# Retired Investor

*Invest Wisely…Get an Impartial Second Opinion.*

## This Month's Feature Articles: Key Points

Our first article this month looks at the critical issue of the impact of global aging on asset class returns. Much has been written of late about the "meltdown scenario" in which the cost of an aging population will overwhelm our national social security (state pension) system, and the rush of seniors' liquidating their savings to generate retirement income will simultaneously cause a crash in asset prices. However, we find that considerable uncertainty still surrounds this issue, and it is still too early to draw strong conclusions. We provide eight indicators to monitor that lower the probability that the meltdown scenario will happen: reductions in the benefits promised by social security programs, increases in their minimum retirement age, changes from pay-as -you-go to funded social security systems, evidence of increased saving by retirees (for either precautionary purposes, or to fund bequests), increased inflows of foreign savings, higher savings rates by the baby buster generation, increases in productivity and growth in immigration. We also analyze the likely impact of our two scenarios (meltdown and no meltdown) on different asset classes.

This month's product and strategy notes address three interesting issues. The first is lifecycle funds, whose value proposition is easily summarized: "tell us the year you want to achieve your goal, and leave the asset allocation to us." In practice, they all operate the same way, moving from a higher risk/higher return asset allocation to a lower risk/lower return asset allocation as their target date approaches. We have a number of criticisms of these funds, which we describe in this issue. On balance, we conclude that they have only one application that makes sense to us: as the default option in defined contribution pension plans.

Our second product and strategy note looks at the new closed end mutual funds that are being launched in the United States by the managers of large leveraged buyout funds. Does this represent an attractive way for individuals to invest in the private equity asset class? We think not. Finally, we take another look at style, sector, and bond market rotation

strategies, and what their year-to-date returns may be telling us about what lies ahead for the economy.

## This Month's Letter to the Editor

*Assuming you wanted to take a tilt toward small value stocks in the United States, do you have a preference from among the many funds on offer?*

Let me first say that this is not at all an easy question to answer. So please be patient with what is going to be a rather long answer to a short quesiton! Let's start with a quick review of the major small cap indexes.

Standard and Poor's produces the large cap 500, mid-cap 400, and small-cap 600 indexes. The funds included in each index are chosen by a committee at S&P, and are intended to be both liquid (that is, easily investable) and broadly representative of three size segments of the U.S. equity market. In terms of the percentage of total market capitalization they represent, the S&P 500 includes companies that account for about 80% of total U.S. equity market capitalization, the 400 covers 7%,and the 600 covers 3% (a recently introduced ETF called the S&P 1500 combines these three indexes, and covers about 90% of total U.S. equity market capitalization).

The second major set of indexes is produced by the Frank Russell Company. Its Russell 1000 includes the 1000 largest companies in the U.S. equity market ranked by market capitalization, which account for about 92% of the total market's capitalization. The Russell 2000 includes the next 2000 companies ranked by market capitalization. It accounts for about 6% of total market capitalization (hence the overall Russell 3000 Index covers about 98% of total U.S. equity market capitalization). The Russell MidCap Index includes the bottom 800 companies in the Russell 1000, which collectively account for 24% of U.S. equity market capitalization. Here is our first "watch out": if you invested in an ETF which tracks the Russell 1000 thinking you were buying a large cap fund, and then also invested in the ETF that tracks the Russell Mid-Cap, you would end up with a higher than intended investment in the 800 companies that are included in both indexes.

The third set of major indexes is produced by Morgan Stanley Capital International. Last year, Vanguard switched many of its index funds (both mutual and ETF) to these indexes (thought its large cap index mutual fund still tracks the S&P 500). MSCI constructs its size based indexes in a manner similar to Russell: the top 300 companies by market capitalization make up its large cap index, and cover 74% of U.S. equity market capitalization. The next 450 funds make up the mid-cap index, and cover a further 13% of total market capitalization. Finally, the next 1750 companies make up the small cap index, which covers 11% of total market capitalization. As you can see, both Russell (with 3000 companies in its indexes) and MSCI (with only 2500 in its indexes) claim to cover 98% of the U.S. equity market -- so somebody's math is off a bit (actually, the more likely problem is that they did their valuations at different dates. Logically, Russell's coverage must be slightly higher). So far, so good. However, MSCI also produces something called its "Prime Market" index, which includes the top 750 companies by market capitalization (that is, about 87% of the total market cap). This serves as the basis for Vanguard's large cap growth and value indexes. So, a second watch out: as in the case of Russell, if you're not careful here you can end up with a higher than intended weight on mid-cap companies.

The fourth set of indexes is produced by DowJones and Company. Unlike the other index providers, DJ holds constant the percentage of market capitalization covered by its indexes, and varies the number of companies in them to achieve this. The DowJones large cap index consistently covers the top 70% of market cap, the mid-cap index covers the next 20% of market cap, and the small cap covers the next 5% of market cap, for total coverage of 95%. Of the four major sets of indexes, on balance we prefer those from Dow Jones, because of their consistent methodology and clear delineation between market cap coverage levels.

Now let's add fund from Dimensional Fund Advisers (DFA) to this, and focus just on the small cap indexes. DFA's small cap universe includes the bottom 8% of market capitalization. Unlike the other four, it picks up micro-cap stocks. As a comparison, the table below also includes the Bridgeway Ultra-Small Company Market Fund (BRSIX), which tracks the companies in the lowest 10% of the market capitalization of the Center For Research in Securities Prices (CRSP) U.S. equities database (which is similar to the Wilshire 5000). While not a value index, it will help us to disentangle small company from value effects in recent returns. DFA also has a fund based on what it calls is small cap XM (ex-

microcaps) universe, which includes companies whose market cap range covers 2.5% to 12.5%. As the following table and chart make clear, there are significant differences between what each of these six indexes means by the term "small cap." And people wonder why investors sometimes feel overwhelmed...

Let's now move on to a quick look at the way each index company produces its style (growth vs. value) indexes. Standard and Poor's uses a single factor -- the price/book ratio -- to divide its small cap 600 universe into two equal "growth" and "value" style indexes. DFA notes that it primarily uses price/book, but "other factors may be considered." Russell uses two factors to produce its indexes: price/book and forecast earnings growth. Moreover, it does not cleanly divide every company into one category or another; some companies (whose categorization is ambiguous based on the two factors) are partially included in both indexes. Finally, MSCI uses three factors and Dow Jones uses six factors to classify a company as "growth" or "value". MSCI forces 100% of the small cap market capitalization to be assigned to either the growth or value index (though, like Russell, some companies' market cap is split between the two). In contrast, Dow Jones does not automatically include 100% of its small cap universe in its growth and value style indexes. Companies' whose style classification is ambiguous are left out of the growth and value indexes. As a result, the Dow Jones style indexes are thought to be more "pure" than the others, as evidenced by the larger differences in results between their respective growth and value indexes compared to those produced by S&P, Russell and MSCI.

Let me sum up. I assume that your goal is to capture the long-term return premiums that accrue to small cap and to value stocks. If you believe that most of the premium on the former will be earned by the smallest of the small stocks, then the DFA Small Cap value fund is attractive. However, if you believe more of it over the long-term will come from the value tilt, then we prefer the style classification approach employed by Dow Jones.

On balance, we have concluded that the research supporting the existence of a long-term value premium is stronger than the research supporting the existence of a long-term size premium. Therefore, if we were forced to choose just one product in the small cap value category, it would be DSV, the ETF that tracks the Dow Jones Small Cap Value Index.

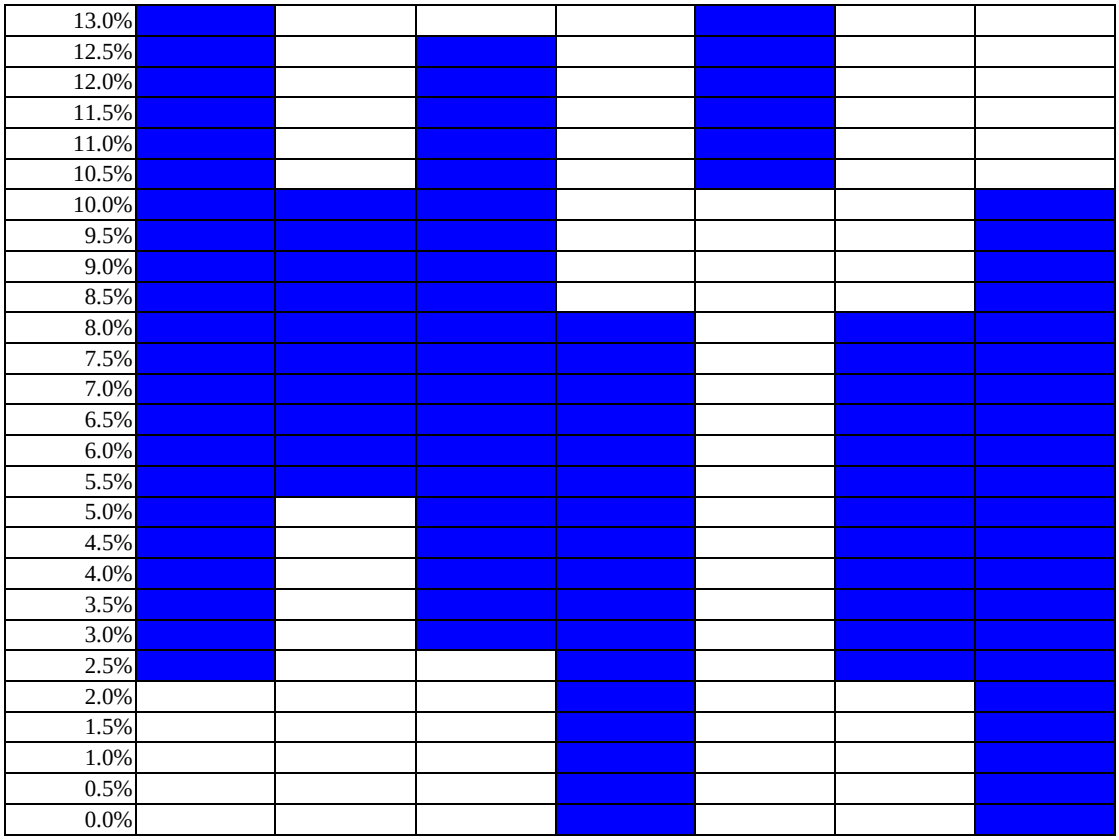
# Small Cap Value Funds Compared

| Index | MSCI Small Value | Dow Jones Small Value | DFA XM Value | DFA Small Value | S&P 600 Small Value | Russell 2000 Value | CRSP 10** |
|---|---|---|---|---|---|---|---|
| 2003 Return | 44.1%* | 42.1% | 54.1% | 59.4% | 39.5% | 46.1% | 79.4% |
| Ticker | VBR | DSV | DFFVX | DFSVX | IJS | IWN | BRSIX |

* Index less .22 fund expense **This is a microcap size, but not a value tilted index

***Percent of Market Capitalization Covered by Index***

| Index | MSCI Small Value | Dow Jones Small Value | DFA XM Value | DFA Small Value | S&P 600 Small Value | Russell 2000 Value | CRSP 10** |
|---|---|---|---|---|---|---|---|



# Global Asset Class Returns

| YTD 28May04 | In USD | In AUD | In CAD | In EURO | In JPY | In GBP |
|---|---|---|---|---|---|---|
| Asset Held | | | | | | |
| **US Bonds** | -0.40% | 4.67% | 4.42% | 2.50% | 2.25% | -3.09% |
| **US Prop.** | 2.30% | 7.37% | 7.12% | 5.20% | 4.95% | -0.39% |
| **US Equity** | 1.40% | 6.47% | 6.22% | 4.30% | 4.05% | -1.29% |
| | | | | | | |
| **AUS Bonds** | -7.23% | -2.15% | -2.41% | -4.33% | -4.57% | -9.91% |
| **AUS Prop.** | 5.92% | 10.99% | 10.74% | 8.81% | 8.57% | 3.23% |
| **AUS Equity** | -1.20% | 3.87% | 3.62% | 1.70% | 1.45% | -3.89% |
| | | | | | | |
| **CAN Bonds** | -4.14% | 0.93% | 0.68% | -1.24% | -1.49% | -6.83% |
| **CAN Prop.** | -18.22% | -13.15% | -13.40% | -15.33% | -15.57% | -20.91% |
| **CAN Equity** | -4.60% | 0.47% | 0.22% | -1.70% | -1.95% | -7.29% |
| | | | | | | |
| **Euro Bonds** | -1.61% | 3.46% | 3.21% | 1.29% | 1.04% | -4.30% |
| **Euro Prop.** | 6.38% | 11.45% | 11.20% | 9.28% | 9.03% | 3.69% |
| **Euro Equity** | -1.10% | 3.97% | 3.72% | 1.80% | 1.55% | -3.79% |
| | | | | | | |
| **Japan Bonds** | -3.10% | 1.97% | 1.72% | -0.20% | -0.45% | -5.79% |
| **Japan Prop.** | 26.29% | 31.37% | 31.11% | 29.19% | 28.94% | 23.61% |
| **Japan Equity** | 3.60% | 8.67% | 8.42% | 6.50% | 6.25% | 0.91% |
| | | | | | | |
| **UK Bonds** | 2.17% | 7.24% | 6.99% | 5.07% | 4.82% | -0.52% |
| **UK Prop.** | 28.76% | 33.84% | 33.58% | 31.66% | 31.42% | 26.08% |
| **UK Equity** | 2.10% | 7.17% | 6.92% | 5.00% | 4.75% | -0.59% |
| | | | | | | |
| **World Bonds** | -1.25% | 3.82% | 3.57% | 1.65% | 1.40% | -3.94% |
| **World Prop.** | 6.70% | 11.77% | 11.52% | 9.60% | 9.35% | 4.01% |
| **World Equity** | 1.60% | 6.67% | 6.42% | 4.50% | 4.25% | -1.09% |
| **Commodities** | 12.90% | 17.97% | 17.72% | 15.80% | 15.55% | 10.21% |
| **Hedge Funds** | 0.67% | 5.74% | 5.49% | 3.57% | 3.32% | -2.02% |
| | | | | | | |
| **A$** | -5.07% | 0.00% | -0.25% | -2.18% | -2.42% | -7.76% |
| **C$** | -4.82% | 0.25% | 0.00% | -1.92% | -2.17% | -7.51% |
| **Euro** | -2.90% | 2.18% | 1.92% | 0.00% | -0.25% | -5.58% |
| **Yen** | -2.65% | 2.42% | 2.17% | 0.25% | 0.00% | -5.34% |
| **UK£** | 2.69% | 7.76% | 7.51% | 5.58% | 5.34% | 0.00% |
| **US$** | 0.00% | 5.07% | 4.82% | 2.90% | 2.65% | -2.69% |

## 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, 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 | 3.24% | 4.00% | 7.24% | 4.90% | 3.65% | 8.55% |
| Canada | 2.29% | 4.00% | 6.29% | 2.10% | 1.94% | 4.04% |
| Eurozone | 1.48% | 4.00% | 5.48% | 2.50% | 2.72% | 5.22% |
| Japan | 1.13% | 4.00% | 5.13% | 2.70% | 0.93% | 3.73% |
| U.K. | 1.95% | 4.00% | 5.95% | 2.50% | 3.30% | 5.80% |
| U.S.A. | 2.41% | 4.00% | 6.41% | 4.50% | 1.69% | 6.19% |

**High Productivity Growth Scenario. See website (green button, "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 | 155.98 | 100.00 | -56% | -9% |
| Canada | 46.30 | 100.00 | 54% | 63% |
| Eurozone | 91.28 | 100.00 | 9% | 39% |
| Japan | 39.91 | 100.00 | 60% | 72% |
| U.K. | 95.65 | 100.00 | 4% | 33% |
| U.S.A. | 88.48 | 100.00 | 12% | 42% |

*High productivity growth scenario.

At the suggestion of a number of readers, this month we have expanded our equity market valuation analysis. As we have described, our estimate of over or undervaluation 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 | 3.65% | 3.24% | 3.59% | 4.31% | 5.31% |
| Canada | 1.94% | 2.29% | 4.35% | 0.75% | 1.75% |
| Eurozone | 2.72% | 1.48% | 2.76% | 2.24% | 3.74% |
| Japan | 0.93% | 1.13% | 4.20% | 1.60% | 2.60% |
| United Kingdom | 3.30% | 1.95% | 2.65% | 2.35% | 3.85% |
| United States | 1.69% | 2.41% | 4.72% | 2.78% | 3.78% |

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 | 3.24% | 2.96% | 6.20% | 5.84% | -0.36% | 3.45% |
| Canada | 2.29% | 2.40% | 4.69% | 4.76% | 0.07% | -0.67% |
| Eurozone | 1.48% | 2.37% | 3.85% | 4.32% | 0.47% | -4.42% |
| Japan | 1.13% | 0.77% | 1.90% | 1.51% | -0.39% | 3.91% |
| UK | 1.95% | 3.17% | 5.12% | 5.15% | 0.03% | -0.28% |
| USA | 2.41% | 2.93% | 5.34% | 4.65% | -0.69% | 6.79% |

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:

| | To A$ | To C$ | To EU | To YEN | To GBP | To US$ |
|---|---|---|---|---|---|---|
| From | | | | | | |
| **A$** | 0.00% | -1.08% | -1.52% | -4.33% | -0.69% | -1.19% |
| **C$** | 1.08% | 0.00% | -0.44% | -3.25% | 0.39% | -0.11% |
| **EU** | 1.52% | 0.44% | 0.00% | -2.81% | 0.83% | 0.33% |
| **YEN** | 4.33% | 3.25% | 2.81% | 0.00% | 3.64% | 3.14% |
| **GBP** | 0.69% | -0.39% | -0.83% | -3.64% | 0.00% | -0.50% |
| **US$** | 1.19% | 0.11% | -0.33% | -3.14% | 0.50% | 0.00% |

For example, ten-year Eurozone government bonds currently have a nominal yield of 4.32%. Assume their purchase is being considered by an Ainvestor whose functional currency is Australian Dollars. Given the estimated annual change in the A$/Euro exchange rate of 1.52% (that is, the Euro is expected to appreciate vs. the A$), the estimated A$ return on the Eurozone bond is 4.32% + 1.52% =5.84%, which is exactly equal to the expected yield on the domestic Australian government bond.

## Global Aging and Asset Class Returns

From time to time, slightly different versions of the same scary scenario are repeated around the world: the cost of an aging population will overwhelm our national social security (state pension) system, while the rush of seniors' selling their assets to generate retirement income will simultaneously cause a crash in their prices (known as the "meltdown scenario"). A good example of this is the new book The Coming Generational Storm by Kotlikoff and Burns. What are the chances of this scenario coming to pass? And, more broadly, what are the implications of global aging for asset allocation? These are the two key questions this article will address.

Unfortunately, history is of little help in answering them, since the current aging process is unlike anything the world has seen before. Two of the best recent explorations of the past relationship between population age structure and asset returns have found only weak evidence that they are related (see "Population Age Structure and Asset Returns" by James Poterba, and "Demographics and Financial Asset Prices in the Major Industrial Economies"

by Davis and Li). These studies face an insurmountable obstacle: large demographic changes happen so rarely, and over such long periods of time, that it is next to impossible to identify statistically significant relationships between them and financial market returns. The necessary demographic data simply don't exist.

We are thus left with the need to reason deductively on the basis of different theories to answer the questions we posed. Here too we confront problems: the theories themselves aren't always in agreement about the likely impact of population aging. In sum, there are no clear-cut answers to the questions we posed. Lacking them, this article will provide an overview of different outcomes that could happen (and why), and their implications for asset class returns and asset allocation strategy. We will also provide a set of indicators to monitor over time that should help us better understand the scenario that is developing. Given the importance of this subject, we will regularly review these indicators in the future, and report our results.

We will begin with an overview of the basic demographic situations in our six different currency areas, and how they are expected to evolve in the future. We will then move on to how demographic change may affect the economy. Then we will move on to the potential impact on asset class returns.

## Demographic Trends

One way of looking at the structure of a population is to divide it into three groups: the young, the workers, and the seniors. For example, the data we will cite below (from the U.S. Census) classifies people aged 0 to 14 as youth, 15 to 64 as potential workers, and those 65+ as seniors. The key concept is that people of working age play an important role in providing for the needs of the other two groups, as well as their own needs. To be sure, seniors' consumption is also paid for out of their savings; however, in many regions a substantial part of it is paid for (via state pension programs -- e.g., Social Security and Medicare in the United States) via transfer payments from workers. This gives rise to a key metric known as the "dependency ratio", which measures the number of working age adults per either senior citizen or senior citizen plus youth.

In calculating the latter ratio, it is important to recognize that the consumption needs of a youth are less than those of a senior -- one common rule of thumb is that the average cost of a youth's annual consumption of goods and services is only 33% as much as that of a senior citizen (largely because of the difference in average medical costs). Hence another common rule of thumb: an "adjusted" dependency ratio which divides the number of working age adults by the sum of the number of senior plus one third of the number of youths. The following tables present projections by the U.S. Census that show changes in population structures in different regions, and the impact they will have on dependency ratios.

***Change in Population Structure, 2000-2050***
***In Percent***

| | 2000 | 2025 | 2050 | 2000-2050 Change |
|---|---|---|---|---|
| **Japan** | | | | |
| 0 to 14 | 14.8 | 12.2 | 12.6 | **-2.2** |
| 15 to 64 | 68.1 | 59.7 | 53.1 | **-15.0** |
| 65+ | 17.1 | 28.0 | 34.3 | **17.2** |
| **Western Europe** | | | | |
| 0 to 14 | 16.8 | 14.2 | 13.8 | **-3.0** |
| 15 to 64 | 66.9 | 63.1 | 57.1 | **-9.8** |
| 65+ | 16.3 | 22.7 | 29.1 | **12.8** |
| **Australia** | | | | |
| 0 to 14 | 20.9 | 17.0 | 15.4 | **-5.5** |
| 15 to 64 | 66.7 | 63.5 | 60.0 | **-6.7** |
| 65+ | 12.4 | 19.5 | 24.6 | **12.2** |
| **Canada** | | | | |
| 0 to 14 | 19.2 | 15.8 | 15.1 | **-4.1** |
| 15 to 64 | 68.1 | 63.5 | 60.0 | **-8.1** |
| 65+ | 12.7 | 20.7 | 24.9 | **12.2** |
| **UK** | | | | |
| 0 to 14 | 18.9 | 15.7 | 14.6 | **-4.3** |
| 15 to 64 | 65.5 | 63.9 | 59.8 | **-5.7** |
| 65+ | 15.6 | 20.4 | 25.7 | **10.1** |

| | 2000 | 2025 | 2050 | 2000-2050 Change |
|---|---|---|---|---|
| **United States** | | | | |
| 0 to 14 | 21.4 | 19.9 | 19.7 | **-1.7** |
| 15 to 64 | 66.2 | 61.9 | 59.7 | **-6.5** |
| 65+ | 12.4 | 18.2 | 20.6 | **8.2** |

The following two tables show how these population changes will affect dependency ratios. The first table shows only the number of working age population per senior, while the second also includes youth (at 33%, as discussed above).

***Number of Working Age Population per Senior***

| | 2000 | 2025 | 2050 | Pct. Change, 2000-2050 |
|---|---|---|---|---|
| Japan | 4.0 | 2.1 | 1.5 | **-61%** |
| Western Europe | 4.1 | 2.8 | 2.0 | **-52%** |
| Australia | 5.4 | 3.3 | 2.4 | **-55%** |
| Canada | 5.4 | 3.1 | 2.4 | **-55%** |
| United Kingdom | 4.2 | 3.1 | 2.3 | **-45%** |
| United States | 5.3 | 3.4 | 2.9 | **-46%** |

***Number of Working Age Population per Senior and (1/3) Youth***

| | 2000 | 2025 | 2050 | Pct. Change, 2000-2050 |
|---|---|---|---|---|
| Japan | 3.1 | 1.9 | 1.4 | **-55%** |
| Western Europe | 3.1 | 2.3 | 1.7 | **-45%** |
| Australia | 3.5 | 2.5 | 2.0 | **-42%** |
| Canada | 3.6 | 2.5 | 2.0 | **-44%** |
| United Kingdom | 3.0 | 2.5 | 2.0 | **-35%** |
| United States | 3.4 | 2.5 | 2.2 | **-35%** |

As these projections show, the combined impact of declining birth rates and increasing life expectancy is very substantial indeed. However, we should also point out that like all demographic projections, these are subject to a high degree of uncertainty. A recent paper ("Seismic Shifts: The Economic Impact of Demographic Change: An Overview" by Little and Triest) provided a good summary of this issue. "While we can discern the general trajectory of demographic trends, the uncertainty surrounding these projections is huge…Much is still unknown about how population shifts will affect the economy, particularly as some forecasted demographic developments are entirely unprecedented…Areas of great uncertainty include the size of future migrations, particularly from Africa to Europe; the degree to which current low fertility rates in Japan and much of Europe will rise toward replacement levels; the rate at which high fertility rates in the developing world will fall toward replacement levels; the extent to which life expectancy will increase over the next century; and the pace at which medical costs will increase. Add to these questions the possibility of massive environmental change or political upheaval, and one comes away impressed with the wide range of possible scenarios for the evolution of demographic change and its economic consequences."

This article also made the important point that "the dependency ratio is a fuzzy concept. Not all 15-64 work and those over 65 represent different burdens depending on their health and medical costs…[For example] longitudinal surveys indicate that chronic disability among the elderly could be declining as fast as 1.5% per year. Such a rate of decline would likely keep the ratio of the economically active aged 20 to 64 to the chronically disabled aged 65 and older from falling below recent levels." In sum, dependency does not equal economic burden, which is another source of uncertainty in this analysis.

## The Impact of Population Aging on the Economy

To describe the possible impact of population aging on the economy, we will start with a simple model that illustrates some key theoretical concepts. We will then add new elements to it to make it more realistic. We will end by highlighting the key uncertainties in this analysis.

Our first model has no government or international sectors. It passes through three demographic stages. The first stage is a rise in fertility -- a baby boom. During this stage, parents spend more money on their children, and have less available to save. Since in our closed economy, private sector savings must equal private sector investment, the lack of the former limits the latter. However, low investment per worker limits productivity growth (output per worker), which in turn limits wage growth (that is, the return to labor is relatively low). In contrast, because savings are scarce, the expected return on investment (that is, the relative return to capital) is high.

In the second stage of the model, the baby boomers move into the workforce. This raises the demand for investment -- for example, to house and equip these new workers. Fortunately, with their children on their own, the boomers' parents can raise their savings rate. More investment per worker raises productivity, wages, and the relative return to labor. In contrast, with more savings available, the expected return on investment declines as asset prices are bid up. This stage actually comprises two sub-stages. In the first, boomers have just entered the workforce (and started their own families) while their parents are in their peak earning and savings years. However, they have fewer children than their parents did. As Little and Triest described in their paper, "as income increases beyond some threshold, the birth rate starts to fall instead of continuing to rise…Raising children and consuming goods and services both take time. As income goes up, and people can afford to increase their consumption, they choose to spend less time on children and the birth rate decreases." In the second sub-stage, the boomers' parents retire, and the boomers reach their peak earning and savings years.

In the third stage of our model, the boomers themselves retire, and begin to liquidate their savings to finance their consumption. Unless the remaining workers (i.e., the "baby busters") increase their own saving rate, investment per worker will not increase, nor will their productivity or wages. In short, the relative return to labor will fall. Moreover, because fewer busters exist to buy those assets from the seniors, asset prices will decline (assuming current workers choose to save the same percentage of their income as the boomers). This is the "meltdown scenario". The fall in asset prices will in turn raise the expected return on capital. However, this will not necessarily be the same for all asset classes. As we have pointed out in past issues, all else being equal, the greater a person's remaining work years ,

the greater the proportion of their portfolio that can be invested in higher risk, higher return assets. The theory here is that with more years left to work, you have more opportunities to work harder to make up for a shortfall in your portfolio returns, and still achieve your target retirement income. Conversely, with few years of labor income left, your portfolio will tend to shift to lower risk assets. Hence in our meltdown scenario, riskier assets (e.g., equities) may experience the greatest price falls (and increased in expected returns), while safer assets (e.g., real return bonds) may actually experience a rise in price and a fall in expected returns. On the other hand, this assumes a constant stock of outstanding equities and bonds; in reality, issuers will also respond to changing returns -- e.g., by issuing new bonds (which would limit any price gains) or repurchasing equities (which would limit price falls).

So much for our simple, "closed economy" model. Let's now add another degree of complexity to it, in the form of other countries, which exchange savings, goods, and workers. How does that change things?

In stage one (when the boomers were born, and their parents had little money to save), importing capital (that is, foreign savings) could enable a country to raise its investment per worker above what it was in our closed economy example. As a result, productivity, wages, and the return to labor will be relatively higher, and the return to capital will be relatively lower. Countries whose domestic investment is greater than their domestic savings run current account deficits, and import more goods than they export. This combination of savings and goods flows puts downward pressure on their exchange rate. A depreciating exchange rate in turn makes foreign investments more attractive relative to domestic investments, and slows down the flow of foreign savings into the country. Eventually, this process results in an equilibrium state. An alternative means to achieve this would be through emigration by young workers, which would raise the investment per worker for those who remained.

In stage two (when boomers move into the workforce, and eventually into their peak savings years), the presence of other countries has the opposite impact. In this case, some boomer savings will be invested abroad. This somewhat lowers the level of domestic investment per worker, as well as productivity and wage growth, and the relative return to labor, while raising the relative return to capital. Countries that save more than they invest run current account surpluses -- they export more goods than they import. As a result, their

exchange rates tend to appreciate. This makes domestic investments more attractive in comparison to foreign investments, and eventually stops the flow of savings abroad. This could also be accomplished by an inflow of foreign workers, which would reduce the relative return to domestic labor and raise the return on domestic capital.

In the third stage of our model (when the boomers retire, and the dependency ratio rises), the presence of other countries could ease the problems encountered in the closed economy model. By importing foreign savings (e.g., having foreign investors purchase some of the assets the boomers are selling), the country could limit the increase in returns to capital, while also enabling investment per worker to grow, thereby limiting declines in productivity, wages, and the relative return to labor. Once again, when domestic savings are less than domestic investment, the country would run a current account deficit, import more goods than it exports, and see its exchange rate depreciate. Eventually, this would stop the inflow of foreign savings, and the system would return to balance. In addition, as we noted before, not only savings and goods move between countries; people can too. In this case, the same balance could be accomplished by the emigration of retired boomers to other countries, so that the asset sales by those that remained equaled the desired savings of the buster generation. Alternatively, the size of the buster generation (and its savings) could be augmented by a substantial increase in immigration.

We started with a simple, private sector economy. Next we added an international sector to it. Now let's add a government sector, and see what happens. Specifically, we will add a state pension and health care program that makes payments to seniors by taxing current workers.

In stage one of our model, the existence of the state social security program has little impact, as the existing number of retirees is assumed to be quite small (e.g., because of shorter life expectancies). To the extent there is a discernible effect, it is a reduction of domestic savings (because income is now reduced by both consumption needs and taxes). In our open economy, this leads to a somewhat higher inflow of foreign savings, and a slightly worse current account deficit.

In stage two of our model, with the boomers' parents enjoying longer life expectancies in their retirement, the impact is more pronounced because social security taxes are somewhat higher. Still, it is not overwhelming, because so many more boomers are earning wages.

Again, rising social security taxes hold down domestic savings, which in this case reduces their flow abroad, the size of the current account surplus, and the appreciation of the currency.

In stage three of the model, however, social security has a much larger impact, because of the growing imbalance between the number of workers and the number of boomer retirees (that is, because of the changing dependency ratio). In this case, assuming no change in the benefits paid by the government to boomer retirees (or, equivalently, and change in the age at which they are eligible for them), social security taxes paid by the busters sharply increase, which results in a sharp fall in their savings. If the price of the assets being sold by boomers is to avoid a sharp fall, the inflow of foreign savings must increase. In turn, this will lead to a bigger current account deficit and more downward pressure on the exchange rate. Alternatively, the government could choose to finance the payment of boomer benefits not with rising taxes, but by running a deficit financed by the issuance of government bonds. In terms of the need for foreign savings, this changes nothing, because what counts is an economy's net domestic savings: its private savings less the government budget deficit. So why would a government do this? Because by issuing debt instead of raising taxes to pay for the boomers' social security benefits, it shifts the cost from the busters to their children, and other generations yet unborn. In other words, rather than asking either the retired boomers or the busters to reduce their consumption, using debt to finance social security benefits defers the tax increase (which will be needed to service the debt) to the next generation. Of course, this raises questions about what is called "intergenerational equity", or, more simply, fairness. But given that unborn generations do not vote, it will always be a temptation for governments whose social security systems are based on transfer payments from current to retired workers (these are known as "pay as you go" or PAYG systems).

As you can see, our model is now getting more complex, but also more realistic. Let's now add to it four major uncertainties. The first is the structure of government social security systems. The present value of the future liabilities of many of these systems (assuming no changes in the benefits they promise, or the minimum age at which they can be received) now dwarfs the "on balance sheet" debt of the governments that sponsor them. The burden these liabilities impose on the buster generation can be reduced by a number of means. The simplest is raising the age at which a person becomes eligible to collect the benefits they promise to pay (which might also delay large retiree asset sales). Alternatively, the benefits

themselves can be reduced (which may well increase savings), or made subject to a means test (i.e., you only receive them if your income from other sources is below a minimum level). Finally, governments can shift from PAYG systems to funded systems, which require that workers save a portion of their incomes to pay for their eventual retirement benefits. For example, both Australia and the U.K. have moved to mixed systems, with much smaller PAYG benefits, and a much larger funded component. On the positive side, this would raise savings levels, investment, productivity, and wage growth. On the other hand, a funded pension system still does not eliminate the problem of who will purchase these savings when they need to be sold to finance retirees' consumption spending. You are still left with a choice between (a) higher savings rates by the busters; (b) inflows of foreign savings; (c) inflows of foreign workers; or (d) falls in the price of financial assets.

A recent analysis by the Watson Wyatt consulting firm ("The 2003 Aging Vulnerability Index") ranked twelve developed countries based on the vulnerability of their economies to increases in the cost of their PAYG systems. Because they had already changed to partially funded systems, Australia and the U.K, ranked number one and two (with one being the least vulnerable) on this list. Favorable demographics resulted in the U.S. ranking third. Then came Canada, Sweden, Japan, Germany, the Netherlands, and Belgium in the middle group. The most vulnerable countries included France, Italy and Spain.

The second uncertainty has to do with the future rate of productivity growth. All of our models assume that the only driver of increased output per worker is an increase in investment (capital) per worker. In reality, there is another source of productivity growth, which might be called making better use of existing investment (technically, it is total factor productivity improvement). What we often call "learning by doing" is a good example of this. When the boomers retire, faster productivity growth by the busters would raise their incomes and the amount of their savings. This would limit the adverse price impact caused by boomer asset sales, and reduce the need for increased foreign savings inflows. However, the rate of future productivity growth -- from all sources -- is difficult to forecast with any confidence.

The third uncertainty is the extent to which boomers will actually liquidate their savings when they retire. While theory predicts this will happen (because retirees want to maintain a relatively constant standard of living), this has not been supported by the data that has been collected. In practice, two factors (the relative impact of which is a major point of

academic contention) seem to have limited retiree asset sales. The first is precautionary savings -- for example, retirees may accept reduced incomes in order to have enough money to afford nursing home care, should they need it (or perhaps because they fear a cut in social security benefits). The second is bequests, either intended (i.e., the desire to leave assets to one's heirs), or accidental (i.e., those that occur because the retiree died before he or she expected). The size of the precautionary savings and bequest effects could sharply reduce the size of the potential asset value "meltdown" and the need for either higher buster or foreign savings.

The fourth important uncertainty is whether emerging markets economies will develop to the point that they can provide the savings needed to purchase the assets retired developed country boomers want to sell without triggering the meltdown scenario. Closely related to this is the extent to which developed countries will be able to absorb large numbers of immigrants from these countries. However, a recent analysis ("The Developed World's Demographic Transition" by Fehr, Jokisch, and Kotlikoff) sounds a cautionary note on this issue: "Increased immigration also proves to be a false elixir, if our model is to be believed. Even an immediate and sustained doubling of immigration -- an extreme response by most policymaker's standards -- does very little to mitigate the fiscal stresses facing the developed world. The reasons are three. First, dependency ratios still rise dramatically. Second, since the majority of immigrants arrive with relatively little human capital, their contribution to the total effective supply of labor is far less than their contribution to the total number of workers. And third, because benefits are provided on a progressive basis and immigrants are disproportionately low wage workers, immigrants accrue disproportionately greater claims to old age benefits than do native workers. Hence, the net contribution of increased immigration to long-run fiscal solvency is smaller than it might first appear."

So, let us sum up. This analysis has highlighted eight key indicators that investors should take into account when estimating the probability that the meltdown scenario -- sharp falls in asset prices, especially those in riskier asset classes -- will occur when large numbers of boomers retire:

## *Aging and Asset Class Returns: Key Indicators to Watch*

| Indicator | Outcome That Makes Meltdown More Likely | Outcome That Makes Meltdown Less Likely |
|---|---|---|
| Benefits Promised by State Pension and Healthcare Plans | No reduction in benefits. | Benefits reduced. |
| Age at Which You Become Eligible for Benefits | No change in current age. | Minimum age raised. |
| Pay-As-You-Go versus Funded Social Security System Plan | Country retains system that places high weight on PAYG plan. | Country changes to systemt that gives more weight to funded plan. |
| Retiree Precautionary Savings and Bequest Motives | New data shows that these are turning out to be low. | New data shows that these are turning out to be high. |
| Inflows of Foreign Savings | Low inflows. | High inflows. |
| Buster Generation Savings Rate | Busters save at same or lower rate than boomers. | Busters save at higher rates than boomers. |
| Total Factor Productivity Growth | Low | High |
| Immigration Rate | Low | High |

The Implications for Asset Class Returns

As we have noted, whether or not the meltdown scenario comes to pass will substantially affect the future returns on different asset classes. However, even if it does not occur, we may still expect demographic changes to have an impact. The following table summarizes our current views about how asset class returns may be affected under our two demographic scenarios.

| Asset Class | Meltdown Scenario | No Meltdown Scenario |
|---|---|---|
| Developed Market Real Return Bonds | Prices should stay high, and real yields low. Total return will depend on the amount of new supply issued by governments. Higher supply will limit price rises. Retirees will shift from higher risk assets into RRBs to protect their purchasing power. They will also be attractive assets for pension plans making annuitized benefit payouts. If governments use debt to finance PAYG benefits, the increased threat of inflation may also raise their weight in many portfolios. | Very similar to meltdown scenario, but for less demand due to fear of rising inflation. |
| Developed Market Investment Grade Bonds | Hard to say. Should benefit as retirees' and pension plans shift from equities to lower risk assets. However, this will be offset by increased supply from issuers who face much higher cost of equity. Also, fear of inflation from debt financing of PAYG plans would make these bonds less attractive (as opposed to Australia and the UK, where low PAYG pressures should cause IG bonds to retain their attractiveness). Also, as a nation's current account moves into deficit, exchange rate depreciation would make foreign currency IG bonds more attractive. | Less increase in price and relatively higher yields than meltdown scenario. |

| Asset Class | Meltdown Scenario | No Meltdown Scenario |
|---|---|---|
| Developed Market High Yield Bonds | As meltdown scenario implies lower growth and potentially more inflation, the perceived riskiness of this asset class should increase. This will cause falls in prices and rising yields. It will probably suffer along with equities. | Relatively higher economic growth than under meltdown scenario, along with more seniors seeking high current income may lead to rising demand for these bonds, which will cause increased prices and falling yields. However, to some extent, this will inevitably be offset by increased supply. |
| Emerging Market Bonds | If one contributing factor to the meltdown scenario is the failure of developing countries to get on a high economic growth path, this asset class will increase in risk. | If developed countries increase their domestic consumption and overall economic growth rates, and eventually become capital exporters to aging developed countries, this asset class could see sharp price increases and falling yields. |
| Commercial Property | Probably negative, due to slower economic growth, higher inflation, and less senior purchasing power (e.g., for travel and hotel demand). | Hard to say how the asset class as a whole will perform, because structural trends affect subsegments very differently. Industrial property is hurt by the structural trend to a service economy that may keep offices healthy. Apartments could benefit from seniors downsizing their housing. Hotels could benefit from more senior travel. Healthcare facilities could see increased demand. If emerging markets strengthen, the highest long term commercial property returns could be there. |

| Asset Class | Meltdown Scenario | No Meltdown Scenario |
|---|---|---|
| Residential Property | With less demand for housing from a smaller generation of baby busters, along with higher nominal interest rates (due to inflation fears) and slower economic growth, the outlook isn't good. | Lower rates and stronger economic growth (than the meltdown scenario) are positive. However, returns may will depend on supply restrictions as well as immigration, and the housing demand it stimulates. |
| Commodities | Uncertain outlook. Slower economic growth will reduce the volume demanded, but rising inflation could boost prices. | Strong demand from growing emerging markets countries should keep returns attractive. |
| Developed Market Equities | Shift to less risky assets in retiree and pension plan portfolios is a negative. So too is slower economic growth. Foreign country equities may be more attractive if their economy is stronger due to less PAYG pressure (e.g., Australia? U.K.?, U.S.?) and if one's own currency is depreciating. | Shift to less risky assets in retiree and pension plan portfolios is a negative. However, this could be offset by increased economic growth and growing investment by investors from emerging markets. Foreign country equities may be more attractive if their economy is stronger due to less PAYG pressure (e.g., Australia? U.K.?, U.S.?) and if one's own currency is depreciating. |
| Emerging Markets Equities | Assuming emerging markets do not increase their growth rate, these will suffer early in the generational equity sell-off. | If emerging markets increase their growth rates, these could enjoy very strong long-term returns. |

| Asset Class | Meltdown Scenario | No Meltdown Scenario |
|---|---|---|
| Private Equity | Reduced preference for equity, along with higher expected returns on large company shares (due to falling prices) will make it much harder to realize high returns on buyouts and venture capital. On the risk side, lower debt financing costs may help buyout funds. Venture capital risks will increase in a slowing economy. | Reduced preference for equity will make high returns more difficult to achieve in developed countries. However, if their economies are strong, returns in emerging markets could be very attractive. |

Finally, there is one last point to keep in mind. As we have tried to make clear in this article, the future impact of aging on asset class returns is very difficult to forecast at this time. Too many critical uncertainties associated with demographic change are still unresolved, and thus probably have not been fully incorporated into today's asset prices. Over time, however, their future outcomes will become more certain, and will trigger changes in the relative valuations of different asset classes. One could argue, for example, that we may be seeing this already in the case of U.S. real return bonds (TIPS). Because information tends to diffuse unevenly, and be processed slowly (especially when it is at odds with one's current view of the world) by investors sometimes act as a herd, in the future, the emerging reality of aging's impact has the potential to trigger sharp changes in financial markets. Successful investors will be the one's who act ahead of these waves. We hope that the frameworks we have provided (and will continue to update) will help you to do so.

## Product and Strategy Notes

Lifecycle Funds

Recent months have seen the introduction, particularly in the United States, of a large number of age-based funds. These have appeared in both the retirement and college savings markets, and include offerings by many big players (e.g., Vanguard, Fidelity, T. Rowe Price). In essence, the value proposition of these funds is "tell us the year you want to achieve your

goal, and leave the asset allocation to us." In practice, they all operate the same way, moving from a higher risk/higher return asset allocation to a lower risk/lower return asset allocation as their target date approaches.

For example, if you invest in the Vanguard 2045 Target Retirement Fund (VTIVX), your investment will be allocated as follows: 72% to Vanguard's Total (U.S.) Stock Market Index Fund, 13% to its Europe Stock Market Index Fund, 5% to its Pacific Stock Market Index Fund (in other words, 18% to the EAFE index), and 10% to its Total (U.S.) Bond Market Index Fund. Over time, this allocation becomes more conservative. For example, if you invest in the 2015 Target Retirement Fund (VTXVX), 40% of your investment would be allocated to the Total (U.S.) Stock Market Index Fund, 7% to the Europe Index Fund, 3% to the Pacific Index Fund, and 50% to the Total (U.S.) Bond Market Index Fund.

A number of readers have written to ask what we think of these funds. Based on the principle that you should always say something nice first, we like the fact that the Vanguard products use low cost index funds to execute their strategy. However, we also have a few not-so-nice things to say about these products. First, from our perspective they use too few asset classes. In addition to the four they use (U.S. equity, U.S. investment grade bonds, foreign developed markets equity, and U.S. real return bonds in their 2005 fund), why not include foreign currency bonds, commercial property, commodities and emerging markets equity? Doing so would enable investors to achieve an even better risk/return trade-off.

Second, we believe the basic premise of these funds is flawed. As we have repeatedly tried to show in our writing, your asset allocation should be based on much more information than just the date by which you want to achieve a certain goal. The size of the goal, the amount of initial capital, the expected amount of future savings, and multiple risk parameters (e.g., trading off the probability of losing money versus the probability of achieving your goal) also contribute to the minimum required rate of return you need to earn, and therefore to the appropriate asset allocation strategy.

Third, the theory behind the funds implies that investors should place all their assets in them. Doing otherwise would result in the actual asset allocation in the investor's portfolio being different from the one in the fund. Yet the evidence suggests that very few investors have put all their assets in a lifecycle fund. Apparently, the "trust us" pitch isn't working too well.

Finally, because the asset allocation in these funds changes as a function of time (rather than as a function of a reassessment of the multiple factors noted above), it is unclear from their marketing materials what long term rate of return an investor should expect to earn on them. Being curious types, we ran some simulations to explore this issue. We assumed that we wanted to achieve our goal by 2025. We therefore assumed an investment in the Vanguard 2025 Fund. We further assumed that the asset allocation of this fund would change to that of the 2015 fund in year 11, and again change to the allocation used by the 2005 fund in year 18 (35% U.S. equity, 50% U.S. bonds, 15% U.S. real return bonds). For our asset class return assumptions, we used a weighted 67%/33% mix of our historical U.S. real returns (based on the 1/71 to 12/02 period) and 33% our forward looking assumptions (all of this is from our 2003 asset allocation review). Our correlation assumptions were based on the 1994-2003 period.

Based on 10,000 simulations (that is, 10,000 different possible outcomes for 20 years of individual asset class returns), here is what we found. Our investment in the 2025 fund had an expected compound annual real return of 5.1%. The probability that it would not lose any money -- that is, that we would at least get our initial investment back -- was greater than 99%. The probability that we would earn a compound annual real return greater than or equal to 3% was 86%; greater than 5% was 51%; and greater than 7% was 15%. So, to relate this to our model portfolios, what we have here is something that unfavorably compares to our 3% target real return portfolio.

So, does all this mean we are dead-set against lifecycle funds? Not necessarily. There is one circumstance where we strongly support them. Research has also shown the bulk of many investors' retirement savings is in their defined contribution plan (e.g., personal pensions, superannuation funds, 401k or 403b funds, etc., depending on the country where you live). Research has also shown that a large number of participants in defined contribution pension plans chose the default asset allocation option, which usually includes a high percentage of fixed income investments. We think that these investors would greatly benefit if (1) the default option was a lifecycle fund, (2) that used a broad mix of asset classes, and (3) implemented its strategy using index funds.

Private Equity Mutual Funds

Over the last two months, many private equity firms in the United States have announced plans to launch publicly available closed end mutual funds that will enable individual investors to invest in this asset class. What is one to make of these offerings by the likes of KKR, Blackstone, Gleacher, Apollo and Evercore and others?

Let's start with their basic business. The proposed public offerings are coming from leveraged buyout funds, which typically provide equity and large amounts of debt to purchase either private companies or divisions of public companies. These funds earn their profits when the companies they buy are either taken public (via an initial public equity offering) or sold to an operating company (known as a "trade sale"). The managers of these buyout funds typically charge investors annual fees equal to two percent of the assets under management, plus twenty percent of the profits they make.

So why are these funds -- which have historically been available only to wealthy investors and institutions -- all suddenly launching funds aimed at individual investors? Let me count the reasons. First, while the funds raised from wealthy individuals and institutions come with a time limit, the money made available via the closed end mutual funds will live forever (assuming it is not depleted by investment losses and fees paid to the managers). Second, the economics of the buyout business are changing, and not in a good way. While the profitability of the early deals done in the 1980s by the likes of KKR and Forstmann Little are legendary, in recent years the number of funds and the amount of money they manage has dramatically grown. To some extent, the downward pressure on fund returns created by this increase in supply was cushioned by falling interest rates, which expanded the universe of possible deals that could be done. However, with interest rates now rising, those days are over. So what can a good buyout fund manager with an apartment on Park Avenue and a house in the Hamptons do to keep the good times rolling? Lock in funds and lower the cost of equity to be used in buyout deals. And how to do that? By raising funds from individual investors, whose required rate of return is probably lower (due to lack of information and/or perceived scarcity value) than that demanded by more sophisticated wealthy and institutional investors. Voila: a rush of public offerings from previously exclusive private equity firms.

So what returns from an investment in one of these offerings might an individual investor reasonably expect to earn? Historically, a major problem in evaluating the relative attractiveness of private equity as an asset class has been the lack of available and reliable data on its risk and returns. The essence of the problem is that the actual return earned on an investment in a private equity fund isn't known with certainty until the fund is liquidated, usually after ten years. Before then, estimated returns are based on the valuation of the fund's investments (often by its own managers), which is at best a very uncertain science. Two of the most recent studies in this area have overcome this limitation. The results of the first study ("The Cash Flow, Return, and Risk Characteristics of Private Equity, by Ljungquist and Richardson) are based on the actual cash flow data for a sample of 54 buyout and 19 venture capital funds that were raised and liquidated between 1981 and 2001. The study contains a number of very interesting findings:

- The funds' investments were not well diversified. On average, they invested close to forty percent of their capital in a single industry.

- The average private equity fund generated annual returns above those on the domestic equity market (net of fees paid to the fund's managers) of between five and eight percent.

- However, the average return fails to tell the whole story. The returns on the sample of funds had significant negative skewness, with many funds underperforming the domestic equity benchmark, while just a few delivered returns well above it. In short, manager selection is a critical component of successful investing in the private equity asset class.

- The returns earned on most funds did not turn positive until the very end of a fund's life (most were liquidated, and their profits returned to investors, after ten years).

- In essence, the private equity returns earned above those on domestic equity reflected compensation for holding an illiquid investment for ten years, as well as the risk associated with picking a poor investment manager.

- In general, the more money that was raised by private equity funds in any given year (known as the "vintage year" of the fund), the lower the returns earned by private equity funds started that year.

The second study is "Private Equity Performance" by Kaplan and Schoar. It is based on results for a sample of 746 buyout and venture funds provided by Venture Economics, an industry magazine. The sample covers 1980 to 2001 and includes funds which were largely liquidated, and whose performance can therefore be more accurately calculated. Venture capital funds represent 78% of the sample, while buyout funds comprise 22%. It is important to note an important limitation of this data: fund reporting to Venture Economics is voluntary, and roughly half the funds raised do not provide results. However, the funds that report tend to be larger than average, and therefore represent more than half the capital committed to private equity funds. They find that both the average and the median buyout fund underperformed (on a size weighted basis) the S&P 500 during the period they analyzed on a net-returns to the fund investor basis. Moreover, these results are not adjusted for differences in risk. If the buyout funds were riskier than the S&P 500 Index, their relative underperformance would have been worse. A separate paper, "The Price of Diversifiable Risk in Venture Capital and Private Equity" by Jones and Rhodes-Kropf, find that indeed, this is the case: private equity funds have higher estimated returns volatility than the S&P 500. Finally, the Kaplan and Schoar paper notes the spread between the returns earned by the worst and best performing buyout funds is quite large: funds at the 25$^{th}$ percentile earned only 72% as much as the cumulative return on the S&P 500, while those at the 75$^{th}$ percentile earned 103% of its return.

Based all of these considerations, we are not at this time going to add private equity (or, more accurately, closed end mutual funds that invest in buyout deals) to our model portfolios. Instead, we will wait until more performance data becomes available (hopefully the existence of public funds will lead to the creation of a better index) before taking any action.

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 have updated it 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)<br>**1.50%** | Value (IWW)<br>**1.30%** | Value (IWW)<br>**1.30%** | Growth (IWZ)<br>**1.50%** |
| ***Size*** | Small (IWM)<br>**2.40%** | Small (IWM)<br>**2.40%** | Large (IWB)<br>**1.10%** | Large (IWB)<br>**1.10%** |
| ***Style and Size*** | Small Growth (DSG)<br>**2.70%** | Small Value (DSV)<br>**1.40%** | Large Value (ELV)<br>**0.00%** | Large Growth (ELG)<br>**1.20%** |

| ***Economy*** | **Bottoming** | **Strengthening** | **Peaking** | **Weakening** |
|---|---|---|---|---|
| ***Interest Rates*** | **Falling** | **Bottom** | **Rising** | **Peak** |
| ***Sectors*** | Cyclicals (IYC) | Basic Materials (IYM) | Energy (IYE) | Utilities (IDU) |
| | **0.10%** | **-5.40%** | **7.00%** | **1.20%** |
| | Technology (IYW) | Industrials (IYJ) | Staples (IYK) | Financials (IYF) |
| | **-2.80%** | **1.20%** | **7.10%** | **1.80%** |
| ***Bond Mkt*** | High Risk (VWEHX) | Short Maturity (SHY) | Low Risk (TIP) | Long Maturity (TLT) |
| | **-0.40%** | **-0.80%** | **1.00%** | **-2.80%** |

As you can see, the table tells a somewhat confusing story. The good news is that the results for sector and bond market rotation strategies are broadly consistent, and indicate 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. To begin with, 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. Thus we are left to explain the size and style rotation results. And we think we can, with just one word: momentum. 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.

But just maybe this time is different, and the bond market's forecast is wrong. So while this table makes for interesting reading (and even more fascinating cocktail party conversation), it also illustrates our fundamental point -- active management is a very, very difficult game to consistently win.

## 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 28May04** | **Weight** | **Weighted Return** |
|---|---|---|---|
| | In US$ | | In US$ |
| **7% Target Real Return** | *YTD Returns are Nominal* | | |
| *Asset Classes* | | | |
| Real Return Bonds | 1.7% | 0% | **0.0%** |
| U.S. Bonds | -0.4% | 0% | **0.0%** |
| Non-U.S. Bonds | -2.1% | 20% | **-0.4%** |
| Commercial Property | 2.3% | 10% | **0.2%** |
| Commodities | 12.9% | 10% | **1.3%** |
| U.S. Equity | 1.4% | 50% | **0.7%** |
| Foreign Equity (EAFE) | 2.2% | 0% | **0.0%** |
| Emerging Mkt. Equity | -1.5% | 10% | **-0.2%** |
| | | *100%* | **1.7%** |

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| | **YTD 28May04** | **Weight** | **Weighted Return** |
|---|---|---|---|
| | In US$ | | In US$ |
| **6% Target Real Return** | *YTD Returns are Nominal* | | |
| *Asset Classes* | | | |
| Real Return Bonds | 1.7% | 0% | **0.0%** |
| U.S. Bonds | -0.4% | 0% | **0.0%** |
| Non-U.S. Bonds | -2.1% | 20% | **-0.4%** |
| Commercial Property | 2.3% | 10% | **0.2%** |
| Commodities | 12.9% | 10% | **1.3%** |
| U.S. Equity | 1.4% | 45% | **0.6%** |
| Foreign Equity (EAFE) | 2.2% | 5% | **0.1%** |
| Emerging Mkt. Equity | -1.5% | 10% | **-0.2%** |
| | | *100%* | **1.7%** |

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| | YTD 28May04 | Weight | Weighted Return |
|---|---|---|---|
| | In US$ | | In US$ |
| **5% Target Real Return** | *YTD Returns are Nominal* | | |
| *Asset Classes* | | | |
| Real Return Bonds | 1.7% | 0% | **0.0%** |
| U.S. Bonds | -0.4% | 0% | **0.0%** |
| Non-U.S. Bonds | -2.1% | 20% | **-0.4%** |
| Commercial Property | 2.3% | 10% | **0.2%** |
| Commodities | 12.9% | 10% | **1.3%** |
| U.S. Equity | 1.4% | 30% | **0.4%** |
| Foreign Equity (EAFE) | 2.2% | 20% | **0.4%** |
| Emerging Mkt. Equity | -1.5% | 10% | **-0.2%** |
| | | *100%* | **1.8%** |

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| | YTD 28May04 | Weight | Weighted Return |
|---|---|---|---|
| | In US$ | | In US$ |
| **4% Target Real Return** | *YTD Returns are Nominal* | | |
| *Asset Classes* | | | |
| Real Return Bonds | 1.7% | 5% | **0.1%** |
| U.S. Bonds | -0.4% | 35% | **-0.1%** |
| Non-U.S. Bonds | -2.1% | 20% | **-0.4%** |
| Commercial Property | 2.3% | 10% | **0.2%** |
| Commodities | 12.9% | 10% | **1.3%** |
| U.S. Equity | 1.4% | 5% | **0.1%** |
| Foreign Equity (EAFE) | 2.2% | 10% | **0.2%** |
| Emerging Mkt. Equity | -1.5% | 5% | **-0.1%** |
| | | *100%* | **1.3%** |

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| | YTD 28May04 | Weight | Weighted Return |
|---|---|---|---|
| | In US$ | | In US$ |
| **3% Target Real Return** | *YTD Returns are Nominal* | | |
| *Asset Classes* | | | |
| Real Return Bonds | 1.7% | 75% | **1.3%** |
| U.S. Bonds | -0.4% | 0% | **0.0%** |
| Non-U.S. Bonds | -2.1% | 10% | **-0.2%** |
| Commercial Property | 2.3% | 10% | **0.2%** |
| Commodities | 12.9% | 5% | **0.6%** |
| U.S. Equity | 1.4% | 0% | **0.0%** |
| Foreign Equity (EAFE) | 2.2% | 0% | **0.0%** |
| Emerging Mkt. Equity | -1.5% | 0% | **0.0%** |
| | | *100%* | **1.9%** |

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| | YTD 28May04 | Weight | Weighted Return |
|---|---|---|---|
| | In US$ | | In US$ |
| **2% Target Real Return** | *YTD Returns are Nominal* | | |
| *Asset Classes* | | | |
| Real Return Bonds | 1.7% | 85% | **1.4%** |
| U.S. Bonds | -0.4% | 0% | **0.0%** |
| Non-U.S. Bonds | -2.1% | 10% | **-0.2%** |
| Commercial Property | 2.3% | 5% | **0.1%** |
| Commodities | 12.9% | 0% | **0.0%** |
| U.S. Equity | 1.4% | 0% | **0.0%** |
| Foreign Equity (EAFE) | 2.2% | 0% | **0.0%** |
| Emerging Mkt. Equity | -1.5% | 0% | **0.0%** |
| | | *100%* | **1.4%** |