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This Month's Issue: Key Points

This month we take on two challenging questions: what rate of return should we expect equities to deliver in the future? And given this, are equity markets fairly valued today?

Fundamentally, in an efficient market the future return an equity index should reasonably be expected to supply should be equal to the rate of return investors demand in order to hold risky equities. The future return supplied is a function of two factors: the market's current dividend yield (the dividend/price ratio) and the rate at which dividends will grow in the future. The rate demanded by investors is also a function of two variables: the current yield on real return bonds, and the equity market risk premium.

However, we have concluded that the weight of recent research suggests that the supply of and demand for equity market returns are not always in balance, and markets can therefore be over and undervalued. We reviewed this evidence at length in our February, 2004 article, "Has the Death of Efficient Markets Killed Indexing Too?" Since then, other research has been published that reaches the same conclusion. We review two important articles on this subject in this issue.

We also review the research on estimating the key variables in our supply/demand relative valuation model. We find that multifactor productivity growth seems to be the economic measure that most closely corresponds to likely future dividend growth (in real

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terms). We estimate future values for this variable of between 1% and 2% per year. We also find that a reasonable range for the equity risk premium seems to lie between 2.5% and 4.0%, which are below historical realized excess returns (that is, equity market returns less the return on bonds).

We then review how we combine these inputs in the Dividend Discount Model to reach our conclusions about equity market over and undervaluation. After applying this model, we find that under many plausible scenarios, many equity markets appear overvalued. Because the model we use, as well as our estimation of variable input values are both subject to uncertainty, our valuation findings are indicative rather than conclusive. Still, we find them quite disturbing, but generally in line with the conclusions reached in our March Economic Update.

This Month's Letters to the Editor

Should an American citizen invest in a different way than a European citizen, other things equal. If so, why? Wouldn't it be a good idea to "buy the world market", irrespective of your base currency?

There are two parts to the answer. First, as you can see in our writing, we agree that "buying the world market" makes sense, in the sense that investors generally benefit from diversification across multiple asset classes (e.g., domestic and foreign bonds, domestic and foreign commercial property, and domestic, foreign developed market, and emerging markets equity).

However, whether the specific proportions in which these investments are held should differ between investors located in different countries is an interesting, and to some extent, and unresolved question. Let me begin my answer with a distinction we make between investors' "functional currencies." We assume that most of our subscribers are accumulating most of their savings to fund their long-term, post-retirement income and bequest goals. Hence, a potentially important issue is the currency in which these goals are denominated. For example, consider an English banker who lives in Shanghai who intends to retire to Australia. In what currency should he think about his investments? Pounds Sterling?

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Renminbi? Australian Dollars? Our argument is that, since the majority of the liabilities which his savings are intended to fund are denominated in Australian Dollars (because that is where he intends to spend his retirement years), his "functional currency" is A$. Of course, this raises another question: does this matter? Let me present the arguments on both sides of this issue, and then tell you on which side we come down.

The argument that "currency counts" is grounded in the approach we take to deriving the asset class risk and return assumptions that we use in our asset allocation models. Broadly speaking, these can come from two sources: (1) they can be derived from historical data, or (2) they can be derived using a forward looking asset pricing model. Our review of the academic research leads us to conclude that both of these provide independent information, and that the combination of both sources should produce a superior forecast of future risks and returns. However, the historical returns data for non-domestic asset classes (e.g, foreign equity compared to Australian equity) are a function not only of the returns in foreign markets, but also changes in their respective exchange rates versus the Australian dollar. Hence, in this case, the currency in which the returns series are denominated counts (our editor, who has lived all over the world, likes to put it more simply: "If you don't think currency counts, ask an Argentine.")

On the other hand, when we consider the outputs of a forward looking asset pricing model, it is less clear that this is true. At best, we can try to forecast future exchange rate changes using the difference between government bond yields in different currencies. While theoretically correct, research has repeatedly shown that this is a very weak predictor in practice. In point of fact, the foreign exchange markets are so efficient and unpredictable that one can easily argue that the "right" forecasts to use are ones that assume no changes in current exchange rates (i.e., just use the forecast local currency returns, and assume that for a long-term investor, the FX movements will net out to zero). On the other hand, while this argument may make some sense for developed markets, for emerging markets that appear to have more of a structural tendency toward higher inflation than the rest of the world (and hence, toward long-term currency depreciation), it could be a dangerous assumption to use. Hence, we conclude that even in the case of a forward-looking model, it is wise to take currency changes into account.

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Finally, I should also call attention to the article on equally-weighted portfolios in our March issue. This portfolio, is, logically, the ultimate default option for those who have low confidence in anybody's ability to forecast the long-term behavior of a complex adaptive system like the global financial markets.

I am a recent subscriber from France, and firstly, let me say that I find it extremely interesting and thought provoking. I agree with your conclusions re using ETF, indices etc against trying to "beat the market". However, I think it does raise some questions, which no doubt, have already been posed. If all, or even a large proportion of market users, switch to using index funds or similar instruments, then how will the "correct" prices be set in the market place?

Over the years, I have learned that in some areas, there is precious little difference between finance theory and theology. Questions like the "right" equity market risk premium, or the "right" rate of future rate of dividend growth fit into this category, as do the ones you asked. Logically, you are of course correct: if everyone indexed their portfolios, how would "fair" prices be determined?

Our current thinking on this issue can be summarized as follows: (1) Asset returns are a function of both investors' expectations about future changes in naturally uncertain fundamental factors (e.g., interest rates, exchange rates, dividends, growth, etc.) and their expectations about the future behavior of other investors. (2) Because of their diverse cognitive capacities, mixed incentives, and differing access to information, investors' expectations about fundamental and behavioral factors are heterogenous. (3) Under these conditions, it is possible to make superior forecasts, and earn returns above the index, if one either has access to superior information or to a superior model for making sense of publicly and privately available data. (4) However, the conditions that give rise to superior forecasting ability are naturally self-destructive. For example, once it is trade on, the potential value of superior information is impounded in the price of an asset; the assumptions that underlie superior models can be undone by changes in the structure of the real economy; models lose their effectiveness when they are copied by other investors; and technological and regulatory changes make it much more difficult to gain access to valuable superior information. (5)

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These factors give rise to alternating periods when it is relatively easier and relatively more difficult for active investors to make accurate forecasts. The existence of the former state induces some investors to believe that they can make superior profits through active management. The existence of the latter state convinces other investors that, as a general rule, the long-term potential gains from active management aren't worth the extra time, cost, taxes, and uncertainty involved.

I think that this is becoming a more widely accepted view, certainly by practitioners, and more recently by academics. As an example of the former, we cite the increasing frequency with which institutional investors are separating the management of beta (systematic asset class risk and return) from alpha (unsystematic risk and return associated with specific securities). They want to pay as little as possible for diversified exposure to beta risk -- hence their growing use of indexing across multiple asset classes. But at the same time, they are willing to pay higher prices for skill that delivers alpha (e.g., via investment in market neutral hedge funds that theoretically take low or no beta risk). On the academic front, Andrew Lo from MIT and Doyne Farmer from the Santa Fe Institute are probably the two leading advocates of the complex adaptive systems view of financial markets.

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Global Asset Class Returns

YTD 31May05	In USD	In AUD	In CAD	In EURO	In JPY	In GBP
Asset Held						
US Bonds	1.90%	5.21%	6.37%	11.06%	6.82%	6.97%
US Prop.	1.20%	4.51%	5.67%	10.36%	6.12%	6.27%
US Equity	-1.10%	2.21%	3.37%	8.06%	3.82%	3.97%
AUS Bonds	-1.69%	1.63%	2.78%	7.47%	3.23%	3.39%
AUS Prop.	-8.31%	-4.99%	-3.84%	0.85%	-3.39%	-3.24%
AUS Equity	0.30%	3.61%	4.77%	9.46%	5.22%	5.37%
CAN Bonds	-0.28%	3.03%	4.19%	8.88%	4.64%	4.79%
CAN Prop.	0.75%	4.06%	5.21%	9.91%	5.66%	5.82%
CAN Equity	-0.40%	2.91%	4.06%	8.75%	4.51%	4.67%
Euro Bonds	-5.57%	-2.26%	-1.10%	3.59%	-0.65%	-0.50%
Euro Prop.	4.75%	8.06%	9.22%	13.91%	9.67%	9.82%
Euro Equity	-3.43%	-0.12%	1.04%	5.73%	1.49%	1.64%
Japan Bonds	-3.58%	-0.27%	0.89%	5.58%	1.34%	1.49%
Japan Prop.	0.43%	3.75%	4.90%	9.59%	5.35%	5.51%
Japan Equity	-7.33%	-4.01%	-2.86%	1.83%	-2.41%	-2.25%
UK Bonds	-1.81%	1.50%	2.66%	7.35%	3.11%	3.26%
UK Prop.	-3.93%	-0.62%	0.53%	5.22%	0.98%	1.14%
UK Equity	-1.77%	1.55%	2.70%	7.39%	3.15%	3.30%
World Bonds	-1.25%	2.06%	3.22%	7.91%	3.67%	3.82%
World Prop.	0.03%	3.34%	4.49%	9.18%	4.94%	5.10%
World Equity	-1.60%	1.71%	2.87%	7.56%	3.32%	3.47%
Commodities	5.90%	9.21%	10.37%	15.06%	10.82%	10.97%
Hedge Funds	-1.06%	2.25%	3.41%	8.10%	3.86%	4.01%
A$	-3.31%	0.00%	1.15%	5.84%	1.60%	1.76%
C$	-4.47%	-1.15%	0.00%	4.69%	0.45%	0.61%
Euro	-9.16%	-5.84%	-4.69%	0.00%	-4.24%	-4.09%
Yen	-4.92%	-1.60%	-0.45%	4.24%	0.00%	0.16%
UK£	-5.07%	-1.76%	-0.61%	4.09%	-0.16%	0.00%
US$	0.00%	3.31%	4.47%	9.16%	4.92%	5.07%

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Equity and Bond Market Valuation Update

This section is being redesigned to incorporate the new assumptions discussed in this month's feature article. It will appear again next month.

Sector and Style Rotation Watch

The following table shows a number of classic style and sector rotation strategies that attempt to generate above index returns by correctly forecasting turning points in the economy. This table assumes that active investors are trying to earn high returns by investing today in the styles and sectors that will perform best in the next stage of the economic cycle. The logic behind this is as follows: Theoretically, the fair price of an asset (also known as its fundamental value) is equal to the present value of the future cash flows it is expected to produce, discounted at a rate that reflects their relative riskiness. Current economic conditions affect the current cash flow an asset produces. Future economic conditions affect future cash flows and discount rates. Because they are more numerous, expected future cash flows have a much bigger impact on the fundamental value of an asset than do current cash flows. Hence, if an investor is attempting to earn a positive return by purchasing today an asset whose value (and price) will increase in the future, he or she needs to accurately forecast the future value of that asset. To do this, he or she needs to forecast future economic conditions, and their impact on future cash flows and the future discount rate. Moreover, an investor also needs to do this before the majority of other investors reach the same conclusion about the asset's fair value, and through their buying and selling cause its price to adjust to that level (and eliminate the potential excess return).

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, 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. Regularly getting this right is beyond the skills of most investors. In other words, most of us are better off just getting our asset allocations right, and implementing them via index funds rather than trying to earn extra returns by accurately forecasting the ups and

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downs of different sub-segments of the U.S. equity and debt markets. That being said, the highest year-to-date returns in the table give a rough indication of how investors employing different strategies expect the economy to perform in the near future. The highest returns in a given row indicate that most investors are anticipating the economic and interest rate conditions noted at the top of the next column. Similar returns in multiple columns (within the same strategy) indicate a relative lack of agreement between investors about the most likely future state of the economy.

Year-to-Date Returns on Classic Rotation Strategies in the U.S. Markets

Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style Rotation	Growth (IWZ) **-1.74%**	Value (IWW) **0.22%**	Value (IWW) **0.22%**	Growth (IWZ) **-1.74%**
Size Rotation	Small (IWM) **-4.84%**	Small (IWM) **-4.84%**	Large (IWB) **-0.04%**	Large (IWB) **-0.04%**
Style and Size Rotation	Small Growth (DSG) **-1.63%**	Small Value (DSV) **-4.45%**	Large Value (ELV) **-0.25%**	Large Growth (ELG) **-2.57%**
Sector Rotation	Cyclicals (IYC) **-3.68%** Technology (IYW) **-3.32%**	Basic Materials (IYM) **-6.69%** Industrials (IYJ) **-2.95%**	Energy (IYE) **13.07%** Staples (IYK) **0.18%**	Utilities (IDU) **8.40%** Financials (IYF) **-4.05%**
Bond Market Rotation	High Risk (VWEHX) **-0.40%**	Short Maturity (VBISX) **0.70%**	Low Risk (VIPSX) **2.20%**	Long Maturity (VBLTX) **5.70%**

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Are Equity Markets Overvalued Today?

This month, we're going to tackle two difficult questions: what rate of return should we expect equities to deliver in the future? And given this, are equity markets fairly valued today?

Fundamentally, in an efficient market the future return an equity index should reasonably be expected to supply is a function of two factors: its current dividend yield (the dividend/price ratio) and the rate at which dividends will grow in the future. However, simple as it appears, the right way to apply this formula in practice has been the subject of quite a bit of controversy.

Let's start with the equity market dividend yield, which is readily obtained from publications like the *Financial Times* or *The Wall Street Journal* (in their listings of the dividend yields on different market indexes). For example, the following table shows the current dividend yields in different regional equity markets:

Equity Market	Current Dividend Yield
Australia	3.9%
Canada	1.8%
Eurozone	2.9%
Japan	1.2%
United Kingdom	3.3%
United States	1.8%

The key issue here is whether this ratio should be adjusted upward to reflect stock repurchases. Companies can either distribute cash profits to their shareholders, or reinvest them in new projects or acquisitions. Distributions can be made either through the payment of dividends, or by repurchasing some of the company's outstanding shares. For people subject to tax, repurchases are theoretically preferable to dividends when capital gains are taxed at a lower rate than dividend income. The dividend yield may therefore underestimate the actual amount of cash being distributed to shareholders.

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As always, there is also another side to the argument. First, in many markets, corporate share repurchases have been legalized only recently. There is relatively little historical data available from which one can estimate future repurchase volumes.

Second, in those markets where longer data is available (e.g., the United States), the reported volume of repurchases undertaken overstates, perhaps by a substantial amount, the net amount of cash returned to shareholders by this method. The reason is that many repurchases are undertaken to offset the exercise of stock options by company managers and others. For example, a manager may exercise her option to purchase 100 shares of her company at $5 per share (i.e., a total cost of $500). This results in the new issue of 100 shares to the employee. To maintain a constant level of shares outstanding, the company would then repurchase 100 shares in the market. If they are trading at $10, the company would spend $1,000 on the repurchase.

The third argument is that share repurchases are far less predictable than dividends. This was amply demonstrated in a recent paper, "Payout Policy in the 21st Century", by Brav, Graham, Harvey and Michaely. The authors surveyed and interviewed over 400 senior financial executives on the dividends versus repurchase issue. They found that "maintaining the dividend level is a priority on a par with new investment decisions. Managers express a strong desire to avoid dividend cuts, except in extraordinary circumstances." The authors also found that "several factors stand out as influencing repurchase policy…In contrast to decisions about preserving the level of the dividend, managers make repurchase decisions after new investment decisions. Many executives view share repurchases as being more flexible than dividends… 80 percent of CFOs report that the availability of good investment projects is an important factor affecting repurchase decisions… Companies are likely to repurchase when good investments are hard to find, when their stock's float [daily trading volume in their shares] is adequate, and to offset option dilution." For this reason, "managers are hesitant to shift from repurchases to dividends, because [this] cannot be reversed except under extraordinary circumstances."

In light of these arguments, it difficult to simply adjust the current dividend yield upward to account for the future use of share repurchases. Moreover, in those analyses that have done this, there seems to be no consensus on the right adjustment factor to use. We have

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seen estimates ranging from .5% to 1.0%; however, it is not clear whether these account for offsetting new share issues.

Difficult as this issue is, it is far less controversial than the correct rate of future dividend growth to use in an estimate of future equity market returns.

The traditional approach has been to assume that the growth in dividends will match the overall real growth rate in the economy, assuming roughly constant shares of corporate profits in national income, and dividend payouts as a percentage of corporate earnings. Traditionally, the future real growth rate of the economy is estimated using two inputs, expected population growth (as a proxy for total hours worked), and expected labor productivity growth (i.e., change in real output per hour worked).

However, three recent studies have all found that this approach substantially overestimates the actual rate of dividend growth. In their article, "What Risk Premium is Normal?", Bob Arnott and Peter Bernstein find that growth in U.S. equity prices between 1802 and 2001 was much more closely related to growth in per capita GDP, rather than overall GDP. Their explanation for this is the following: "Can't shareholders expect to participate in the growth of the economy? No. Shareholders can expect to participate only in the growth of the enterprises that they are investing in. An important engine for economic growth is the creation of new enterprises. The investor in today's enterprises does not own tomorrow's new enterprises without making a separate investment in them with new capital." In addition, "retained earnings [in the companies owned by shareholders] are often not reinvested [in projects] at a return that rivals externally available investments." The authors conclude that "since growth in real per capita GDP is a measure of the growth of productivity, it would seem that the [dividend growth] that can be sustained in a diversified market portfolio closely matches the growth of productivity in the economy, not the growth of the economy per se." However, Arnott and Bernstein also found that the growth in real dividends (.9%) has not exactly matched the growth in real per capita GDP (1.6%). In fact, it has consistently fallen short of it by .7% per year.

In a more recent paper ("Economic Growth and Equity Returns"), Jay Ritter examined the correlation between real equity returns and real per capita GDP growth in multiple countries between 1900 and 2002. He finds no strong statistical relationship between the two. However, he agrees with Arnott and Bernstein that, "empirically, what matters for stock

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returns is how much of an economy's growth comes from reinvestment of earnings into positive net present value projects in existing publicly traded companies, versus how much of it comes from personal savings that are invested in private companies or in new issues of equity from existing companies."

Finally, Professors Dimson, Marsh, and Staunton from London Business School recently addressed the linkage between economic and dividend growth in their 2005 Global Investment Returns Yearbook. They estimate the following annualized real growth rates between 1900 and 2004:

Country	Dividend Growth Rate	Real Per Capita GDP Growth Rate
Australia	1.2%	1.9%
Canada	0.6%	2.1%
France	-0.4%	2.2%
Germany	-1.7%	1.5%
Japan	-2.9%	3.6%
United Kingdom	0.5%	1.8%
United States	1.0%	2.0%
World*	0.6%	2.2%

* GDP weights to 1968; market capitalization weights thereafter.

Dimson, Marsh and Staunton note that "higher economic growth was not associated with higher real dividend growth…Statistically, we cannot reject the hypothesis that there is no association between past economic growth and future stock market performance." On the other hand, they find that the reverse is not true: in many countries, past stock market returns predict future GDP growth.

When it comes to estimating future equity market returns, is there a way out of this conundrum? We believe there is, and that it starts with a better understanding various measures of productivity growth. Both output per hour and GDP per capita are measures of labor productivity growth. In theory, there are two contributors to labor productivity growth. The first is an increase in the amount of capital per worker. A simple example of this is the amount of output that can be produced by a farmer using only hand tools versus one who

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owns a tractor. Technically, this is called "capital deepening." The second source of labor productivity growth is called either "multifactor productivity growth" (MFP) or "total factor productivity growth" (TFP). In theory, this accounts for intangibles, better ways of organizing production, better labor/management relations, technological changes, and the like. In practice, it is measured as a residual, after subtracting the effect of capital deepening from labor productivity growth.

Unfortunately, there are also a great number of measurement issues associated with MFP, including how to accurately measure capital inputs, how to distinguish between technological improvements that are embodied in capital (e.g., a more efficient machine) and those that are not (e.g., a different chemical forumulation), and how to distinguish between improvements in MFP and the quality of human capital (e.g., due to more years of education, or better schooling methods). An excellent review of these issues is provided in two papers: "How Important are Capital and Total Factor Productivity for Economic Growth?" by Baier, Dwyer, and Tamura; and "Interpreting Productivity Growth in the New Economy: Some Agnostic Notes" by Erich Gundlach. The latter makes the critical point that capital deepening cannot go on forever; in the long-term, labor productivity growth – whether in a country or a company -- must be driven by MFP growth.

As you can see from the following OECD data, growth in MFP is much lower than growth in labor productivity:

Region	**Average MFP Growth, 1981 - 1995**	**Average MFP Growth, 1997 - 2001**
Australia	1.1%	1.5%
Canada	0.2%	1.3%
France	1.7%	1.7%
Germany	1.0%	0.8%
Japan	1.7%	0.4%
United Kingdom	2.2%	0.9%
United States	1.0%	1.1%

As you can see, MFP growth much more closely matches real long-term dividend growth than either labor productivity or real GDP per capita growth.

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So where does this leave us? We began with a model that estimated future equity market returns as the sum of the current dividend yield plus expected long term dividend growth. We have now shown how it can be implemented. This yields the following estimates of future equity market returns, which we compare to those provided by the current market earnings yield method. The first set of estimates makes no adjustment for share repurchases, and assumes 1.0% long-term growth in multifactor productivity.

Region	Dividend Yield	Dividend Growth (MFP Growth)	Expected Equity Market Real Return
Australia	3.9%	1.0%	4.9%
Canada	1.8%	1.0%	2.8%
Eurozone	2.9%	1.0%	3.9%
Japan	1.2%	1.0%	2.2%
United Kingdom	3.3%	1.0%	4.3%
United States	1.8%	1.0%	2.8%

This next set of estimates adds .5% to the dividend yield to account for net repurchases, and raises multifactor productivity growth to a sustained rate of 2.0% per year.

Region	Adjusted Dividend Yield	Dividend Growth (MFP Growth)	Expected Equity Market Real Return
Australia	4.4%	2.0%	6.4%
Canada	2.3%	2.0%	4.3%
Eurozone	3.4%	2.0%	5.4%
Japan	1.7%	2.0%	3.7%
United Kingdom	3.8%	2.0%	5.8%
United States	2.3%	2.0%	4.3%

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So far, we have addressed the future real returns equity markets might be expected to supply. We now turn to the question as to whether these are also the returns that investors require, and what might happen if they are not.

In theory, the real rate of return investors demand from the equity market is equal to the current yield on a long-term risk free real return bond, plus an additional "equity market risk premium" that compensates them for the additional risk born by people who invest in stocks. The former is readily available from the daily newspaper; the real question pertains to the equity market risk premium. If you believe that equity markets are highly efficient, the rate of return that equities are expected to supply will always equal the return that investors demand.

We have concluded that the weight of recent research suggests that this is not an accurate description of reality. We reviewed this evidence at length in our February, 2004 article, "Has the Death of Efficient Markets Killed Indexing Too?" Since then, other research has been published that reaches the same conclusion. One of these is "A Study of Neo-Austrian Economics Using an Artificial Stock Market", by Benink, Gordillo, Pardo, and Stephens. As originally proposed by Friedrich Hayek, the authors note that "markets are continuously evolving from one inefficiency to another, never attaining perfect, efficient equilibrium, yet strongly attracted to it." In this environment, the authors describe how "creative investors track and exploit profit opportunities generated by continuous information shocks [e.g., the introduction of new information into the market] in a never ending cycle…[However], these investors' actions produce signals to other investors, triggering actions that reduce the market's disequilibrium" and move it back towards efficiency. The authors note that while "short term regularities" (that imply predictability) can emerge in this system, they are transitory.

More recently, in his paper "Reconciling Efficient Markets With Behavioral Finance: The Adaptive Markets Hypothesis", Andrew Lo from the Massachusetts Institute of Technology starts with the following assumptions: "(1) Individuals act in their own self interest, make mistakes, and gradually learn and adapt; and (2) Competition drives adaptation, as well as selection pressures [e.g., the exit of the least successful investors from the market, and the flow of assets to the most successful managers]. Lo notes that the key insight of his model, "taken directly from evolutionary biology, is that convergence to equilibrium [i.e.,

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efficiency] is neither guaranteed nor likely to occur at any point in time. The notion that evolving systems must march inexorably towards some ideal stationary state is just plain wrong."

Assuming that markets are not perfectly efficient and continuously in equilibrium, it follows that there could be situations in which the rate of return that an equity market is expected to supply is greater or lesser than the rate of return demanded by investors. Under these circumstances, the most logical adjustment mechanism is equity prices. If the expected supply of equity returns is less than the rate demanded by investors, prices should fall (which would cause a rise in the dividend/price ratio). If the expected supply of equity returns is greater than the rate demanded by investors, prices should rise, causing the dividend yield to fall.

So, with this in mind, let us now take a more in-depth view of the real rate of return that investors should demand on their investment in a broad equity market index. As previously noted, this return is composed of two parts: the yield on real return government bonds, and an equity market risk premium.

While the current real bond return can be obtained from the paper, there is an issue as to whether this is the correct one to use. The real risk free rate of interest is one of the most important yet least understood variables in all finance and economics. It plays a critical role not only in investments (as the foundation upon which bond yield curves and required equity market returns are built), but also in monetary policy, where the gap between the normal (or, "natural") and actual real risk free rate is an important indicator (see, for example, "The Real Interest Rate Gap as an Inflation Indicator" by Neiss and Nelson, "Measuring the Natural Rate of Interest" by Laubach and Williams, and "The Real Interest Rate and Monetary Policy" by Magnus Jonsson).

In theory, the normal risk free rate is a function of three factors. The first is investors' time preference – that is, the return they require to forego consumption today (by saving) in order to consume more in the future. The more impatient ("I want it now!") people are, the higher the rate of interest they will require to defer current consumption. While usually roughly estimated at between 1% and 3%, this rate tends not to be constant, varying not only between different situations, but also over time (see, for example, "Valuing the Future" by Pearce, Groom, Hepburn, and Koundouri, "Discount Rates for Time Versus Dates" by Robyn

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LeBoeuf; "Time Discounting and Time Preference" by Frederick, Loewenstein, and O'Donoghue; and "Lifecycle Changes in the Rate of Time Preference" by David Bishai).

The second factor that contributes to the real risk free rate is the rate at which productivity (generally taken to mean MFP) is increasing in the economy. As this increases, so too does the productivity of capital, and the rate of return companies can pay to people to induce them to save more (and thereby provide the funds needed for new business investments).

The third factor that drives the risk free rate is investors' average degree of risk aversion. As this increases, people hold larger precautionary savings. All else being equal, this increase in savings will tend to reduce real interest rates.

Mathematically, the simple formula for the natural risk free rate of interest (there are more complicated ones) equals (Time Discount Rate + MFP Growth Rate) x (1/Risk Aversion Factor). So, for example, a Time Discount Rate of 2%, expected MFP Growth of 1.5%, and a Risk Aversion Factor of 2 (technically, that's Constant Relative Risk Aversion) results in a real risk free rate of 1.75% -- not that different from the current 1.62% on risk free real return bonds in the United States.

However, the current real rate is low by historical standards; between 1963 and 2003, it averaged 2.9%. What might account for this? Since the Risk Aversion Factor we assume is already low, the change must have been in the other two factors. For example, if we assume more impatient consumers (say, a Time Discount Rate of 3%), and a higher expected rate of MFP growth (say, 2.5%), we get a real risk free rate of 2.75%.

However, since both the variables in this model and their estimated values are still somewhat controversial, we have decided to use the current yield on real return government bonds in our valuation methodology. Today, those yields are as follows:

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Region	Current Real Bond Yield
Australia	2.60%
Canada	1.79%
Eurozone	1.36%
Japan	0.29%
United Kingdom	1.63%
United States	1.62%

Let's now move on to one of the most contentious issues in finance, the debate over the "right" equity risk premium to use. Traditionally, the most common approach to estimating the equity risk premium was to look at average historical rates of return on equity and government bonds, and use the difference between them as the equity risk premium. The following table contains historical estimates of equity risk premia, from the Global Investment Returns Yearbook by Dimson, Marsh and Staunton:

Country or Region	1900 – 2000 ERP Estimate*
Australia	6.2%
Canada	4.1%
France	3.7%
Germany	5.2%
Japan	5.6%
United Kingdom	4.0%
United States	4.6%
World Index	4.0%

* Geometric Average

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However, in recent years the historical approach to estimating the equity risk premium (ERP) has been questioned by many respected academic researchers. They have concluded that there is often a big difference between the returns people reasonably expect to receive when they make an investment (the "ex-ante" ERP), and the returns they actually receive (the "ex-post" ERP). In other words, historical, or realized rates of return on equities (and the difference between these returns and the returns on government bonds) may be very poor estimates of what people actually were thinking when they made these investments. These doubts have been reflected in a large number of academic papers. The following table presents the key conclusions from a number of these studies:

Study and Authors	**Equity Risk Premium Estimate (Over Bonds)**
Merrill Lynch Survey of Fund Managers, May, 2002	3.8% for world ERP
"Estimating the Equity Risk Premium", by O'Hanlon and Steele	4% to 5% in U.K.
"The Shrinking Equity Premium" by Jeremy Siegel	1.5% to 2.5% in U.S.
"An Ex-Ante Examination of the Equity Premium" by Glen Donaldson et al	3.5% in U.S.
"New Estimates of the Equity Risk Premium" by Douglas Lamdin	3.1% in U.S.
"The Declining U.S. Equity Premium" by Ravi Jagannathan et al	0.7% after 1970 in U.S.
"The Equity Premium" by Eugene Fama and Kenneth French	2.55% for 1951 to 2000 in U.S.
"What Risk Premium is Normal?" by Robert Arnott and Peter Bernstein	2.4% in U.S. from 1810 to 2001

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Study and Authors	**Equity Risk Premium Estimate (Over Bonds)**
"Estimating the Market Risk Premium" by Scott Mayfield (a very impressive study that relates the equity risk premium to market volatility, using a regime switching model)	4.1% in U.S.
2005 Global Investment Returns Yearbook, by Dimson, Marsh and Staunton	5% over Short Term Government Debt (roughly 3.5% over bonds)
"The Market Equity Risk Premium" a very comprehensive review of multiple studies published in May, 2005 by the New Zealand Treasury	3% to 5% range; 4% estimate.

As you can see, the majority of these studies find that the forward looking equity risk premium should be lower than realized historical excess returns over real return bonds. There is, however, a dissenting view. In two recently published papers ("A Unified Bayesian Theory of Equity 'Puzzles"" by Martin Weitzman, and "A Bayesian Solution to the Equity Premium Puzzle" by Jobert, Platania, and Rogers), the authors start with a mystery: why has the historical volatility of equity market returns (and excess returns over real return bonds) been so much higher than the underlying volatility in the real growth rate of the economy or personal consumption spending? They conclude that, when investor uncertainty about the equity returns generating process is taken into account (as evidenced by our previous discussion), the historical equity market premium is in line with reasonable investor expectations.

In addition, studies have found that the expected equity risk premium tends to rise and fall over time, decreasing when a string of recent market gains reduces people's perception of risk, but rising again when recent market losses brings equities' relative riskiness back into focus. However, as Goyal and Welch conclude in their paper, "A Comprehensive Look at the Empirical Performance of Equity Premium Prediction", there appears to be no reliable indicator that can be used to predict in advance these apparent changes in investors' average equity risk premium.

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Given this range of views, we have decided to use two different estimates of the Equity Risk Premium: 2.5% and 4.0%.

This brings us to our revised equity market valuation update, which we will use from now on. It will continue to be based on a comparison between the future real returns the equity market is expected to supply, and the real return on equity that investors demand. Our approach is based on what is known as either the Dividend Discount Model or the Gordon Growth Model. This says that the fair value of an equity is equal to the present value of the dividend it pays (technically, the present value of the dividend in the next period), discounted at the required rate of return (the real bond yield plus the equity risk premium) less than expected dividend growth rate.

We set the current value of each equity market equal to 100. We then use the Dividend Discount Model to estimate the fair value of the equity market. We do this using different combinations of our high and low scenarios for the future supply of return, and our high and low scenarios for investors required rate of return. We divide 100 by the result of each of these calculations. If this ratio is less than 100, our valuation estimate suggests (but, given the uncertainty in the variable input values does not conclusively prove) that the equity market is undervalued. If the ratio is greater than 100, it suggests that the market is overvalued.

For example, consider one possible scenario for Australia. One of its assumptions is that the equity market will supply relatively high returns in the future. In this case, the current dividend yield of 3.9% is adjusted upwards by .5% to account for future share repurchases. Future multifactor productivity growth is assumed to be 2.0% per year. The average annual return equity market is expected to supply is therefore 6.4%. Another assumption under this scenario is that equity market investors will demand relatively high returns. In this case, a 4% equity market risk premium is added to the current real bond yield of 2.60% to arrive at our estimated required rate of return of 6.60%. As you can see, the required rate of return exceeds the rate the market is expected to supply by .20%. This translates into a 4% overvaluation, which is expressed as 104% in the table below.

Here are the complete results of our new equity market valuation estimates:

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Australia	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	70%	104%
Low Supplied Return	105%	144%

Canada	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	97%	160%
Low Supplied Return	178%	259%

Eurozone	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	53%	96%
Low Supplied Return	96%	147%

Japan	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	47%	136%
Low Supplied Return	154%	284%

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United Kingdom	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	55%	93%
Low Supplied Return	94%	139%

United States	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	92%	158%
Low Supplied Return	176%	261%

The conclusion of this analysis is obvious, if painful. Under most assumptions about the future supply of equity returns and the returns investors demand, many equity markets appear overvalued today. Only if one assumes a sharp and sustained increase in future multifactor productivity growth to 2.0% per year, and a sustained equity risk premium of 2.5% is this not the case. However, a final word of caution about this conclusion is also in order. Clearly, the Dividend Discount Model is not the only one that could be used to estimate the fair value of an equity market. Moreover, while it has the virtue of simplicity, it is not without its flaws. For example, it is a steady state model, that does not attempt to adjust for short-term business cycle effects. Last but not least, in addition to model uncertainty, our conclusions are also inevitably affected by estimation errors in the model's four key variables. Therefore, while they are certainly indicative, our valuation conclusions can never be conclusive on the question of whether equity markets are fairly valued today.

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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

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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 tables show how asset allocations with different target compound annual rate of return objectives have performed year-to-date:

	YTD 31May05	**Weight**	**Weighted Return**
	In US$		In US$
7% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	2.2%	0%	**0.0%**
U.S. Bonds	1.9%	0%	**0.0%**
Non-U.S. Bonds	-4.4%	20%	**-0.9%**
Commercial Property	1.2%	10%	**0.1%**
Commodities	5.9%	10%	**0.6%**
U.S. Equity	-1.1%	50%	**-0.6%**
Foreign Equity (EAFE)	-2.5%	0%	**0.0%**
Emerging Mkt. Equity	1.8%	10%	**0.2%**
		100%	**-0.5%**

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	YTD 31May05	**Weight**	**Weighted Return**
	In US$		In US$
6% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	2.2%	0%	**0.0%**
U.S. Bonds	1.9%	0%	**0.0%**
Non-U.S. Bonds	-4.4%	20%	**-0.9%**
Commercial Property	1.2%	10%	**0.1%**
Commodities	5.9%	10%	**0.6%**
U.S. Equity	-1.1%	45%	**-0.5%**
Foreign Equity (EAFE)	-2.5%	5%	**-0.1%**
Emerging Mkt. Equity	1.8%	10%	**0.2%**
		100%	**-0.6%**

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	YTD 31May05	Weight	Weighted Return
	In US$		In US$
5% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	2.2%	0%	**0.0%**
U.S. Bonds	1.9%	0%	**0.0%**
Non-U.S. Bonds	-4.4%	20%	**-0.9%**
Commercial Property	1.2%	10%	**0.1%**
Commodities	5.9%	10%	**0.6%**
U.S. Equity	-1.1%	30%	**-0.3%**
Foreign Equity (EAFE)	-2.5%	20%	**-0.5%**
Emerging Mkt. Equity	1.8%	10%	**0.2%**
		100%	**-0.8%**

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	YTD 31May05	Weight	Weighted Return
	In US$		In US$
4% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	2.2%	5%	**0.1%**
U.S. Bonds	1.9%	35%	**0.7%**
Non-U.S. Bonds	-4.4%	20%	**-0.9%**
Commercial Property	1.2%	10%	**0.1%**
Commodities	5.9%	10%	**0.6%**
U.S. Equity	-1.1%	5%	**-0.1%**
Foreign Equity (EAFE)	-2.5%	10%	**-0.3%**
Emerging Mkt. Equity	1.8%	5%	**0.1%**
		100%	**0.4%**

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	YTD 31May05	Weight	Weighted Return
	In US$		In US$
3% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	2.2%	75%	**1.7%**
U.S. Bonds	1.9%	0%	**0.0%**
Non-U.S. Bonds	-4.4%	10%	**-0.4%**
Commercial Property	1.2%	10%	**0.1%**
Commodities	5.9%	5%	**0.3%**
U.S. Equity	-1.1%	0%	**0.0%**
Foreign Equity (EAFE)	-2.5%	0%	**0.0%**
Emerging Mkt. Equity	1.8%	0%	**0.0%**
		100%	**1.6%**

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	YTD 31May05	Weight	Weighted Return
	In US$		In US$
2% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	2.2%	85%	**1.9%**
U.S. Bonds	1.9%	0%	**0.0%**
Non-U.S. Bonds	-4.4%	10%	**-0.4%**
Commercial Property	1.2%	5%	**0.1%**
Commodities	5.9%	0%	**0.0%**
U.S. Equity	-1.1%	0%	**0.0%**
Foreign Equity (EAFE)	-2.5%	0%	**0.0%**
Emerging Mkt. Equity	1.8%	0%	**0.0%**
		100%	**1.5%**

This year, we are also introducing two new benchmarks that can be used to evaluate the returns on our model portfolios. The first is the return on holding all of one's assets in cash. We define this return as the yield to maturity on a one-year government security purchased at the end of the previous year. For 2005, the U.S. cash benchmark return is 2.75% (nominal).

The second benchmark is a portfolio that is equally allocated to all of the asset classes we use in our other model portfolios. This benchmark portfolio implicitly assumes that it is impossible to accurately forecast future asset class risk and return. Consequently, the best approach is to equally divide one's exposure to different sources of return (and risk). While we disagree with this assumption, intellectual honesty compels us to include this "couch potato" portfolio as one of our benchmarks.

	YTD 31May05	**Weight**	**Weighted Return**
	In US$		In US$
Equally Weighted	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	2.2%	12.5%	**0.3%**
U.S. Bonds	1.9%	12.5%	**0.2%**
Non-U.S. Bonds	-4.4%	12.5%	**-0.6%**
Commercial Property	1.2%	12.5%	**0.2%**
Commodities	5.9%	12.5%	**0.7%**
U.S. Equity	-1.1%	12.5%	**-0.1%**
Foreign Equity (EAFE)	-2.5%	12.5%	**-0.3%**
Emerging Mkt. Equity	1.8%	12.5%	**0.2%**
		100%	**0.6%**

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