.8%)." The authors go on to note that "the evidence for the United States over these two periods is remarkably similar" to what happened in the UK. They note, however, that their findings "replace one question with another. If we conclude that the stock market performance of smaller companies over the last decade reflects investor disappointment in smaller companies' fundamentals, the new puzzle that emerges is why the performance of small caps has been so

much worse than large caps over this period." In another aptly named paper, "Murphy's Law and Market Anomalies", Dimson and Marsh attempt to answer this question. They speculate that the underlying cause of the size premium's reversal was that investors incorrectly forecasted the importance of large size when it came to fully exploiting the potential benefits of new technologies, and to leveraging market power in increasingly globalized markets. In effect, small caps have underperformed because the expected growth of large cap companies' dividends was larger than expected. In other words, "rather than small-caps underperforming, perhaps we should think of large caps outperforming investors' expectations."

That being said, we still must confront the fact that in the United States small and especially microcap stocks recently have been substantially outperforming the broad equity market. A close look at the fundamental characteristics of different indexes help to understand what is probably going on. Let's begin with a brief description of the indexes we will use his analysis. The Wilshire 5000 is the broadest index for the U.S. equity market, covering all stocks listed on the New York, American and NASDAQ exchanges. The 750 stocks with the largest market capitalizations make up the Wilshire Large Cap Index. The 500 stocks with the next highest market caps are included in the Mid Cap Index, and those with the next 1,750 highest market caps make up the Small Cap Index. All remaining stocks included in the Wilshire 5000 make up the Microcap Index. At the end of May, 2004, the dividend yield (dividend/market value) for the Large Cap Index was 1.60%, compared to 0.82% for the Small Cap Index, and 0.49% for the Microcap Index. Higher current dividends clearly don't explain microcaps' recent spectacular performance.

That leaves four other suspects. Could it be interest rates? At the end of May, 2004, U.S. Government real return bonds yielded 2.41%. As we have shown in this article, a fall in interest rates can have a disproportionate impact on the market value of small and microcap stocks. Unfortunately, at the end of May, the great majority of investors were anticipating the Federal Reserve to raise interest rates. Well, then, perhaps the superior performance of small and microcap stocks was due to their having a lower equity risk premium than large caps. However, this would mean that investors require a lower rate of return to hold small and microcap stocks than large cap stocks, which in turn implies that the former are less risky than the latter. Clearly this isn't the case.

Our next suspect in this valuation mystery is the expected real growth rate of dividends. Given the current dividend yield on the index and the real bond return, by making an assumption about the correct equity risk premium we can infer the future dividend growth rate that is implicit in the current market value of the index. Mathematically, the formula for this is Expected Dividend Growth Rate = Real Bond Yield + Equity Risk Premium - Current Dividend Yield. For the sake of argument, let's make the unrealistic assumption that the required equity risk premium is the same for large, small and microcap stocks. If this premium equals four percent, the expected future real dividend growth rate is 4.82% per year for large cap stocks, 5.59% for small cap stocks, and 5.92% for microcap stocks. If the required equity risk premium is only 2.5%, the implied growth rates are 3.31% for large caps, 4.09% for small caps, and 4.42% for microcaps. To put this in perspective, our low scenario long term growth rate estimate for the U.S. economy is 3.5%, and the rate under our high (optimistic) scenario is 4.5% (which assumes continued strong growth in productivity).

The most optimistic interpretation of this analysis is that the microcap index looks like it is fully valued; a more realistic one is that it may be considerably overvalued. And this brings us to our last suspect: momentum. While the initial rise in small and microcap index returns may well have been caused by an anticipated fall in interest rates, their continuation in the presence of unfavorable fundamental factors suggests that they have been caused by investors buying small and microcap shares simply because they have risen in price. The relatively illiquid markets for small and microcap shares probably inhibits short selling, which further contributes to this momentum effect and the high index returns we observe. Finally, actual fund returns are likely lower than these index returns (perhaps by substantial amounts) because of the high transaction costs incurred when buying and selling small and microcap shares.

So let us conclude. Like all forms of active management, the success or failure of a tilt toward small or micro cap stocks comes down to the accuracy of your forecasts for their future risk adjusted returns versus those on the broad market index. As we have shown in this article, the theory and evidence that must necessarily serve as the basis for such a forecast are highly uncertain and occasionally contradictory. This makes accurate forecasting of future smallcap or microcap risk premia very difficult, if not impossible. Indeed, two recent papers, ("Predicting Stock Returns" by Avramov and Chordia and "On the Predictability of Stock

Returns in Real Time" by Cooper, Gutierrez, and Marcum) respectively conclude that "conditioning on firm size consistently delivers portfolios that underperform", and that "the current notion of predictability in the literature is exaggerated." In sum, based on the evidence we have reviewed in this article, we cannot recommend taking small and microcap tilts within the equities asset class.

Product and Strategy Notes

What is "Active Indexing?"

Tilting your portfolio toward small or microcap shares is one example of what some have called "active indexing." In essence, this confusing term (and apparent oxymoron) refers to an active management decision that is implemented through the use of an index that tracks a subset of a broad asset class. A comparison may help make this clear. A typical active manager makes many decisions each year -- forecasting the future returns on individual securities, ranking them on different criteria, and combining them into portfolios. In contrast, an "active indexer" makes only one decision each year: whether to invest in an index based on a tilt, or in the broad asset class index.

The expected payoff from active management is called "alpha", and is defined as the difference in returns between the tilted portfolio and the broad asset class index. In theory, alpha is a function of two variables: the active manager's forecasting skill, and the number of times it is applied. Given the difference in the number of decisions made, given equal forecasting skill a true active management approach, which involves many more decisions (also known as the "breadth" of the strategy) should generate higher alpha than an index tilt. Looked at another way, in order to generate the same alpha, the forecasting skill of the manager taking an index tilt would have to be much better than that of an active manager pursuing a broader strategy.

The other side of the additional expected returns from active management decisions is the additional risk that must be taken to earn them. One widely used measure of this incremental risk is called "tracking error," which is defined as the standard deviation of the alphas earned over some period. Finally, to compare alternative approaches to active

management, their potential returns must be related to their potential risks. The standard way to do this is to divide the strategy's expected annual alpha by its expected annual tracking error. This produces what is known as the "Information Ratio" (for more on these concepts, see the green button on our home page, "The Case for Active Management"). A key problem you encounter when comparing active management strategies is deciding whether an Information Ratio reflects a manager's skill or just plain luck. In statistics, the "T-Statistic" is usually used to decide this question. A t-statistic greater than 2.0 means that there is a 95% probability that the result you are examining is different from zero -- in other words, that it reflects some skill and not just luck. The lower the information ratio, the more years of data you need to obtain a T-Statistic greater than 2.0. The intuition here is that the more risk (tracking error) a manger takes to achieve a given level of alpha, the harder it will be to separate skill from luck.

In this month's feature article, we examined the Information Ratios produced by tilts towards small and microcap stocks, in comparison with the broad equity market index. We found that, with only one exception (microcaps in the UK), the T-Statistics for these strategies in different countries were all less than 2.0. In other words, there was no statistical evidence that would make you confident that these tilts would generate positive alpha in the future -- that is, additional returns above what you would earn by investing in the broad market index. In the absence of this type of inductive evidence, the best you can do is base a decision to use an index tilt (or any form of active management) on a theory that shows why this approach should produce positive alphas in the future (even though it hasn't produced statistically significant alphas in the past).

But what about other index tilts? Have they produced statistically significant alphas in the past? The following table is based on 25 years of data, covering 1975-1999. It shows the Information Ratios for Value and Growth Tilts in a range of markets.

Information Ratios for Value and Growth Index Tilts

	Australia	Canada	Europe	Japan	UK	US
Value	.31	(.06)	.14	.39	.23	(.05)
Growth	(.29)	.03	(.25)	(.37)	(.24)	.04

As you might guess, none of these Information Ratios are statistically different from zero (although some of them are close). However, there is an important criticism that can be leveled at this data. There are many different approaches to defining growth and value indices. The ones we have used simply divided the broad market index into two equal halves, based on companies' ratio of book value to market value. Companies with relatively high book/market are in the value index, and those with relatively low book/market are in the growth index. The problem, of course, is that while the difference between companies at the ends of the distribution are quite large, the difference between the companies in the middle are quite small. There is a good argument that this makes indexes constructed in this manner much less useful as a means of realizing what theory suggests should be higher returns from investing in value stocks. A better approach (e.g., the one taken by DowJones Indexes) leaves out many of those companies in the middle of the price/book distribution. The resulting indexes should do a better job of capturing the theoretical value premium. In an upcoming article, we'll analyze the results produced by tilts using these indices, as well as their statistical significance.

By now, the underlying concepts behind "active indexing" should be clear. Based on a theory of the factors that should generate alpha, create a set of rules that enable you to divide the companies in the broad market index into a number of sub-indexes. Then create a product (e.g., a mutual or exchange traded fund) that tracks this index and market it (and the alpha theory) to investors. Over time, you (the sponsor of the fund) earn management fees, and (hopefully) the fund investors earn positive alpha.

In addition to size and value/growth based index funds, investors' interest in active indexing has also led to the creation of index funds that combine these two approaches (e.g., small cap value; large cap growth), index funds that track industry sectors (e.g., consumer staples, financial services, utilities, etc.), as well as even more narrowly defined "indexes"

(e.g., the iShares Dow Jones Select Dividend Index Fund, that tracks the 50 shares within the Dow Jones Total Market Index that have the highest dividend yields).

Taken to its logical conclusion, this approach leads to products like the PowerShares Dynamic Market Portfolio (ticker PWC). This fund tracks something called the "Dynamic Market Intellidex Index." In essence, this index is constructed by consistently applying a series of complicated rules that are intended to identify shares that collectively will deliver higher returns that the S&P 500 Index. Conceptually, the only difference between PWC and an actively managed quantitative fund that applies the same approach is the imposition of the intermediate "index." In our view, this is active management, pure and simple, dressed up in index clothing. Has it worked? The fund was introduced in 2003; however, it provides backtesting results covering 1993 - 2003. Over this eleven year period, in comparison with the S&P 500, PWC had positive alpha that averaged 5.145% per year, with a tracking error of 8.90%. Combining these two yields an Information Ratio of 1.92 -- impressive, but still short of statistical significance. More interesting will be the fund's performance going forward. Whether the rules upon which its underlying index is based will continue to generate alpha in the face of evolving changes in the economy and the equity market remains to be seen. And if they do, what is to prevent other smart managers from inferring these rules from PWC's (publicly available) portfolio holdings and trading results, applying them to their own portfolios, and competing away their potential for generating alpha?

As you can see, the basis for a consistently successful "active indexing" strategy is the same as the basis for any other active management strategy: some combination of superior forecasting skill and the number of times you apply it each year. We have repeatedly written about how the former requires either superior information and/or a superior model for making sense of it, and how these advantages are difficult to maintain over the long term. And when it comes to breadth, you face the challenge of balancing the potential additional alpha that you hope to earn from frequent trading against the very real transaction costs that this will incur. In our view, these active management challenges are beyond the skills of most of us, for whom the more prudent course of action is investing in broad asset class indexes.

More Good News About The Commodities Asset Class

A recently published working paper by Gorton and Rouwenhorst ("Facts and Fantasies About Commodity Futures") provides further evidence of why it usually makes sense to have the commodities asset class in your portfolio. The paper analyzes the performance of an equally weighted index of commodity futures that over the period beginning in July, 1959 and ending in March, 2004. This research is relevant to index investors, because the currently available commodities index funds are all based on investments in commodities futures. However, these funds are based on underlying indexes (the Goldman Sachs Commodities Index and the Dow Jones - AIG Commodities Index) that use unequal weights for different commodities (based, for example, on their relative importance in the economy). For simplicity the Gorton and Rouwenhorst study uses an equally weighted index of 34 different commodities. Despite this difference, this study's findings are extremely interesting.

The authors begin by noting that "the economic function of corporate securities such as stocks and bonds is to raise external resources for a firm." In contrast, "commodity futures are quite different; they do not raise resources for firms to invest [in their operations]. Rather, commodity futures allow firms to obtain insurance for the future value of their outputs or inputs. Investors in commodity futures receive compensation for bearing the risk of short-term commodity price fluctuations…Because foreseeable trends in spot [i.e., physical] market commodity prices are taken into account when the futures price is set, expected movements in the spot price are not a source of return to an investor in the futures. Rather, purchasers of futures contracts [earn positive returns] when the spot price at the maturity of the futures contract turns out to be higher than expected when they purchased the contract. They lose when the spot price is lower than anticipated. A futures contract is therefore a bet on the future spot price, and by entering into a futures contract an investor assumes the risk of unexpected movements in the future spot price."

However, since "unexpected deviations from the expected future spot price are by definition unpredictable, they should average out to zero over time…What then is the [source of] the return an investor in futures expects to earn? The answer is the risk premium, which is the difference between the current futures price and the [slightly higher] expected future spot price."

The authors then go on to compare the historical returns on their commodities futures index with those on other asset classes. Over the 43 year period they cover, their commodity futures index delivered average annual nominal returns of 11.02% (in U.S. Dollars), with a standard deviation of 12.12%. During this same period, the S&P 500 also had average annual returns of 11.02%, but with a standard deviation of 14.90%. The premium over bond returns for both asset classes was 3.31%.

Equally as important were the correlations of returns the authors found. On ann annual basis, the correlation between stock and commodity returns was negative (.11) -- in other words, when stock returns declined, commodity futures returns tended to rise. Moreover, this negative correlation increased to (.44) when five year holding period returns were compared. In other words, the diversification benefits from holding commodities in a portfolio increase for investors with longer time horizons. To put this in a slightly different context, the authors found that "during the 5% of the months with the worst performance of equity markets, when stocks fell on average by 9.18%, commodity futures experienced a positive return of 1.43%."

The correlation with inflation was also very interesting. For stocks it was negative (.19). While this was better than bonds (.33) correlation, it was still negative -- returns on both asset classes tended to decline when inflation increased. In comparison, the correlation between commodity returns and inflation was positive .31. In short, as a hedge against inflation, commodities were superior to stocks and bonds. Finally, the authors also found that the returns on their commodity index were positively skewed, while those on equities were negatively skewed. The authors concluded that "the slightly higher [standard deviation] of equities, and the opposite skewness [from commodities] together imply that equities have more downside risk relative to commodities."

Just to make sure that their conclusions weren't solely applicable to the United States, the authors repeated their analysis from the perspective of investors located in the UK and Japan. Their results were the same. Finally, the authors tested the performance of their commodity futures index against an index comprising the shares of commodity producing companies. They found that "over the 41 year period between 1962 and 2003, the cumulative performance of the commodity futures index was triple the cumulative performance of the

matching equities index." In sum, the authors conclude that "the diversification benefits of commodity futures work well when they are needed most."

Another SEC Investigation About to Explode

We have frequently written in these pages about our frustration with the structure of many defined contribution pension plans. We have three main complaints. First, they usually don't offer a wide enough range of asset classes. Second, they do not offer broad index funds that track those asset classes. Third, too often their default asset allocation usually includes a very high percentage of money market and stable value funds which are inappropriate for most employees. Why do we still find these situations in so many defined contribution pension plans? In the United States, the Securities and Exchange Commission is about to give us an answer. And it may well be a bombshell.

Here's the background. Many pension plans (both defined benefit and defined contribution) hire third party consultants to advise them on critical issues such as asset allocation and the selection of either investment managers (in the case of defined benefit plans) or mutual funds (in the case of defined contribution plans) within each asset class. For this service, the consultants charge the pension plan a fee. In exchange, they have a fiduciary duty to the plan and its participants to provide disinterested advice.

To make a long story short, since last year the SEC has been examining whether the consultants have, in essence, violated this fiduciary duty by taking payments (through various means) from the very investment managers and mutual funds whose services they are expected to objectively evaluate on behalf of their pension clients. While not as obvious as straight-forward kickbacks, these payments have taken the form of practices like charging money managers high fees to attend "educational conferences" sponsored by the pension consulting firm, or selling them advice on how to market their products to pension funds. The problem for the pension industry is that the fees it earns from consulting to pension plans are now apparently dwarfed by the fees it earns from the money managers. In a curious way, this makes sense, doesn't it? Why wouldn't you lowball your bid for a pension consulting contract if your role as a gatekeeper was the key to selling your high priced educational conferences and "marketing consulting" products to a much larger universe of money managers? How

different is this from Gillette selling razors cheaply in order to make its real money on the blades? Of course, the consultants might have a leg to stand on if they had fully disclosed these business practices and the potential conflicts they create to their pension fund clients. But few have taken this step.

The potential damage done by these practices could be huge (lawyers, take note). Consider a pension plan with $1 billion in assets. If an inferior manager who was recommended based on its ties to a consultant costs the plan just 1% per year in foregone returns, that amounts to a loss of $10 million each year (not including compounding) for the plan's participants. Like we said, this one looks like it is going to get uglier before it gets better.

Three Interesting New Fixed Income Funds

With relatively few fixed income funds available to investors, the introductions of new ones always catches our attention. Four recent ones are worthy of note. With inflation rising, Salomon Brothers Asset Management (the last firm to carry that once great name, now a subsidiary of Smith Barney, which itself is part of the Citigroup colossus) has introduced a new closed end fund in the United States. Called the Inflation Management Fund (ticker symbol IMF), the fund will hold at least 80% of its assets in real return bonds issues by U.S. and non-U.S. governments, and up to 20% in high yield bonds, including emerging markets bonds. To further boost returns, the fund may employ leverage equal to a maximum of 33% of its assets. Doesn't this sound like a shrunken version of the old Salomon Brothers proprietary fixed income trading desk made famous in the book Liar's Poker, by Michael Lewis? And it can all be yours for a front end sales load of 4.5%, along with annual expenses of between .81% and 1.76%, depending on the amount of leverage used. We look forward to tracking its returns.

On the currency front, a firm called Everbank has introduced three certificate of deposit products whose returns are tied to baskets of non-U.S. dollar currencies. The "Viking" is linked to those of Sweden, Denmark, and Norway; the "Petrol" to Norway, the UK, and Mexico, and the "Commodity" to the Australian, New Zealand, Canadian, and South African currencies. Apparently this is what happens when your marketing department trumps

your investment department. While we applaud Everbank for trying to make available more products that allow investors to invest in foreign currency fixed income instruments (albeit at the very short end of the yield curve in the case of these CDs), we would much prefer a product that contains a mix of the world's major currencies, perhaps in proportion to the weights used by the Federal Reserve to calculate the U.S. dollar trade-weighted exchange rate. When it comes to foreign currency bonds as an asset class, we still prefer the T. Rowe Price International Bond Fund.

However, that may change in the future. Pacific Investment Management Company (PIMCO), perhaps the best bond managers in the world, have just introduced a new version of their Foreign Bond Fund. While the existing fund (PFODX) hedges its currency exposure, the new one will not. Apparently PIMCO agrees with the position we've long taken, that for investors with long time horizons, hedging this currency risk doesn't make sense, as it reduces the potential diversification benefits from exchange rate changes.

The final product is the Barclays Advantaged Corporate Bond Fund that has recently been launched in Canada. This is an index product that tracks a weighted mix of 67% of the Goldman Sachs InvesTop Index of liquid, high quality U.S. corporate bonds, and 33% of the Goldman Sachs HyTop Index, which is an equally weighted basket of 50 liquid high yield U.S. corporate bonds. In essence, this is a product for investors who wish to take a credit tilt within the U.S. bond market. What we find particularly interesting is the use of the HyTop Index; we expect it won't be long before this becomes the basis for a high yield bond ETF in the United States.

Model Portfolios Year-to-Date Nominal Returns

We offer over 2,000 model portfolio solutions for subscribers whose functional currencies (that is, the currency in which their target income and bequest/savings are denominated) include Australian, Canadian, and U.S. Dollars, Euro, Yen, and Pounds-Sterling. In addition to currency, each solution is based on input values for three other variables:

1. The target annual income an investor wants her or his portfolio to produce, expressed as a percentage of the starting capital. There are eight options for this input, ranging from 3 to 10 percent.
2. The investor's desired savings and/or bequest goal. This is defined as the multiple of starting capital that one wants to end up with at the end of the chosen expected life. There are five options for this input, ranging from zero (effectively equivalent to converting one's starting capital into a self-managed annuity) to two.
3. The investor's expected remaining years of life. There are nine possible values for this input, ranging from 10 to 50 years.

We use a simulation optimization process to produce our model portfolio solutions. A detailed explanation of this methodology can be found on our website. To briefly summarize its key points, in order to limit the impact of estimation error, our assumptions about future asset class rates of return, risk, and correlation are based on a combination of historical data (from 1971 to 2002) and the outputs of a forward looking asset pricing model. For the same reason, we also constrain the maximum weight that can be given to certain asset classes in a portfolio. These maximums include 20% for foreign bonds and foreign equities, and 10% each for commercial property, commodities, and emerging markets equities. There are no limits on the weight that can be given to real return and domestic bonds, and to domestic equities.

Each model portfolio solution includes the following information: (a) The minimum real (after inflation) compound annual rate of return the portfolio must earn in order to achieve the specified income and savings/bequest objectives over the specified expected lifetime. (b) The long-term asset allocation strategy that will maximize the probability of achieving this return,

given our assumptions and constraints. (c) The recommended rebalancing strategy for the portfolio. And (d) The probability that the solution will achieve the specified income and savings/bequest goals over the specified time frame.

The following table shows how asset allocations with different target compound annual rate of return objectives have performed year-to-date:

	YTD 30Jun04	**Weight**	**Weighted Return**
	In US$		In US$
7% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	1.8%	0%	**0.0%**
U.S. Bonds	0.1%	0%	**0.0%**
Non-U.S. Bonds	-1.9%	20%	**-0.4%**
Commercial Property	5.1%	10%	**0.5%**
Commodities	7.9%	10%	**0.8%**
U.S. Equity	3.1%	50%	**1.6%**
Foreign Equity (EAFE)	4.9%	0%	**0.0%**
Emerging Mkt. Equity	-1.6%	10%	**-0.2%**
		100%	**2.3%**

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	YTD 30Jun04	**Weight**	**Weighted Return**
	In US$		In US$
6% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	1.8%	0%	**0.0%**
U.S. Bonds	0.1%	0%	**0.0%**
Non-U.S. Bonds	-1.9%	20%	**-0.4%**
Commercial Property	5.1%	10%	**0.5%**
Commodities	7.9%	10%	**0.8%**
U.S. Equity	3.1%	45%	**1.4%**
Foreign Equity (EAFE)	4.9%	5%	**0.2%**
Emerging Mkt. Equity	-1.6%	10%	**-0.2%**
		100%	**2.4%**

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	YTD 30Jun04	Weight	Weighted Return
	In US$		In US$
5% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	1.8%	0%	**0.0%**
U.S. Bonds	0.1%	0%	**0.0%**
Non-U.S. Bonds	-1.9%	20%	**-0.4%**
Commercial Property	5.1%	10%	**0.5%**
Commodities	7.9%	10%	**0.8%**
U.S. Equity	3.1%	30%	**0.9%**
Foreign Equity (EAFE)	4.9%	20%	**1.0%**
Emerging Mkt. Equity	-1.6%	10%	**-0.2%**
		100%	**2.7%**

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	YTD 30Jun04	Weight	Weighted Return
	In US$		In US$
4% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	1.8%	5%	**0.1%**
U.S. Bonds	0.1%	35%	**0.0%**
Non-U.S. Bonds	-1.9%	20%	**-0.4%**
Commercial Property	5.1%	10%	**0.5%**
Commodities	7.9%	10%	**0.8%**
U.S. Equity	3.1%	5%	**0.2%**
Foreign Equity (EAFE)	4.9%	10%	**0.5%**
Emerging Mkt. Equity	-1.6%	5%	**-0.1%**
		100%	**1.6%**

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	YTD 30Jun04	Weight	Weighted Return
	In US$		In US$
3% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	1.8%	75%	**1.4%**
U.S. Bonds	0.1%	0%	**0.0%**
Non-U.S. Bonds	-1.9%	10%	**-0.2%**
Commercial Property	5.1%	10%	**0.5%**
Commodities	7.9%	5%	**0.4%**
U.S. Equity	3.1%	0%	**0.0%**
Foreign Equity (EAFE)	4.9%	0%	**0.0%**
Emerging Mkt. Equity	-1.6%	0%	**0.0%**
		100%	**2.1%**

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	YTD 30Jun04	Weight	Weighted Return
	In US$		In US$
2% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	1.8%	85%	**1.5%**
U.S. Bonds	0.1%	0%	**0.0%**
Non-U.S. Bonds	-1.9%	10%	**-0.2%**
Commercial Property	5.1%	5%	**0.3%**
Commodities	7.9%	0%	**0.0%**
U.S. Equity	3.1%	0%	**0.0%**
Foreign Equity (EAFE)	4.9%	0%	**0.0%**
Emerging Mkt. Equity	-1.6%	0%	**0.0%**
		100%	**1.6%**