Retired Investor

Invest Wisely…Get an Impartial Second Opinion.

Contents

This Month's Issue: Key Points

This month's first feature article is our semi-annual economic update. Our frame of reference is complex adaptive systems theory, in which a system can be operating in a stable, adaptive, or chaotic region, depending on the amount of tension exhibited by key variables. Our thesis is that many of these variables are at levels that have pushed the global political-economic-financial system into the adaptive region. It is also our thesis that many of these variables are approaching their next critical threshold, which could push the system into the chaotic zone. At the domestic level, these variables include the unresolved conflicts between "tax payers and tax eaters" in Western developed countries, between the old and new guard in Japan, between growth and stability in China, and between young, rapidly growing populations and inflexible political and religious structures in the Arab world. At the international level, critical tensions include the response to the United States' dominant power, the emergence of China, severely unbalanced world demand growth, and the continuing financial ramifications of the 1990s technology shock. We present three scenarios: our most likely (muddle along for a while longer with no severe disruptions), our most dangerous (a sharp fall in the dollar), and a wild card (emergence of H5N1 as a severe influenza pandemic). Each scenario contains

ISSN 1554-5067

implications for asset class returns. We conclude that since our last economic update, the probabilities have increased that our most dangerous scenario (or something similar to it) will occur. As noted in one of this month's letters to the editor, we are not ideologues on the subject of market timing. While we do not believe that it is possible for most mortals to consistently high risk adjusted returns by "timing the market", we also think that on some occasions, prudent risk management may require departures from one's long-term asset allocation policy. This month's economic analysis indicates that we may be approaching this point. The problem, however, is that we're not sure whether this is more like March, 1998 (when a lot of people began to think that the U.S. equity market was significantly overvalued) or March 2000 (when a lot of those people, after wrongly betting against the market for too long, threw in the towel, just as their view was about to be proved right). Such is life in a complex adaptive system with rising tensions and investors who are cognitively limited, facing mixed incentives, and not always rational.

We continue to believe in the long-term advantages of a well-diversified index portfolio that can weather the storms of deflation and inflation, as well as sail at a good speed in normal times. That being said, a lot of asset classes, particularly equity, commercial property, and riskier debt, are looking quite overvalued today, which is not a good thing given what seems to lie ahead for the global economy. Moreover, if one looks at this month's Global Asset Class Returns matrix, it is clear that many asset classes have begun to experience negative year-to-date returns. It therefore seems clear that this is an appropriate time to rebalance one's portfolio, and to reset the weights of equity asset classes at a level five to ten percent below their long-term target. The best choice for the resulting overweights would seem to be real return bonds, foreign currency bonds (if you are a U.S. dollar based investor), shorter term government bonds, or perhaps to implement a tilt toward gold or timber in commodities. In addition, if one's domestic bond allocation is tilted to longer maturities or high risk issues, now would be an excellent time to consider a move to a shorter maturity, lower risk tilt.

Also in this issue, we examine arguments that have been raised against commodity index funds. We find that for most investors, these funds still make sense. We also analyze the arguments in favor of equally weighted asset class portfolios, and review their historical

ISSN 1554-5067

performance. Across our six currency regions, we find that, on average, it is roughly equal to that of our 5% real return target portfolios.

This Month's Letters to the Editor

What is your view on market timing, particularly today, when some asset classes seem very overvalued?

We have repeatedly noted in our writing that experience has taught us the folly of being ideologues when it comes to market timing. Rather, we distinguish between the goal one is pursuing in trying to time markets, and the way one goes about it.

Conceptually, some people try to time markets because they are trying to earn higher returns, while others are trying to limit their risk. The former is heavily dependent on foresight about the relative returns an investor expects different asset classes to earn in the future. The latter is based on hindsight -- the current valuation of an asset class relative to the historical record. In our experience, hindsight tends to be more accurate than foresight; hence, we believe that most investors should limit their market timing to avoidance of extreme overvaluations.

There are also different ways to implement a market timing approach. We broadly categorize these as "episodic" and "systematic." The former are conscious decisions, often involving significant portfolio allocations, based on specific valuation conclusions (based on either foresight or hindsight). The latter are mechanical decisions, whose goal is to exploit financial markets' tendencies to over-react and then correct. For example, a decision to invest in equity index funds contains an element of momentum, in so far as the index fund uses market capitalization weighting that buys more shares as they rise in price. In contrast, a regular rebalancing strategy systematically sells recent winners and reallocates the proceeds to other asset classes that have not performed as well (i.e., it reduces holdings in asset classes above their target weights, while adding to those below their target weights). Employing dollar cost averaging is another example of a systematic approach to risk reduction.

Let's look more closely at episodic market timing based on hindsight-based conclusions about the reasonableness of current valuations in one or more asset classes. As

  ISSN 1554-5067

you can see from our writing (e.g., our March 2000 issue), we clearly believe that markets sometimes can and do become substantially and visibly overvalued, and that short-term departures from long-term asset allocations are warranted (for risk management purposes) under these circumstances. Another example we like to cite (since we lived through it) is the overvaluation of the UK pound in 1992. However, we should also point out that in both cases, right up until the end, there were loud voices arguing that there was no overvaluation. In other words, one can never be completely sure that one's valuation conclusions are correct; as with other aspects of investing, there is always an irreducible level of uncertainty involved.

To help readers identify these situations, each month we produce our bond and equity market valuation updates, and twice each year we produce our economic update with its implications for future asset class returns.

Finally, what is one to do when one concludes that an asset class is substantially overvalued? If one is already invested, one confronts a range of possible hedging approaches, including the purchase of index put options, and switching into either cash or another asset class (preferably one that appears relatively undervalued). Neither approach is without associated costs (which will also depend on whether the assets in question are held in taxable or tax-advantaged accounts). Hence, as anyone who purchased U.S. equity index puts from 1998 onward can tell you, one needs to balance these potential costs against the likely gains (as anyone who either ran out of money or threw in the towel and stopped buying puts at the end of 1999 can also tell you).

On the other hand, if one is not yet in the overvalued asset class, one can remain in one's current asset allocation, switch some assets into cash, or adopt a dollar-cost averaging approach. In some cases, one might alternatively employ a tilt to limit one's risk -- e.g., moving into nominal return bonds using short maturities. Unfortunately, there is no right or wrong answer about the best approach to employ -- it really comes down to the interplay of one's individual risk preferences and the extent of perceived overvaluation in the asset class (or classes) in question.

There is, however, one practice we've seen and used that we invariably find helpful: before making a decision, write down the logic behind it -- e.g., the key pieced of information and the arguments made with them to reach the conclusion that is the basis for the action. Inevitably, looking backward from the future, one will realize that one's decision wasn't

ISSN 1554-5067

perfect; however, being able to look back on a contemporaneous record of why it was made dramatically limits one's tendency to agonize over "what might have been" (while also helping to improve our decision making skills). We cannot hope to be right all the time; all we can do is to strive to make reasonable decisions in light of the information available to us when the decision was made.

I have conservative post-retirement goals, but I still don't understand why I should have a high percentage of my portfolio in real return bonds instead of stocks. Please explain.

As you know, we assume that retirees are trying to maximize the probability of achieving a real (inflation adjusted) income (withdrawal) and, in some cases, a real bequest goal over a specified time frame (remaining years of life), in the face of uncertainty about future asset class returns, and some constraints on how much they can prudently allocate to certain asset classes (e.g., a maximum of 10% to emerging markets equities). From a mathematical point of view, this is a very hard problem to solve exactly, absent a supercomputer. For this reason, we approach it using simulation optimization, in which we search over a landscape of different asset allocation and rebalancing strategies looking for the "highest peak" -- that is, a solution that is "robust" enough to have a high probability of achieving the stated goals, under a wide variety of future asset class return scenarios.

The future accuracy of these solutions (which we can know only in hindsight) depends on the estimated returns, risks, and correlations we use for the different asset classes. In our writing, we have noted how we derive them from a weighted combination of historical data and the outputs from forward looking asset pricing models. We believe (based on our reading of the available research) that there is great merit in this approach, as both historical data and the pricing models contain valuable information. We also note that there is significant uncertainty in both of these: in the case of the historical data, it takes the form of estimation error (i.e., the extent to which inputs derived from our historical data sample deviate from "true" underlying returns generating process). In the case of the latter, it takes the form of model error (i.e., the chance we are using the wrong model to describe the "true" returns generating process). In sum, we are trying to make our best estimate of the right solution to a very difficult problem under conditions of significant uncertainty.

ISSN 1554-5067

This brings me to your specific asset allocation. The inputs you used are, in essence, those for a 4% real return annuity with a 50 year life. To maximize the probability of achieving this goal under a wide variety of possible future scenarios, our trades-off the extra real returns a portfolio might might earn on certain asset classes, against the additional risk (volatility of returns) it would have to take on to obtain them. For example, consider a portfolio that had 50% in U.S. equity, and 50% in U.S. nominal return bonds. One possible asset return scenario would be for sharp negative returns in both these asset classes early in the holding period. This might be due to a sharp increase in U.S. inflation. Moreover, in order to achieve your real income target, you would be making much larger withdrawals (in nominal terms) from your portfolio at the very time it had suffered negative returns and lost value. As we like to say, this is what the "return versus volatility tradeoff" looks (and feels) like in the real world, as opposed to on a computer screen. Obviously, under this scenario, the probability of achieving a 50 year income target is significantly (and perhaps substantially) reduced. Hence, it is a scenario we dearly want to avoid.

Our model attempts to achieve this objective by making a substantial allocation to real return bonds, whose total real returns do not depend on changes in inflation. The model also gains additional expected return (with little risk penalty) via allocations to foreign currency bonds, commercial property, and commodities. Under a wide range of future asset class return scenarios (generated from our input assumptions), this allocation maximizes the probability of achieving the specified 4% real income (withdrawal) goal over the 50 year time period. (I should also make the important point that there are some important tax issues involved with real return bonds, particularly if they are held outside a tax-advantaged account. In this case, the distinction between TIPS and Series-I Savings Bonds is important, and professional tax advice is very useful).

Is there room for disagreement over these allocations? Of course there is -- as I noted, there is unavoidable uncertainty regarding the input assumptions we use for different asset classes. Might one therefore want to allocate some portion of one's portfolio to some combination of equity asset classes? Perhaps, if one used different input assumptions. The long and the short of it is that there is no single "right" answer to this problem. Our goal is to help subscribers approach it logically, and understand how asset allocation and rebalancing

ISSN 1554-5067

decisions are likely to affect the probability of achieving one's post-retirement investment goals.

Why don't you include MITTS in your recommended index funds?

MITTS are debt securities issued by Merrill Lynch, whose return is tied to some type of equity index. They are a subset of a broader class of instruments known as "equity linked notes." While each of these typically has a somewhat different structure, the general structure is that of an intermediate term debt security whose return is equal to the positive percentage change in the value of an equity index, less some amount.

Some investors find these ELNs to be attractive, because they provide principal protection (assuming no default by the issuer), and some upside participation in the appreciation of an equity index. We are considerably less enthusiastic about them, for two reasons. First, the basic structure of an ELN can, to some extent, be replicated by an investor if he or she is so inclined. In principal, an ELN is nothing more than a bundled combination of a zero coupon bond and a call option on an equity index (with both having the same maturities). The wrinkle with equity linked notes is that they typically have a longer maturity than the longest dated traded call option on the equity index they use. This creates potential for the mispricing of the equity option that is embedded in the ELN. Specifically, it is hard for most investors to tell whether the percentage that is deducted from the percentage return on the equity index (under most ELN structures) represents fair compensation for the option. Second, ELNs encourage investors to think about risk and return issues at the level of an individual security, rather than at the level of their portfolio. For example, the same risk reduction benefit that is provided by an ELN can be achieved (more cheaply) by varying an investor's portfolio allocation to various asset classes (e.g., bonds and equity).

ISSN 1554-5067

Reader Forum: Follow Up on Last Month's Consumer Reports Article

This month we introduce a new feature: a forum where we will post selected reader commentary on articles we have published. We recently received the following email from a subscriber. We think it provides further perspective on the challenges of active management, specifically identifying mutual funds that will outperform in the future.

"In 2001, Consumer Reports recommended 84 general equity mutual funds. I eliminated all "other" fund categories as you did in your February review. The 2002 mutual fund issue recommended a total of 75 funds. Of those 75, only 21 funds had appeared in the 2001 evaluation. Seventy-five percent of the funds they recommended the previous year had fallen out. Only 10 of 75 funds from their 2002 report showed up in 2003; only 11 of the 34 funds recommended in 2003 made it to the 2004 recommendations; and only 8 of the 59 funds recommended in 2004 were included in their most recent recommendations. How does one develop a logical long-term investment strategy based on the above? It seems the constant pursuit of the "best" performing funds is a loser's game. As you clearly point out in your article, you can't evaluate mutual funds like you do automobiles and washing machines. The seemingly random nature of equity movements requires a totally different approach."

ISSN 1554-5067

Global Asset Class Returns

YTD 31Mar05	In USD	In AUD	In CAD	In EURO	In JPY	In GBP
Asset Held						
US Bonds	-0.50%	0.84%	0.47%	4.15%	3.92%	1.03%
US Prop.	-7.30%	-5.96%	-6.33%	-2.65%	-2.88%	-5.77%
US Equity	-2.40%	-1.06%	-1.43%	2.25%	2.02%	-0.87%
AUS Bonds	-4.51%	-3.17%	-3.54%	0.14%	-0.09%	-2.98%
AUS Prop.	-6.01%	-4.67%	-5.04%	-1.36%	-1.59%	-4.48%
AUS Equity	1.56%	2.89%	2.53%	6.21%	5.97%	3.08%
CAN Bonds	0.16%	1.50%	1.13%	4.81%	4.58%	1.69%
CAN Prop.	-0.81%	0.53%	0.16%	3.84%	3.61%	0.72%
CAN Equity	3.24%	4.58%	4.21%	7.89%	7.65%	4.76%
Euro Bonds	-3.16%	-1.82%	-2.19%	1.49%	1.26%	-1.63%
Euro Prop.	-7.83%	-6.49%	-6.86%	-3.18%	-3.41%	-6.30%
Euro Equity	-0.41%	0.92%	0.56%	4.24%	4.00%	1.11%
Japan Bonds	-3.37%	-2.03%	-2.40%	1.28%	1.05%	-1.84%
Japan Prop.	1.68%	3.02%	2.65%	6.33%	6.10%	3.21%
Japan Equity	-3.94%	-2.60%	-2.97%	0.71%	0.48%	-2.41%
UK Bonds	-1.43%	-0.09%	-0.46%	3.22%	2.99%	0.10%
UK Prop.	-7.12%	-5.78%	-6.15%	-2.47%	-2.71%	-5.60%
UK Equity	0.22%	1.56%	1.19%	4.87%	4.64%	1.75%
World Bonds	-1.90%	-0.56%	-0.93%	2.75%	2.52%	-0.37%
World Prop.	-5.60%	-4.26%	-4.63%	-0.95%	-1.18%	-4.07%
World Equity	-1.25%	0.09%	-0.28%	3.40%	3.17%	0.28%
Commodities	11.20%	12.54%	12.17%	15.85%	15.62%	12.73%
Hedge Funds	-0.48%	0.86%	0.49%	4.17%	3.94%	1.05%
A$	-1.34%	0.00%	-0.37%	3.31%	3.08%	0.19%
C$	-0.97%	0.37%	0.00%	3.68%	3.45%	0.56%
Euro	-4.65%	-3.31%	-3.68%	0.00%	-0.23%	-3.12%
Yen	-4.42%	-3.08%	-3.45%	0.23%	0.00%	-2.89%
UK£	-1.53%	-0.19%	-0.56%	3.12%	2.89%	0.00%
US$	0.00%	1.34%	0.97%	4.65%	4.42%	1.53%

ISSN 1554-5067

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. Because future growth rates are uncertain, 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	2.81%	4.00%	6.81%	4.90%	3.67%	8.57%
Canada	2.00%	4.00%	6.00%	2.10%	1.77%	3.87%
Eurozone	1.53%	4.00%	5.53%	2.50%	2.70%	5.20%
Japan	0.37%	4.00%	4.37%	2.80%	1.00%	3.80%
U.K.	1.71%	4.00%	5.71%	2.50%	3.10%	5.60%
U.S.A.	1.73%	4.00%	5.73%	4.50%	1.70%	6.20%

*High Productivity Growth Scenario..

*** 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[1]	Current Index Value	Current to Implied Value Under High Growth Scenario[2]	Current to Implied Value Under Low Growth Scenario
Australia	192.45	100.00	52%	79%
Canada	45.35	100.00	221%	277%
Eurozone	89.02	100.00	112%	168%
Japan	63.57	100.00	157%	257%
U.K.	96.60	100.00	104%	152%
U.S.A.	137.76	100.00	73%	131%

[1]High productivity growth scenario. [2]Values below 100% indicate undervaluation; more than 100% indicates overvaluation

ISSN 1554-5067

Our valuation estimate is based on the relationship between the returns an equity market is expected to supply, and those investors are likely to demand. The rate of return the equity market is expected to supply in the future equals current dividend yield plus the expected rate of real long-term economic growth. We use two different growth scenarios, based on relatively higher and lower rates of productivity growth in the future. Also, it should be noted that there is increasing evidence that dividend growth rates for public companies tend to be lower than overall economic growth, due to the fact that the fastest growing companies are often smaller and privately owned. Hence, our valuation estimates are rough ones at best. Changes in the market price/dividend (or price/earnings) ratio also affect the returns supplied. However, because this is driven by psychological factors which we have no basis for predicting, we do not include future price/dividend ratio changes in our analysis.

We define the future equity market return that investors demand to be equal to the current yield on long term real return bonds, plus a four percent long-term equity market risk premium. This risk premium is consistent with historical long-term global equity market returns data. 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, if you assume that an equity market is currently in equilibrium (that is, neither under or overvalued), by assuming a value for one of these variables, 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.

While we do not believe that financial markets are always in equilibrium, we do believe that they are strongly attracted to it. Hence, these estimates provide a further perspective on the reasonableness of current equity market valuation levels. These estimates are shown in the following table:

  ISSN 1554-5067

	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	3.67%	2.81%	3.14%	4.76%	5.76%
Canada	1.77%	2.00%	4.23%	0.87%	1.87%
Eurozone	2.70%	1.53%	2.83%	2.17%	3.67%
Japan	1.00%	0.37%	3.37%	2.43%	3.43%
United Kingdom	3.10%	1.71%	2.61%	2.39%	3.89%
United States	1.70%	1.73%	4.03%	3.47%	4.47%

Our government bond market valuation update 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)	Return Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
Australia	2.81%	2.96%	5.77%	5.67%	-0.10%	0.92%
Canada	2.00%	2.40%	4.40%	4.32%	-0.08%	0.80%
Eurozone	1.53%	2.37%	3.90%	3.62%	-0.28%	2.76%
Japan	0.37%	0.77%	1.14%	1.33%	0.19%	-1.83%

ISSN 1554-5067

	Current Real Rate	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
UK	1.71%	3.17%	4.88%	4.69%	-0.19%	1.82%
USA	1.73%	2.93%	4.66%	4.51%	-0.15%	1.48%

It is important to note that this analysis looks only at ten year 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 a government bond of comparable maturity) are above or below their historical averages (with below average credit spreads indicating potential overvaluation). Today, in many markets credit spreads are at the low end of their historical ranges.

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

Annual Exchange Rate Changes Implied by Bond Market Yields

	To A$	To C$	To EU	To YEN	To GBP	To US$
From						
A$	0.00%	-1.35%	-2.05%	-4.34%	-0.98%	-1.16%
C$	1.35%	0.00%	-0.70%	-2.99%	0.37%	0.19%
EU	2.05%	0.70%	0.00%	-2.29%	1.07%	0.89%
YEN	4.34%	2.99%	2.29%	0.00%	3.36%	3.18%
GBP	0.98%	-0.37%	-1.07%	-3.36%	0.00%	-0.18%
US$	1.16%	-0.19%	-0.89%	-3.18%	0.18%	0.00%

ISSN 1554-5067

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 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

ISSN 1554-5067

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) **-4.35%**	Value (IWW) **-0.40%**	Value (IWW) **-0.40%**	Growth (IWZ) **-4.35%**
Size Rotation	Small (IWM) **-5.25%**	Small (IWM) **-5.25%**	Large (IWB) **-1.55%**	Large (IWB) **-1.55%**
Style and Size Rotation	Small Growth (DSG) **-2.81%**	Small Value (DSV) **-5.21%**	Large Value (ELV) **-0.54%**	Large Growth (ELG) **-5.24%**
Sector Rotation	Cyclicals (IYC) **-3.58%** Technology (IYW) **-7.47%**	Basic Materials (IYM) **1.65%** Industrials (IYJ) **-2.26%**	Energy (IYE) **17.38%** Staples (IYK) **-1.27%**	Utilities (IDU) **4.54%** Financials (IYF) **-7.15%**
Bond Market Rotation	High Risk (VWEHX) **-1.70%**	Short Maturity (VBISX) **-0.70%**	Low Risk (VIPSX) **-0.30%**	Long Maturity (VBLTX) **0.10%**

Economic Update

Every six months (in March and September) we review the current outlook for the global economy, and its implications for asset class returns and asset allocation decisions. Our purpose is not to earn higher returns from market timing, but rather to avoid large losses by spotting substantial overvaluations while there is still time to reduce one's risk exposure. In

ISSN 1554-5067

this update, we will step back, and try to put the multiple uncertainties we confront today into a larger context.

Our basic frame of reference is complex adaptive systems theory, or CAS for short. A complex adaptive system is one in which a large number of variables are interrelated via multiple positive and negative feedback loops. A positive feedback loop accelerates a process (e.g., tendency of a fire to spread), while a negative loop slows it down (e.g., a fire dies down as the fuel in a given location is burned up). These interactions are even more complex in an adaptive system composed of human beings, who can vary their actions as they observe those taken by others (or reason about the actions others are likely to take).

Complex adaptive systems have a number of qualities that make their outcomes difficult to predict with any accuracy (particularly as the time horizon lengthens). First, cause and effect are often widely separated (e.g., by time, space, or network connections) in a CAS. Second, because of the complexity of these relationships, more often than not, CAS outcomes are non-linear (e.g., outputs are not proportional to inputs, as would be the case in a system of linear relationships). Third, complex adaptive systems typically have so-called "emergent" properties -- they give rise to intermediate and final outcomes that are hard to foresee on the basis of one's knowledge of the initial values of the systems' variables. Finally, the behavior of a CAS tends to shift from one state to another, based on the values of one or more critical input variables. For example, in a physical system, this critical variable might be the energy level; in a biological system, it might be the degree of selection pressure (i.e., the extent to which less fit organisms become lunch for the more fit ones). Researchers have defined three basic states in which complex adaptive systems operate. When the value of the critical variable or variables is low, the system is in a stable zone, in which it behaves in a reasonably predictable manner similar to a linear system. When the value of the critical variable(s) rises above a certain threshold, the system enters the "adaptive" zone, in which new properties emerge to manage the higher level of tension. Finally, if the value of the critical variable is pushed beyond an even higher threshold, the CAS enters the so-called "chaotic" zone. While system outcomes are not predictable or even adaptive in this region, neither are they completely random. Rather, they tend to fluctuate, at unpredictable intervals between a limited number of states, which are called "attractors."

ISSN 1554-5067

In our view, complex adaptive systems theory provides a very insightful framework for making sense of recent economic history, and to gain some sense of where we might be headed. Our overall thesis is that for the past 15 years or so, the global political economy has been operating above its first critical threshold, as a number of key domestic and international tensions (i.e., conflicts between competing goals) have intensified. This accounts for the large number of adaptive structures and behaviors that we have seen emerge, usually without explicit design by governments or market participants (we will give examples of these throughout this article). However, while adaptations have emerged, they have been insufficient to reverse the underlying intensification of the critical tensions. In light of this, we conclude that we are approaching (and indeed, in one case already entered for a while) a level of tension that causes the system to cross into the chaotic zone, in which it is simultaneously drawn to two attractors, which we label "equilibrium" (e.g., a state in which negative feedback loops predominate, and try to move the system back below the chaos threshold) and "conflict" (in which positive feedback loops accelerate the system's disintegration). A look at the key players in the system and the critical tensions within and between them will make this thesis more explicit.

We define the first critical player in our global political economic system to be the developed economies of Europe, North America, and Oceana. As Amity Shlaes from the *Financial Times* pithily described it, the key tension in these economies is the conflict between "tax eaters" and "tax payers" in countries whose populations are getting older and sicker, and with widening income and wealth gaps brought on by the shift to a global, knowledge based economy. "Tax eaters" comprise all those groups (and they are growing in number) who benefit from government transfer payments funded out of tax revenues. They include the poor and their advocates (including many non-governmental organizations), the health care industry, retirees, and public sector unions. Arguments in all of these countries over pension, health care, and welfare reform, along with taxes, are all parts of this phenomenon. In the United States (and to a lesser extent the U.K., Australia, and France), this conflict is made more acute by relatively high levels of defense spending (a situation that was foreseen years ago in a series of books by Mancur Olson, David Calleo and Paul Kennedy). In all of these countries, recent years have seen the emergence of adaptive structures to manage this tension, including attempts at pension and health care reform,

  ISSN 1554-5067

initiatives to improve the effectiveness and efficiency of government, modifications of the tax system (e.g., property tax revolts in the United States), the introduction of the Euro, and the recent weakening of the European Growth and Stability Pact. However, with the notable exception of Australia, none of these adaptive structures has managed to reduce the fundamental tension to a level that would return the system to a steady state. Indeed, in many western developed countries the tension still seems to be rising.

Japan faces a similar aging problem, but from a very different starting point. There the fundamental tension is between the need to raise productivity growth and the inability of the traditional government influenced, mercantilist economic system to deliver it. The Japanese political system is so dominated by groups that have benefited from the current system that change has been extremely difficult and painful, even in the face of over ten years of stagnant growth and deflation ("stag-deflation?"). To be sure, there have been some emergent adaptations, particularly with respect to Economy and Financial Services Minister Heizo Takenaka's herculean (and substantially successful) efforts to force Japan's banks to deal with their very large non-performing loan problems and to begin the painful process of corporate restructuring. However, other efforts, such as reform of the pensions system, and various privatization and structural reform efforts, have been blocked by the old guard of the ruling LDP party. Government debt relative to GDP is very high, and most recently, the economy appears to be weakening again.

In China, the fundamental tension between the need for economic growth and the desire of the Communist Party to retain control was reviewed at length in our September, 2004 Economic Update. There has been no shortage of emergent adaptive structures as this process has unfolded and intensified. These include not only China's accumulation of substantial dollar denominated foreign exchange reserves (as it financed the U.S. current account deficit, and its own exports to that country), but also the more recent recycling of these dollars in the form of foreign direct investment by Chinese companies. It is also looking increasingly likely that it may also soon include an appreciation of the renminbi verus the dollar. Other adaptations include Premier Wen Jiabao's anti-corruption policies, attempts to slow the growth of China's money supply and its state banks' non-performing loans, agricultural tax cuts, and attempts to reduce destabilizing regional income disparities through new education programs aimed at the country's agricultural population.

ISSN 1554-5067

However, as argued at length in an excellent new paper ("Will the Bretton Woods 2 Regime Unravel Soon? The Risk of a Hard Landing in 2005-2006" by Roubini and Setser), there is abundant evidence that these adaptive structures have not stopped critical tensions from increasing. They note how the Chinese government has not been able to "sterilize" the large inflows of dollars they are receiving, and that as a result the domestic money supply and credit creation have continue to grow at a torrid pace. This has fed not only price inflation (as less productive domestic companies have had to raise wages and prices to keep up with the productivity gains and wage increases of the more efficient export sector), but also a speculative domestic property boom. It has also led to very high rates of investment in other sectors of the economy; unfortunately, with the effective cost of capital so low, it is inevitable that a substantial percentage of these investments will not be profitable, and end up worsening Chinese state banks already extremely large problem with non-performing loans. When these growing bubbles eventually burst, a key uncertainty is where the inevitable losers will focus their anger -- will it be toward corrupt party officials, and the relatively small number of people who have grown very rich during the boom years, or will the government seek to deflect it by sharply escalating the conflict with Taiwan?

Another key player in the global system is the Arab world, which we define as the 22 members of the Arab League which between them have a population of 280 million. The fundamental tension they face is between their very young and rapidly growing populations and the weak performance of their economies (see, for example, the 2002 and 2003 "Arab Development Report" issued by the U.N. Development Programs for a fuller examination of these problems). Given their reluctance to make fundamental changes in their political and religious institutions, other adaptations have emerged, not all of which have been benign. Tightening oil supplies (via a slowdown in capacity growth), along with a strong world economy, have led to a sharp increase in oil prices and revenues for many of these countries. Current oil production capacity is estimated at 80 million barrels per day, and demand at 78 million barrels per day. However, many doubt that demand will remain at this level for long, as the sharp recent oil price increases triggers a slowdown (if not a contraction) in economic growth. Other adaptations have been less benign, and include not only the Arab countries' antagonism toward Israel, but also the emergence of radical groups who carried out (or attempted) asymmetric attacks on the United States, Spain, and other countries. These attacks

  ISSN 1554-5067

not only pushed the global system into the chaotic zone (where it continues to vacillate between conflict and equilibrium), but, more fundamentally, triggered responses (e.g., the invasion of Iraq, and elections in that country) that have only intensified the underlying tensions in the Arab world.

The asymmetric cross-border attacks by radical Arab groups is only one example of rising tensions that exist between, rather than within, regions. There are at least four others that have the potential to drive the system into chaos at some point. The first of these is the emergence of the United States as the world's sole superpower in the wake of the Soviet Union's collapse. It continues to trigger the emergence of adaptations. Two of these can be seen in the actions of those nations that have chosen to ally with the United States in an attempt to influence its behavior (e.g., Australia, the U.K., and to a lesser extent the other nations of the Anglosphere) and those nations that have attempted to form a loose alliance to confront it (e.g., France, Russia, China, and Iran).

This highlights the second source of international tension, which is the growth and expansion of China's power, in multiple spheres (e.g., economic and military) and multiple regions (e.g., Southeast Asia and South America). This too has triggered emergent adaptations, including the realignment of trade patterns (e.g., in Southeast Asia and Japan), the entry of China into the World Trade Organization, and the aforementioned system for recycling its growing foreign exchange reserves to finance the United States' current account deficit. Thus far, these adaptations have prevented the tensions caused by China's growing power from passing the second critical threshold. However, as previously noted, they may not prove effective if domestic tensions in China also "go critical."

The third tension in the world system is caused by the current imbalances between economic growth and savings across regions. As we have noted before, the global economy is over-reliant on two sources of domestic demand growth: the United States and China. Growth in the former is increasingly depends on foreign savings, to an unprecedented degree. The combined savings deficits (as a percent of GDP) of the United States' private (1.5%) and public (4.4%) sectors have never been as large a percentage of the United States' Gross Domestic Product, nor has their complement, the current account deficit (5.5%). Indeed, it is hard so see how this process can go on much longer, as U.S. consumers must be close to their borrowing limit, especially with the rise in house prices slowing down as interest rates begin

ISSN 1554-5067

to rise. We have also noted the fundamental instability inherent in China's high investment, mercantilist growth strategy. To this must be added the continuing heavy reliance on exports instead of domestic demand growth in Europe, Japan and the countries of Southeast Asia. In the first two cases, increased domestic demand requires domestic restructuring measures that seem politically impossible to achieve. In the case of Southeast Asia, high savings and low domestic demand reflect a number of factors, including weak public social security systems and the continuing pressure on profits still exerted by unprofitable investments made before the onset of these countries' balance of payments crises in the late 1990s. To be sure, adaptations have emerged to control the tensions caused by the imbalances in the world economy, first and foremost the previously mentioned foreign exchange recycling mechanisms. However, they have done nothing to resolve the underlying problems.

Moreover, other changes in an increasingly integrated world economy have made the resolution of its savings and growth tensions even harder to accomplish. Advances in technology (e.g., the internet) have made it possible for industry supply chains to stretch around the world, while increased competition and profit pressures have given companies the incentive to implement this strategy. This has made current account surpluses and deficits more resistant to changes in exchange rates, as manufacturing capacity has moved from the United States to Asian countries. In short, it isn't as easy to shift production from one country to another as it was in the old days. This means that either extremely large changes in exchange rates (the price mechanism) or substantial changes in demand (e.g., falls in the U.S. and increases in Europe, Japan, and developing Asia) will be needed to reduce savings and growth tensions in the world economy. As an important aside, we also note that technology has not only facilitated the flow of money, people, information, and goods around the world, but also microbes. This was vividly demonstrated when the SARS outbreak jumped from China to Hong Kong to Canada. While adaptations emerged to deal with this (e.g., improved monitoring by the WHO, and better cooperation between health authorities), the underlying threat remains a serious one (as evidenced by the growing concern over the potential for H5N1 "bird flu" to cause a global pandemic in humans).

The fourth tension in the world system is caused by the continuing effect of a classic supply-side shock: the development of the internet, and its associated technologies. The initial boom in technology stocks coincided with the sharp drop in private sector savings in

  ISSN 1554-5067

the United States. Why save out of income when your stock portfolio is appreciating in value every day (especially when that income was flat due to rising competition in a global economy)? This boom was accelerated by the decision of central bankers to sharply increase the money supply to avoid a global recession in the wake of two significant shocks -- the Asian currency crisis, and the Russian debt default and subsequent collapse of the Long Term Capital Management hedge fund. However, when the internet bubble finally burst, monetary authorities again added more liquidity to the system, while fiscal authorities cut taxes to keep the world from falling into a recession that, because of the build-up of debt levels, could easily have triggered a round of Japan-style deflation. The resulting fall in interest rates led to widespread appreciation in housing values, which in turn supported higher consumer borrowing and continued spending, particularly in the Anglosphere countries whose current account deficits powered the rest of the global economy. Unfortunately, this process is approaching the chaotic threshold, as U.S. interest rates rise in line with the dollar's fall. However, the gradual intensification of this tension also has produced a number of emergent adaptations, including the explosive growth of both derivative markets (to better diversify the growing risks in the world financial system) and hedge funds. As we have noted in the past (see our January, 2004 issue), we very strongly suspect that a great deal of the latter's reported returns have reflected their willingness to absorb risks that more prudent institutions did not want to hold. Unfortunately, we also suspect that hedge funds' willingness to take these risks is based on wrongheaded assumptions about the future availability of market liquidity if and when this tension passes its chaotic threshold. We believe that the consequences of this hidden systemic risk for many financial markets could be severe.

To summarize, our current thesis is that the global political economy -- the fundamental driver of asset class returns and risks -- is a complex adaptive system characterized by rising levels of tension within and between many of its key players. With the conspicuous and instructive example of the attacks by radical Islamic terrorists, up to now adaptations have emerged that have prevented these tensions from rising above the second critical threshold, and moving the system into the chaotic zone. However, in many cases they do not seem to have stopped or reversed the processes increasing these tensions; rather, they have simply helped the system to cope with them, and avoid crossing the chaotic threshold. We therefore have serious doubts about how much longer this will be the case.

ISSN 1554-5067

Obviously there are many possible scenarios that describe how the system could cross into the chaotic zone sometime in the next three years. We cannot exhaustively examine them all; rather, we will focus on only three: the most likely, the most dangerous (for investors) and a wild card scenario (for a longer review of these issues, see "Mapping the Global Future" by the National Intelligence Council, available at www.cia.gov/nic/NIC_home.html).

The most likely scenario continues to be that we will be able to muddle through for three more years. For example, Anatole Kaletsky, the respected financial writer for the *Times of London*, recently wrote about four groups of "zombie investors" whose insensitivity to bond yields make it hard to see how they would rise in the future, and thereby trigger sharp changes in our highly leveraged world economy and financial markets. The four zombies include (1) Asian central banks (who, as noted, buy U.S. dollar bonds regardless of their yield, in order to hold down their exchange rates and facilitate their nation's exports); (2) Western defined benefit pension funds (who, because of the rising age of their members, are trying to match their liabilities with investments in bonds); (3) Western life insurance companies (who, because they can no longer compete on the basis of superior investment returns, are increasingly focused on match funding their mortality liabilities with bonds); and (4) Japanese retail investors, for whom annuity products invested in U.S. bonds provide higher income than those based on yen Japanese bonds. Kaletsky concludes that "all global asset markets will remain severely distorted as long as the main suppliers of excess savings to the world economy -- Japanese private investors -- continue to live in a near zero rate environment. If the returns available [to them] domestically remain at or near zero, they will continue to invest in dollar and euro assets at what seem to be ridiculously low rates."

In the "muddle through for a while longer" scenario, commodities should continue to perform well. There may also be some upside left in equities, even in those markets that have not resolved their underlying tensions. The problem, of course, is accurately predicting when this game will end, or, to put it differently, being able to get out ahead of the crowd.

As we have written in the past, forecasting asset class returns requires one to make estimates not just about future changes in fundamental factors (e.g., interest rates and economic growth), but also about the future actions of other investors. As pointed out in the 1930s by John Maynard Keynes, this is ultimately a recursive game with no end -- I expect other investors to sell, but they will expect that I know that and so they might buy, in which

  ISSN 1554-5067

case I should sell, but they will also anticipate that, and so…You get the point. Moreover, forecasting other investors' behavior confronts an investor with two problems: first, there is a limit on the amount of cognitive processing power anyone has available to reason about this problem. Second, one has to take into account that some investors will not be acting rationally. Academic researchers have found that in this type of recursive reasoning game, a typical player usually thinks less than two steps ahead (e.g. see "A Cognitive Hierarchy Theory of One-Shot Games" by Camerer, Ho, and Chong). Recently, James Montier from Dresdner, Kleinwort, Wasserstein collected and compared a number of these academic studies, and published his findings in a research note (see "Who's a Pretty Boy Then? Or Beauty Contests, Rationality, and Greater Fools"). His premise is that many equity markets are experiencing "cynical bubbles" driven by portfolio managers' short-term time horizons (their performance is evaluated every year), and overconfidence about their ability to "beat the gun" and get out at or near the top. On the basis of the studies he reviews, Montier concludes that financial markets "seem to be characterized by investors using between one and two steps [of thinking ahead]. Hence, if you are to beat the exodus, you need to be thinking in terms of three steps [ahead], but no more." After sampling over 1,000 professional investors, he concludes that this type of thinking ability characterizes only 4% of them. He concludes, "this lends some support to our oft-voiced skepticism over the ability of the majority of investors to 'beat the gun.'" To this we would add that, in a complex adaptive system that is operating above its steady state threshold, it is very hard to make an accurate forecast, even if you are one of the few trying to think three steps ahead. And if the system is operating above its chaotic threshold, it is impossible, except by sheer luck.

Our most dangerous scenario is characterized by a sudden rush out of dollar investments, perhaps caused by foreign (and some domestic) investors' declining confidence in the ability of U.S. political leaders to resolve that country's fundamental internal tensions before they pass their chaotic threshold. This would not only cause a much sharper fall in the U.S. exchange rate than we have seen thus far, but also a sharper rise in nominal U.S. interest rates (as bonds are sold, their prices fall, which causes their yields to rise). Domestically, this could trigger a wave of bankruptcies by heavily leveraged consumers and a crash stop in their spending, which would plunge the U.S. into a deep, and quite possibly deflationary recession. Internationally, this would trigger a sharp drop in export demand in all those other regions

  ISSN 1554-5067

whose growth is heavily dependent on the United States. Most dangerously, this would include China, where the sharp slowdown in growth could easily trigger the bursting of domestic property bubbles and increased social unrest, with very unpredictable consequences. Finally, faced with a choice of inflating away the wealth of bondholders (and enriching holders of residential real estate with low fixed rate mortgages) or watching large numbers of voters losing their homes to bankruptcy, we believe it would not be long before American political leaders, possibly in cooperation with other nations, embarked upon a massive exercise in monetary expansion and reflation. Whether this would be sufficient to keep the world economy out of a prolonged Japan style stag-deflation remains to be seen. The good news, we suppose, is that judging from the many working papers they have recently published on this subject, the world's central bankers are devoting plenty of time to planning for this contingency.

Clearly, this scenario does not have good implications for returns on equities (with the possible exception of defensive sectors like consumer staples, utilities, and health care), or for commercial property (at least until inflation turns up). It might also be bad for some commodities, due to the sharp fall off in global demand. On the other hand, other commodities might perform quite well, such as physical gold and timber (e.g., Plum Creek Timber in the U.S., ticker PCL), both of which are good stores of value in inflationary times. In the initial deflationary period, high quality nominal bonds would do well, though they would suffer when inflation turned up. Those real return bonds that limit capital reduction under deflation (e.g., TIPS in the United States) would do well under both the deflationary and inflationary periods in this scenario. Otherwise, the challenge would be to accurately time one's switch out of nominal and into real return bonds when deflation gave way to inflation. For U.S. investors, foreign currency bonds would be attractive too; for non-dollar investors, they would not (i.e., with the dollar depreciating, you would not want to hold dollar denominated debt).

Our final scenario is a wild card -- a global flu pandemic caused by the mutation of H5N1 influenza into a form that is more communicable between humans. We include it because to a limited extent, it may be possible for well-informed investors to see it coming early enough to take appropriate action to protect their portfolios. Make no mistake -- this is a nasty little bug, scoring high in all the key viral events, including virulence (ability to spread

ISSN 1554-5067

quickly through a susceptible population), tropism (the number of different tissue types it attacks), and mortality (the number of infected cases it kills). For more on this, see www.recombinomics.com. Should our pandemic flu scenario occur, it is hard to see how we could avoid a dramatic slowdown in global demand and world trade. This would certainly be bad for equities, especially in those regions with poor health systems (e.g., emerging markets) where casualty rates could be very high. Global recession would also be bad for commodities, and commercial property. Moreover, if it became clear that large numbers of people were dying from H5N1 in developed markets, it could trigger a sharp deflation (because of oversupply of many goods and a credit collapse). Under these circumstances, nominal return government bonds and gold would probably perform best. We might also expect to see investment flowing into those countries deemed best able to recover after the pandemic had passed, either because they had been spared its worst ravages, or because their economies are particularly flexible. In the latter category, one would have to include the United States (or perhaps all the Anglosphere countries) as well as China (simply because its sheer size gives it a better ability to absorb a severe population shock).

As we noted before, in a complex adaptive system, it is basically impossible to accurately forecast future outcomes, particularly as the time horizon lengthens, and especially when the system is operating in either its adaptive or chaotic region. The best we can do is monitor various indicators that may give us advance warning of the direction in which the system is moving, and whether the probability of dangerous scenarios developing has increased. With that in mind, here is our updated list of key indicators and current conditions:

Indicator to Watch	**Dangerous Trend**	**Current Assessment**
Real Interest Rates	Falling trend	Falling
Oil Prices	Remain high and/or rise higher	Rising sharply
U.S. Ten Year Treasury Bond Nominal Yield	Rising trend	Rising
U.S. Dollar Exchange Rate	Falling trend (weakening dollar)	Falling

ISSN 1554-5067

Indicator to Watch	Dangerous Trend	Current Assessment
Inflation in China	Rising trend is a leading indicator of economic pressures; could lead to exchange rate appreciation and bubble collapse.	Rose for first two months of 2005.
Political Stability in China	Reports of growing political unrest	Growing reports of incidents involving disputes over property rights by people who feel cheated by corrupt officials. Premier has pledged tougher crackdown on corruption, and more aid to agricultural areas
Real Domestic Demand Growth in the Eurozone	Falling trend	Falling. Little progress toward structural reform.
Real Domestic Demand Growth in Japan	Falling trend	Recent growth has softened; deflation has reappeared.
Real Domestic Demand Growth in Southeast Asian Countries	Rising trend	Growth still strongly oriented toward exports
H5N1 Pandemic Influenza	Signs of increased communicability between humans, with no reduction in mortality rates	Some indications in Vietnam that communicability is improving.

In sum, since our last economic update, the probabilities have increased that our most dangerous scenario (or something similar to it) will occur. As noted in one of this month's letters to the editor, we are not ideologues on the subject of market timing. While we do not believe that it is possible for most mortals to consistently high risk adjusted returns by "timing the market", we also think that on some occasions, prudent risk management may require departures from one's long-term asset allocation policy. Our overall conclusion from this month's economic analysis is that we may be approaching this point. The problem, however, is that we're not sure whether this is more like March, 1998 (when a lot of people began to think that the U.S. equity market was significantly overvalued) or March 2000 (when a lot of

ISSN 1554-5067

those people, after wrongly betting against the market for too long, threw in the towel, just as their view was about to be proved right). Such is life in a complex adaptive system with rising tensions and investors who are cognitively limited, facing mixed incentives, and not always rational.

We continue to believe in the long-term advantages of a well-diversified index portfolio that can weather the storms of deflation and inflation, as well as sail at a good speed in normal times. That being said, a lot of asset classes, particularly equity, commercial property, and riskier debt, are looking quite overvalued today, which is not a good thing given what seems to lie ahead for the global economy. Moreover, if one looks at this month's Global Asset Class Returns matrix, it is clear that many asset classes have begun to experience negative year-to-date returns. It therefore seems clear that this is an appropriate time to rebalance one's portfolio, and to reset the weights of equity asset classes at a level five to ten percent below their long-term target. The best choice for the resulting overweights would seem to be real return bonds, foreign currency bonds (if you are a U.S. dollar based investor), shorter term government bonds, or perhaps to implement a tilt toward gold or timber in commodities. In addition, if one's domestic bond allocation is tilted to longer maturities or high risk issues, now would be an excellent time to consider a move to a shorter maturity, lower risk tilt.

Commodity Index Returns: A Deeper Look

Historically, commodities have delivered real returns roughly equal those on domestic equity. While their volatility has typically been higher, their correlation with most other asset classes has been very low (with the exception of real return bonds). As a result, including commodities has historically provided substantial diversification benefits (see, for example, "Strategic and Tactical Allocation to Commodities for Retirement Savings Schemes" by Nijman and Swinkels).

With the benefits of commodities as an asset class being recognized by more investors, they are also receiving increasing attention from academic researchers. A number of interesting papers have recently been published, which we will review in this note. To

ISSN 1554-5067

understand the arguments, made in them, we need to review some rather arcane technical aspects of commodity futures pricing. Please bear with us!

A futures contract is a promise entered into with a commodities exchange (e.g., the New York Mercantile Exchange) to deliver (when you sell a futures contract) or receive (when you buy a futures contract) a specified quantity of a specified commodity at a specified date in the future -- for example, 1,000 barrels of oil, at a price of $40 per barrel, 12 months from today. However, rather than delivering or receiving the actual physical commodity, most sellers and buyers of futures contracts buy or sell an offsetting contract at the specified maturity date.

Commodity indexes, such as the Goldman Sachs Commodities Index, or the Dow Jones-AIG Commodities Index, are weighted baskets of different commodity futures. Funds that track these indexes (e.g., the Oppenheimer Real Assets Fund -- QRAAX or the PIMCO Commodities Real Real Return Fund -- PCRDX) are net buyers of commodities futures contracts (this is also known as being "long futures").

The return generating process within a commodity index fund is complex, and has three parts. The first is the return they earn on their excess cash. A futures contracts is purchased on margin, which means that you pay less than 100 percent of its face value when you initially buy it. As long as this futures contract's price is lower than the spot price, the margin requirement is usually quite small (if the spot price drops below the futures contract's price, the commodities exchange may demand more cash -- a so-called "margin call" -- to limit its credit risk exposure). For example, let's say an investor buys a share of a commodity index fund for $100. Let's further assume that the fund manager has to spend only $10 to purchase $100 of futures contracts on the commodities that make up the index being tracked. That leaves $90 in excess cash that can be invested to earn a return that is unrelated to the earnings on the futures contracts. Theoretically, there is no constraint on where that $90 might be invested. It could, for example, be invested in emerging market equity shares. However, this might create marketing problems for the commodity index fund, since its returns would therefore be a mix of two volatile asset classes – commodities and emerging markets equities. To avoid this problem, commodity index funds typically invest their excess cash in low volatility asset classes, such as nominal or real return government bonds.

ISSN 1554-5067

The second source of the return on a commodity index fund is the diversification benefit that results from investing in a mix of different commodities whose returns have very low correlations with each other. The third source of return for a commodities index fund is the insurance premium it earns from being a buyer of commodity futures contracts. Let's look more closely at the theoretical source of this return.

The classical argument for the use of futures contracts starts with a commodity producer, who faces relatively high fixed costs (e.g., as would be the case for a farmer, mine owner, or oil production company). This producer is assumed to sell the commodity to an intermediate customer who faces relatively variable demand from final customers for his goods. In addition, the intermediate customer is assumed to have lower fixed costs than the commodity producer. Swings in demand by final customers cause the intermediate customer to cut back his purchases from the commodity producer. Given that the producer's production is relatively fixed, this causes big swings in prices for the commodity. Unfortunately, because the commodity producer has high fixed costs, these price swings can force it into bankruptcy. Commodity producers therefore have a strong interest in hedging the risk they face from price swings.

Obviously, one way to limit these swings would be to insert a storage operator into this simple system, who buys from the producer when demand falls, and sells this accumulated inventory to the intermediate customer when demand rises. The operations of this storage provider balance swings in demand, and in so doing, keep the price for the commodity relatively stable. However, two obstacles may prevent a storage operator from entering the system. First, it may be technically impossible (or very expensive) to store the commodity in question for anything other than a short period. For example, this is the case with oil. While it is feasible to build tank farms to maintain small oil inventories, the amount of tanks that would be necessary for large inventories is prohibitively expensive. This means that most of the physical response to swings in oil demand comes not from inventory in tanks, but from changes in the amount of oil that is pumped from the ground. Apart from physical storage challenges, there may also be financial ones. If the price swings over time in a given commodity are large, so too must be the amount of equity in a storage operator's capital structure. If the capital costs of building the storage facility are large, this can create financial barriers to entering the storage business.

ISSN 1554-5067

The financial futures markets provide an efficient alternative to physical storage as a means of managing the price risk facing commodity producers. When futures markets exist, producers can sell their production forward (i.e., sell a futures contract) to lock-in a price (and hopefully a profit) for their company. When the futures contract matures, the producer simply buys an offsetting contract, and delivers the physical commodity to a physical buyer. Theoretically, any loss or gain on the physical commodity should be almost completely offset by the loss or gain on the futures contract. Why almost? Because the buyer of the futures contract is, in effect, providing price insurance to the commodity producer, and needs to be compensated for taking this risk. However, futures contracts do not include an explicit risk premium; instead, this is created by having the futures contract trade at a lower price than the "spot price" (i.e., the price at which the physical commodity can be purchased for immediate delivery). In the arcane language of the commodities markets, the fact that futures contracts trade at lower price than the spot price is known as "normal backwardation", or simply "backwardation." The buyer of the futures contract therefore earns her risk premium in the form of the difference between the lower price at which she buys it, and the higher price at which she sells it (which assumes that, as the futures contract nears maturity, its value rises to match the level of the spot market price).

Simple enough, right? However, as is true in most areas of life, sometimes that futures markets don't behave according to this theory. Specifically, there are times when the spot price is actually lower than the futures price. In the language of commodities, this is known as "contango", which has nothing to do with a dance from Argentina.

Why might a commodity be in contango? First, a market may experience an unexpected increase in supply (e.g., think of oil producing nations breaking their OPEC production quotas), or an unexpected fall in demand (e.g., the impact of the discovery of mad cow disease in Canadian beef). In this case, one would expect adjustments in supply and demand that returned the market to a state of "normal backwardation." An alternative theory has also been advanced that proposes the existence of more consistently "contangoed" markets. For example, consider a breakfast cereal producer that, through effective marketing, has created a steady demand for its products. One of its most important input costs is grains -- e.g., wheat and corn. To limit variation in its reported profits, it may purchase futures contracts to lock in its grain costs. Assuming there are also financial investors bidding for a

  ISSN 1554-5067

finite supply of futures contracts being sold by farmers, the price of the futures contract may rise above the spot price for the grains. In this situation, the net provider of price insurance would not be the party buying the futures contracts, but rather the party selling them, since at maturity (when the futures price moves to the level of the spot price) the seller will be able to purchase an offsetting futures contract at a lower price than he received for the one he originally sold.

Careful readers will, like us, probably be shaking their heads at this argument. Why? Because it presumes that, having just received a negative risk premium on the futures contracts they bought, the financial investors would repeat their mistake. We think this is unlikely to happen, as such investors would, over time, abandon a market with such unattractive structural features.

One of the most interesting of the recent papers on commodity investing is “"The Tactical and Strategic Value of Commodity Futures" by Erb and Harvey. In their paper, the authors analyze the returns earned on long positions in different commodity futures between December, 1982 and May, 2004. They assume that the presence of positive average returns implies a market that was, on average, backwardated, while negative average returns would imply a market that was, on average, contangoed. Specifically, Erb and Harvey measure the "excess return" on the commodity futures above the return on three month treasury bills. Assuming the latter is approximately equivalent to inflation, Erb and Harvey's measure of "excess returns" is roughly equal to real returns. The following table summarizes their findings:

Commodity	**Average Annual Excess Return over 3 mos. T-Bill**	**Standard Deviation of Excess Returns**
Heating Oil	10.51%	32.55%
Live Cattle	5.94%	13.98%
Live Hogs	0.17%	24.21%
Wheat	-3.32%	21.05%
Corn	-3.32%	22.65%
Soybeans	1.92%	21.49%
Sugar	3.69%	38.65%
Coffee	0.85%	39.69%

ISSN 1554-5067

Commodity	Average Annual Excess Return over 3 mos. T-Bill	Standard Deviation of Excess Returns
Cotton	2.60%	22.64%
Gold	-4.81%	14.36%
Silver	-5.30%	25.03%
Copper	9.15%	25.69%
GSCI Index	5.81%	16.97%

This table makes a number of interesting points. Erb and Harvey point to the much lower standard deviation of returns on the GSCI compared to those on the twelve individual commodities as evidence of the substantial diversification return provided by the index.

They also note that support for "normal backwardation" (which would be indicated by a positive average excess return) appears to be uneven, with some commodities apparently more often in contango. This leads them to conclude that "long-only" commodities futures indexes like the Goldman Sachs Commodities Index or the Dow Jones AIG Commodities Index are inefficient ways to invest in commodities futures. This leads them to two proposals. The first is for a "long/short" commodity fund that would permanently have long positions in commodities that, historically, have on average been backwardated, and short positions in those commodities that have, on average, been contangoed. In both cases, the commodity fund would be earning a premium for providing price insurance.

The table also shows how an active approach could be implemented at the index level, using GSCI futures. They note that "since the inception of GSCI futures trading in 1982, the GSCI has been backwardated as often as it has been in contango. The annualized payoff from buying the GSCI when the term structure is backwardated is 11.2%. However, when the term structure is contangoed, the annualized excess return is negative (5.0%)." This leads them to propose an active management strategy that buys GSCI futures when the index is backwardated (as evidenced by a positive return over the previous year), and sells them when it is contangoed (as evidenced by a negative lagged return). On a backtested basis, they find that this strategy would have generated an excess return of 8.2% per annum over the period they studied.

ISSN 1554-5067

Besides Erb and Harvey, other researchers have also identified commodities active management strategies that would have delivered higher returns than the index had they been used in the past. For example, in "Dynamic Commodity Timing Strategies" by Vrugt, Bauer, Molenaar, and Steenkamp the authors investigate various timing strategies, models and indicators that could be used in an active management strategy. They conclude that "variation in commodity future returns is sufficiently predictable to be exploited by a realistic timing strategy." Similar papers include "An Anatomy of Futures Returns: Risk Premiums and Trading Strategies" by de Roon, van den Goorbergh, and Nijman and "Conditional Means, Volatilities, and Correlations in Commodity Futures Markets" by Chong and Miffre (which also finds that long-only commodities strategies provide excellent diversification benefits during recessions).

However, another paper provides an important cautionary tale about the dangers of depending too heavily on the accuracy of a relatively short period of backtested results as a guide to a commodities active management strategy. In "Backwardation in Energy Futures Markets: Metallgesellschaft Revisited" Carupat and Deaves describe how, in early 1990s, MG lost an enormous amount of money using futures to hedge its long term gasoline and heating oil physical delivery contracts (the actual loss was caused by the company selling at a loss futures contracts on which it had had to post rapidly increasing amounts of cash collateral). MG's strategy was premised on the continuation of backwardation in crude oil futures markets. The authors find that, using data available to MG (1984 to 1992), risk of contango appeared acceptable to MG at the time the strategy was undertaken -- the probability of negative returns at least as large as the ones MG actually experienced was "only" 3.77%, based on backtesting the available data. However, when the authors backtested a longer data set that extended to 2000, they found that the estimated probability of a disaster scenario rose to 7.32%.

So where does this leave us? As we have repeatedly noted, the underlying process that generates asset class returns is very complex, and broadly composed of two subparts: a fundamental process (e.g., that generates company investments, cash flows, and reported earnings) and a behavioral process (e.g., the reaction of investors to changes in the fundamentals, plus their anticipation of how other investors will react). Moreover, the way this process operates changes over time (i.e., one or both sub-parts is "non-stationary"). It is

  ISSN 1554-5067

therefore non-linear, and extremely difficult to forecast accurately for any length of time. This is no less true of commodities than it is of any other asset class. We are therefore suspicious of all claims that make the potential gains from active management in commodities seem too easy. After all, if academics have discovered them, why wouldn't hedge funds use them and arbitrage away their expected excess returns?

However, this still leaves the question of whether the GSCI or DJAIG are appropriately designed indexes for a core investment in commodity futures. We believe they are, for two reasons. First, as Erb and Harvey note, both are heavily weighted towards commodities that, in the past, have typically been backwardated.

Second, think about the implications for commodity markets of the changes now underway in the world economy. The most important of these has been the rapid growth in demand for commodities by fast growing developing countries, and especially China. While this demand growth has driven up the price of many commodities, it has also caused an expansion of supply. This means that if you own a commodity producing company today, you are looking at a world with higher supply, in which the marginal demand is provided by developing countries whose economic growth rates (and hence commodity demand) are significantly more volatile than those of developed countries. While some developed country commodity markets may still have demand that is relatively more stable than supply (as in our cereal producer example), this is much less likely than before to be the case for the global market as a whole for that commodity. In sum, our view of the global economy leads us to conclude that backwardation in commodity markets -- and hence, positive insurance premiums for long-only commodity index funds -- should be more common than in the past. For both of the reasons we have cited, we continue to believe that diversified commodity index funds are an efficient and prudent way for most investors to gain exposure to the commodities asset class.

The Equally Weighted Portfolio: Pros and Cons

This year, we have introduced a new benchmark for the performance of our model portfolios: an equally weighted mix of eight broadly defined asset classes, including real return bonds, domestic investment grade bonds, foreign currency bonds, commercial property,

ISSN 1554-5067

commodities, domestic equity, foreign developed markets equity, and emerging markets equity. This is our version of the so-called "couch potato portfolio." This note will review the theoretical justification for the use of this benchmark, as well as how it has performed in comparison with our model portfolios over the past sixteen years.

As we have frequently noted in our writing, the future risks and returns of different asset classes are inherently uncertain. In making assumptions about what they will be, investors typically use some combination of two approaches.

The first approach uses historical results to make assumptions about the future. These will be accurate only if two additional assumptions are true. First, the returns generating process must be constant over time (technically, it must be "stationary"). Second, the true parameters of this process (e.g., its expected return and standard deviation) must be accurately described by the historical data sample being used to estimate them. If either or both of these assumptions is not true, assumptions about the future derived from historical data will contain so-called "estimation errors", and lead to sub-optimal asset allocations (which will only be clear with hindsight).

The second approach uses a model to estimate future risk and return assumptions for an asset class. For example, future equity returns might be estimated using the current dividend yield plus an estimate of future dividend growth, while future equity volatility might be estimated using a model that switches between periods (or "regimes") of high and low volatility. In this case, the problem is that there are multiple models that can be used to describe a returns generating or volatility process, with no way of knowing how accurate they will be in the future. To the extent that a model is inaccurate, assumptions about the future derived using it will contain so-called "model errors", and lead to sub-optimal asset allocations (which again will only be clear with hindsight).

In our last asset allocation review (conducted in 2003), we concluded that both historical data (a backward looking approach) and modeling (a forward looking approach) provided unique and valuable insights about future asset class risks and returns. Hence, our asset allocation models use a weighted mix of inputs from both sources. However, we also recognize that there are other ways to account for estimation and model errors.

For example, one alternative approach starts with the observation that the relative riskiness of different asset classes is more stable over time than their relative returns. It

  ISSN 1554-5067

therefore assumes that the returns on all asset classes are equal, and uses only differences in risk to make asset allocation decisions. One example of this is the "Minimum Variance Portfolio" which makes allocations to different asset classes to minimize expected portfolio standard deviation (volatility).

Another alternative approach makes the more radical assumption that all attempts to forecast future asset class risks and returns will be overwhelmed by estimation and model errors. Hence, the best approach is to identify different sources of returns, and equally divide one's portfolio between them. While we don't agree with this approach, we think it makes for an intellectually rigorous benchmark for our model portfolios.

Equally weighted portfolios have also begun to be studied by more and more academic researchers. One of the earliest papers on this subject was "Naïve Diversification Strategies in Defined Contribution Savings Plans" by Benartzi and Thaler. They analyzed aggregate allocations to different funds offered within 401(k) plans in the United States, and concluded that they seemed to indicate that participants employed equally weighted (or so-called "1/N heuristic" or rule of thumb) asset allocation strategies. They also inferred that this was fundamentally irrational, since the resulting asset allocations appeared to be driven by the mix of funds offererred by the plan, rather than an individual investor's future goals and risk tolerance.

In a subsequent paper, "The 1/N Heuristic in 401 (k) Plans" by Huberman and Jiang, the authors looked at actual investments by over 500,000 actual individuals in their 401(k) plans. In contrast to Benartzi and Thaler's inference, they found that plan participants typically invested in a small number of funds (regardless of the number offered by the plan), but used the 1/N heuristic to allocate funds between the funds they used. Huberman and Jiang conclude that this behavior was not inconsistent with a belief that plan participants were acting in a rational manner, assuming they realized the benefits of diversification but believed they had no ability to forecast future asset class risks and returns.

In a recently published paper, "Irrational Diversification", Post and Baltussen found (using an experimental analysis) that people applied the 1/N heuristic after first excluding investments that had poor risk/return characteristics if held in isolation, regardless of their potential diversification benefits (e.g., commodities or perhaps foreign currency bonds might be good examples of such investments). However, the authors also found that this behavior

ISSN 1554-5067

was sharply reduced when the participants received information about diversification benefits before making their asset class allocations (which was a great relief to us, as it is the underlying principle upon which our business is based!).

Finally, in "How Inefficient are Simple Asset Allocation Strategies", DeMiguel, Garlappi, and Uppal compare the performance of an equally allocated portfolio with the performance of portfolios produced by many other commonly used asset allocation models. They find that the equally weighted approach is "not very inefficient" and "performs quite well out of sample" As we will now demonstrate, the findings from our backtesting analysis are consistent with this paper's conclusions.

The following table present sixteen years of backtested real returns for our model portfolios, covering the 1989 to 2004 period. These returns are based on the returns of underlying asset class indexes, and do not include the expense charges on the specific mutual funds or exchange traded funds that an investor may use within each asset class. In addition, because every investor's tax situation is different, the returns we show are all pre-tax.

While the 1989 to 2004 period is the longest one for which reasonably good returns data is available for all our asset classes, they are still not perfect. For example, the sector coverage of the property index returns series varies widely. The data series for real return bonds also present a challenge, since this asset class was not available in some currency regions over the full 1989 to 2004 period. In these cases, we have extended our real return bonds data series by using the return on nominal return bonds, less 75 basis points (0.75%), which is our estimate of the return premium for unexpected inflation risk required by investors in nominal return bonds. Finally, as we noted in our December 2004 review of "Investing in Debt Markets", there are also issues regarding how accurately market capitalization weighted bond indexes capture the risks and returns of investing in these asset classes. For all these reasons, the real returns we show in the following tables are imperfect estimates of how our asset allocations would have performed in an actual investor's portfolio.

At the bottom of the table, we provide three summary measures. "Geometric Average" is the compound annual return over the full 16 year holding period. "Annual Average" is the arithmetic (simple) average annual return over the same period, and "Standard Deviation" (also known as "volatility") is a measure of the dispersion of annual returns around their average, which is one measure of risk.

ISSN 1554-5067

Year	7% Real	6% Real	5% Real	4% Real	3% Real	2% Real	Equally Wtd.
1989	19.6%	18.7%	16.0%	9.9%	3.4%	1.9%	15.9%
1990	-5.5%	-6.3%	-8.7%	-0.9%	2.3%	2.5%	-4.8%
1991	25.4%	24.4%	21.2%	14.2%	6.1%	5.3%	18.1%
1992	5.4%	4.4%	1.4%	2.5%	3.9%	3.6%	2.7%
1993	13.8%	14.8%	18.0%	11.4%	4.3%	4.5%	16.2%
1994	-1.4%	-1.0%	0.2%	-0.5%	2.8%	2.9%	-0.3%
1995	22.1%	20.9%	17.2%	13.1%	6.2%	5.0%	12.1%
1996	15.1%	14.4%	12.2%	8.0%	6.7%	3.9%	11.0%
1997	12.3%	10.9%	6.6%	2.3%	1.5%	1.5%	2.7%
1998	5.7%	5.6%	5.1%	1.5%	-0.4%	2.6%	-2.2%
1999	17.9%	18.1%	18.6%	7.4%	0.2%	-1.3%	15.9%
2000	-4.8%	-5.0%	-5.4%	4.3%	10.9%	8.6%	1.6%
2001	-9.9%	-10.5%	-12.4%	-4.3%	-3.2%	-2.4%	-8.2%
2002	-5.6%	-5.4%	-4.9%	6.0%	13.9%	13.8%	2.1%
2003	26.5%	27.0%	28.6%	16.8%	9.9%	7.9%	23.8%
2004	12.5%	12.9%	14.1%	9.6%	7.9%	6.3%	13.0%
Geom. Avg.	8.7%	8.4%	7.4%	6.2%	4.7%	4.1%	7.1%
Annual Avg.	9.3%	9.0%	8.0%	6.3%	4.8%	4.2%	7.5%
Std. Dev.	11.9%	11.9%	12.0%	6.0%	4.5%	3.9%	9.4%

ISSN 1554-5067

It is also very interesting to compare the performance of our equally weighted portfolios in their respective currencies:

Equally Weighted Portfolios
1989-2004 Performance

Currency	**A$**	**C$**	**Euro**	**Yen**	**GBP**	**US$**	**Avg.**
Geometric Average Return	8.2%	7.2%	6.5%	5.2%	6.6%	7.1%	6.8%
Average Annual Return	8.7%	7.4%	7.2%	5.8%	7.3%	7.5%	7.3%
Standard Deviation	10.2%	7.1%	12.2%	12.0%	12.2%	9.4%	10.5%
Return/SD	0.85	1.03	0.59	0.48	0.60	0.80	0.69

As you can see, the consistency in their performance, particularly with respect to their returns, is quite striking. So too is their performance relative to asset allocations with different target returns. In five of the six regions, the performance of the equally weighted portfolio fell somewhere between the 4% and 5% target return portfolio; in the case of the Euro, it was between the 5% and 6% target return portfolio.

Clearly, the past may not be a valid guide to the future. However, to the extent that it is, it would appear that an equal allocation to broadly defined asset classes is not a bad approach to take if you haven't the time to think things through more carefully. That being said, history also shows that it is possible to achieve better performance than that delivered by the equally weighted portfolio -- either to earn more return by taking on more risk than the equally weighted portfolio, or to earn lower returns with much less risk. As always, the critical issue is the compound rate of return needed to fully achieve an investor's long-term goals. Depending on what that is, an equally weighted portfolio may be too risky, not risky enough, or just right for the task.

ISSN 1554-5067

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

  ISSN 1554-5067

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 31Mar05	**Weight**	**Weighted Return**
	In US$		In US$
7% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	-0.3%	0%	**0.0%**
U.S. Bonds	-0.5%	0%	**0.0%**
Non-U.S. Bonds	-3.3%	20%	**-0.7%**
Commercial Property	-7.3%	10%	**-0.7%**
Commodities	11.2%	10%	**1.1%**
U.S. Equity	-2.4%	50%	**-1.2%**
Foreign Equity (EAFE)	-0.2%	0%	**0.0%**
Emerging Mkt. Equity	1.4%	10%	**0.1%**
		100%	**-1.3%**

.

	YTD 31Mar05	**Weight**	**Weighted Return**
	In US$		In US$
6% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	-0.3%	0%	**0.0%**
U.S. Bonds	-0.5%	0%	**0.0%**
Non-U.S. Bonds	-3.3%	20%	**-0.7%**
Commercial Property	-7.3%	10%	**-0.7%**
Commodities	11.2%	10%	**1.1%**
U.S. Equity	-2.4%	45%	**-1.1%**
Foreign Equity (EAFE)	-0.2%	5%	**0.0%**
Emerging Mkt. Equity	1.4%	10%	**0.1%**
		100%	**-1.2%**

.

ISSN 1554-5067

	YTD 31Mar05	Weight	Weighted Return
	In US$		In US$
5% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	-0.3%	0%	**0.0%**
U.S. Bonds	-0.5%	0%	**0.0%**
Non-U.S. Bonds	-3.3%	20%	**-0.7%**
Commercial Property	-7.3%	10%	**-0.7%**
Commodities	11.2%	10%	**1.1%**
U.S. Equity	-2.4%	30%	**-0.7%**
Foreign Equity (EAFE)	-0.2%	20%	**0.0%**
Emerging Mkt. Equity	1.4%	10%	**0.1%**
		100%	**-0.9%**

.

	YTD 31Mar05	Weight	Weighted Return
	In US$		In US$
4% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	-0.3%	5%	**0.0%**
U.S. Bonds	-0.5%	35%	**-0.2%**
Non-U.S. Bonds	-3.3%	20%	**-0.7%**
Commercial Property	-7.3%	10%	**-0.7%**
Commodities	11.2%	10%	**1.1%**
U.S. Equity	-2.4%	5%	**-0.1%**
Foreign Equity (EAFE)	-0.2%	10%	**0.0%**
Emerging Mkt. Equity	1.4%	5%	**0.1%**
		100%	**-0.5%**

.

ISSN 1554-5067

	YTD 31Mar05	Weight	Weighted Return
	In US$		In US$
3% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	-0.3%	75%	**-0.2%**
U.S. Bonds	-0.5%	0%	**0.0%**
Non-U.S. Bonds	-3.3%	10%	**-0.3%**
Commercial Property	-7.3%	10%	**-0.7%**
Commodities	11.2%	5%	**0.6%**
U.S. Equity	-2.4%	0%	**0.0%**
Foreign Equity (EAFE)	-0.2%	0%	**0.0%**
Emerging Mkt. Equity	1.4%	0%	**0.0%**
		100%	**-0.7%**

.

	YTD 31Mar05	Weight	Weighted Return
	In US$		In US$
2% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	-0.3%	85%	**-0.3%**
U.S. Bonds	-0.5%	0%	**0.0%**
Non-U.S. Bonds	-3.3%	10%	**-0.3%**
Commercial Property	-7.3%	5%	**-0.4%**
Commodities	11.2%	0%	**0.0%**
U.S. Equity	-2.4%	0%	**0.0%**
Foreign Equity (EAFE)	-0.2%	0%	**0.0%**
Emerging Mkt. Equity	1.4%	0%	**0.0%**
		100%	**-1.0%**

ISSN 1554-5067

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 31Mar05	**Weight**	**Weighted Return**
	In US$		In US$
Equally Weighted	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	-0.3%	12.5%	**0.0%**
U.S. Bonds	-0.5%	12.5%	**-0.1%**
Non-U.S. Bonds	-3.3%	12.5%	**-0.4%**
Commercial Property	-7.3%	12.5%	**-0.9%**
Commodities	11.2%	12.5%	**1.4%**
U.S. Equity	-2.4%	12.5%	**-0.3%**
Foreign Equity (EAFE)	-0.2%	12.5%	**0.0%**
Emerging Mkt. Equity	1.4%	12.5%	**0.2%**
		100%	**-0.2%**

ISSN 1554-5067