The Index Investor

Why Pay More for Less?

Global Asset Class Returns

Year to Date	In USD	In AUD	In CAD	In EURO	In JPY	In GBP
US Equity	10.60%	(5.83%)	(4.29%)	(1.50%)	11.09%	8.98%
US Bonds	4.00%	(12.43%)	(10.89%)	(8.10%)	4.49%	2.38%
AUS Equity	19.30%	2.87%	4.41%	7.20%	19.79%	17.68%
AUS Bonds	19.04%	2.61%	4.15%	6.94%	19.53%	17.42%
CAN Equity	21.80%	5.37%	6.91%	9.70%	22.29%	20.18%
CAN Bonds	19.77%	3.34%	4.88%	7.67%	20.26%	18.15%
Euroland Equity	12.30%	(4.13%)	(2.59%)	0.20%	12.79%	10.68%
Euroland Bonds	16.54%	0.11%	1.65%	4.44%	17.03%	14.92%
Japan Equity	(2.30%)	(18.73%)	(17.19%)	(14.40%)	(1.81%)	(3.92%)
Japan Bonds	1.16%	(15.27%)	(13.73%)	(10.94%)	1.65%	(0.46%)
UK Equity	7.60%	(8.83%)	(7.29%)	(4.50%)	8.09%	5.98%
UK Bonds	5.47%	(10.96%)	(9.42%)	(6.63%)	5.96%	3.85%
World Equity	8.95%	(7.48%)	(5.94%)	(3.15%)	9.44%	7.33%
World Bonds	7.25%	(9.18%)	(7.64%)	(4.85%)	7.74%	5.63%
Commodities	8.90%	(7.53%)	(5.99%)	(3.20%)	9.39%	7.28%

Model Portfolio Update

The objective of our first set of model portfolios is to deliver higher returns than their respective benchmarks, while taking on no more risk. The benchmark for the first portfolio in this group is an aggressive mix of 80% domestic equities, and 20% domestic bonds. Through the end of May, this benchmark had returned 9.3%, while our model portfolio had returned 10.2%. We have also compared our model portfolios to a set of global benchmarks. In this

case, the global benchmark is a mix of 80% global equities, and 20% global bonds. Through the end of last month, it had returned 8.6%.

The benchmark for the second portfolio in this group is a mix of 60% domestic equities and 40% domestic bonds. Through the end of last month, it had returned 8.0%, while our model portfolio had returned 9.4%, and the global benchmark had returned 8.3%.

The benchmark for the third portfolio in this group is a conservative mix of 20% domestic equities and 80% domestic bonds. Through the end of last month, it had returned 5.3%, while our model portfolio had returned 6.4% and the global benchmark 7.6%.

The objective of our second set of model portfolios is to deliver less risk than their respective benchmarks, while delivering at least as much return. The benchmark for the first portfolio in this group is an aggressive mix of 80% domestic equities, and 20% domestic bonds. Through the end of last month, this benchmark had returned 9.3%, while our model portfolio had returned 10.0%. We have also compared our model portfolios to a set of global benchmarks. In this case, the global benchmark is a mix of 80% global equities, and 20% global bonds. Through the end of last month, it had returned 8.6%.

The benchmark for the second portfolio in this group is a mix of 60% domestic equities and 40% domestic bonds. Through the end of last month, it had returned 8.0%, while our model portfolio had returned 8.4%, and the global benchmark had returned 8.3%.

The benchmark for the third portfolio in this group is a conservative mix of 20% domestic equities and 80% domestic bonds. Through the end of last month, it had returned 5.3%, while our model portfolio had returned 6.8% and the global benchmark 7.6%.

The objective of our third set of model portfolios is not to outperform a benchmark index, but rather to deliver a minimum level of compound annual nominal return over a ten-year period. Through last month, our 12% target return portfolio has returned 10.2% year-to-date, our 10%

target return portfolio has returned 9.3% our 8% target return portfolio has returned 8.8%, and our 6% target return portfolio has returned 6.5%.

Last month, the active portfolio was allocated as follows: 60% to the Vanguard Inflation Protected Securities Fund, 15% each to the Oppenheimer Real Assets Fund and the T. Rowe Price International Bond Fund, and 10% to the U.K. Equity Market iShare. These will not change next month. Year-to-date, our actively managed portfolio has returned 14.1%.

Equity Market Valuation Update

As we have previously noted, our valuation analysis rests on two fundamental assumptions: that over the long term, labor productivity growth in our six major regions will converge to between 2.5% and 3.5% per year, and that the long term real equity risk premium is 4.0% per year. Given those assumptions, here is our updated market valuation analysis at 30 May, 2003:

Country	Real Risk Free Rate	Equity Risk Premium	Required Real Return on Equities	Expected Real Growth Rate*	Div Yield	Expected Real Equity Return
Australia	2.67%	4.0%	6.67%	4.3%	3.90%	8.20%
Canada	2.92%	4.0%	6.92%	4.1%	2.00%	6.10%
Eurozone	1.79%	4.0%	5.79%	3.5%	3.10%	6.60%
Japan	1.50%	4.0%	5.50%	3.2%	1.10%	4.30%
U.K.	1.95%	4.0%	5.95%	3.5%	3.60%	7.10%
U.S.A.	2.30%	4.0%	6.30%	4.4%	1.70%	6.10%

**This reflects not only 3.5% productivity growth, but also expected labor force growth.*

Country	Implied Index Value*	Current Index Value	Current/Implied (productivity growth @3.5%	Current/Implied (productivity growth at 2.5%)
Australia	388.63	236.17	61%	86%
Canada	172.77	243.60	141%	191%
Eurozone	171.00	126.32	74%	106%
Japan	34.93	73.04	209%	300%
U.K.	371.26	252.66	68%	96%
U.S.A.	352.34	393.79	112%	171%

* *Assuming 3.5% future productivity growth*

Economic Outlook

This article updates our previous economic outlooks, which we published in May, 2001, December, 2001, June, 2002, and November, 2002. As we have in the past, we will present what we see as the most likely and the most dangerous scenarios for the months ahead.

Let's start with some key figures, that will help put the current situation in perspective. The table below shows the percentage of global output (Gross Domestic Product) that different countries and regions produced in 2002. These amounts are valued using two different approaches. The first is the market exchange rates that prevailed in 2002. The second, called purchasing power parity (PPP), is an estimate of what output shares would have been had exchange rates been set at a level that would have equalized their purchasing power across countries (e.g., so that the price of a McDonald's Big Mac would be the same in every country). The third column shows how fast real GDP is expected to grow this year in each area.

Percent of Global Output in 2002

	At Market Exchange Rate	At PPP Exchange Rate	Forecast GDP Growth 2003
Australia	1.2%	1.2%	3.0%
Canada	2.3%	2.0%	2.8%
Mexico	2.0%	1.9%	2.3%
Eurozone	20.8%	15.7%	1.1%
Japan	12.5%	7.1%	0.8%
U.K.	4.9%	3.1%	2.0%
U.S.A.	32.6%	21.1%	2.2%
China	4.4%	12.7%	8.0%
Other Asian Countries*	4.1%	6.7%	4.1%

*Indonesia, S. Korea, Malaysia, Philippines, Singapore, Thailand, Taiwan
Sources: IMF, OECD, Asian Development Bank

This table makes quite clear one of the key issues facing the global economy today: the rapid emergence of the People's Republic of China as a major economic power. The underlying forces driving this growth are clear: reduced barriers to international trade and an improved regulatory climate have supported substantial capital inflows, which have enabled a large, educated and very cheap (by world standards) workforce to generate phenomenal rates of productivity improvement (e.g., ABN AMRO bank has estimated that labor productivity may be growing by as much as 14.7% per year). However, as output has grown more rapidly than domestic consumption demand, this has led to dramatic increases in Chinese exports. In many industries around the world, this sharp increase in supply has created substantial downward pressure on prices.

Normally, the resulting Chinese balance of payments (current account) surplus would lead to upward pressure on China's exchange rate, which would slow export growth (when you sell more goods and services to foreigners than you buy from them, the amount of your currency they have to buy is greater than the amount you need to sell, leading to upward pressure on your exchange rate). However, in the absence of fast domestic demand growth, this would

also lead to a slowdown in overall economic growth, which could easily lead to increased social and political instability (remember that most revolutions happen not when times are bad, but when they are improving, but reality falls short of expectations). Hence, the goal of China's leaders has been to preserve fast growth at all costs. To do this, they have offset the upward pressure on their exchange rate caused by their current account surplus by printing new money. What is much less clear is what will happen next in China. However, before discussing these possible outcomes, we also have to look at the other major issue facing the world economy: the overall weakness of global demand.

The following table highlights the sources and consequences of the problem. It is based on what is known as the "economic balance equation", which is an easy, yet powerful technique for summarizing what is happening in an economy. The basic logic is that the difference between domestic savings and domestic investment must be balanced by inflows or outflows to other countries. If domestic savings exceeds domestic investment needs, the country will run a balance of payments surplus; if domestic savings are less than investment, the country will run a balance of payments deficit.

The domestic economy can be further sub-divided into the private and the public sectors. In the private sector, saving equals the difference between after tax income and personal consumption expenditures, while investment includes business inventory, equipment and structures as well as residential construction. All else being equal, there are only two ways to boost private sector savings: either reduce private consumption, or increase output per unit of input (productivity) without increasing consumption. In the government (public) sector, net saving is equivalent to a fiscal budget surplus, while net investment is equal to a fiscal deficit.

The economic balance equation can help to clarify the policy options open to countries facing different circumstances. For example, consider a country that needs to reduce its balance of payments deficit. This can only be accomplished through improvements in the private sector balance and/or the public sector balance. The former requires reductions in either consumption and/or investments, or that these be held constant in the face of productivity

driven increases in real output. Alternatively, improving the public sector balance requires either higher taxes or less government spending.

In the table, all balances are expressed as a percentage of domestic and world GDP, to make them comparable across countries. Let's look at Australia as an example. The private sector balance in Australia this year is estimated to be negative, and equal to (4.9%) of GDP. In other words, investment spending by the private sector in Australia is expected to exceed private sector savings (output less consumption) by an amount equal to (4.9%) of GDP. On the other hand, the Australian government sector is forecast to run a surplus (or a net savings position) equal to .2% of GDP. Combining these two amounts shows that overall, Australian investment is forecast to exceed domestic savings by an amount equal to (4.7%) of GDP, which is also the forecast current account deficit (or, to think of it another way, the amount of savings from the rest of the world Australia will need to import to finance its consumption and investment spending). To get a better understanding of the relative magnitude of the financial flows this creates, the final column in the table expresses the forecast current account deficit not as a percentage of Australia's GDP, but of World GDP from 2002. As you can see, this year Australia will need to obtain cash inflows from foreigners equal to .06% of World GDP (by issuing bonds, shares, bank deposits or other financial liabilities to them).

	GDP Growth Rate, 2003	**Private Sector Balance as % of GDP**	**Gov't Sector Balance as % of GDP**	**Current Account Balance as % of GDP**	**Current Account Balance as % of World GDP***
Australia	3.0%	(4.9%)	0.2%	(4.7%)	(.06%)
Canada	2.8%	0.2%	1.4%	1.6%	.03%
Mexico	2.3%	(1.4%)	(1.3%)	(2.7%)	(.05%)
Eurozone	1.1%	3.5%	(2.4%)	1.1%	.23%
Japan	0.8%	10.1%	(7.4%)	2.7%	.34%
U.K.	2.0%	0.6%	(2.6%)	(2.0%)	(.10%)
U.S.A.	2.2%	(0.7%)	(4.6%)	(5.3%)	(1.73%)

	GDP Growth Rate, 2003	Private Sector Balance as % of GDP	Gov't Sector Balance as % of GDP	Current Account Balance as % of GDP	Current Account Balance as % of World GDP*
China	8.0%	4.5%	(3.0%)	1.5%	.07%
Other Asian Countries*	4.1%	5.4%	(2.1%)	3.3%	.13%

*Using GDP based on market exchange rates
Sources: IMF, OECD, Asian Development Bank

As you can see from the table (especially the last column), the fundamental demand problem facing the world economy today is an unsustainable reliance on the United States as the main source of economic growth. The Eurozone, Japan, China, and the Developing Asian countries have all generated current account surpluses because they have relied on exports to keep their economies growing in the face of weak private consumption and investment demand. In contrast, in Australia, the U.K., and the United States domestic demand (consumption and investment spending) has grown faster than the overall economy, and they have sucked in imports from the rest of the world. For example, between 1995 and 2004, the IMF estimates that real personal consumption will have grown by about 3.5% annually in Australia, the U.K., and the U.S., but by only 2.5% in the Eurozone and 1.0% in Japan. And the differences in investment spending is even bigger.

Unfortunately, this game can't go on much longer, because there is a limit to the amount of debt the U.S. private sector can take on to finance consumption and investment spending that is faster than national income growth (the same is true in Australia and the U.K., but the magnitude of their impact on world demand is smaller). Consider the following: between 1999 and 2002, consumer credit (e.g., credit card debt) owed by U.S. households rose from 2.9% to 3.7% of their total assets. During the same period, mortgage debt rose from 9.2% to 12.5% of total household sector assets, while the business sector's aggregate debt to market value of equity ratio rose from 27.6% to 66.7%.

As we have written before, we are coming to the end of the line for a period which saw rising financial asset values support increased borrowing and spending, then a crash in financial asset values, followed by a sharp fall in interest rates that boosted home values and led to a wave of mortgage refinancings (many of which generated cash savings which were spent on more consumption). However, with mortgage interest rates at 45 year lows, this process is sharply slowing down, and we are now in the end game of the "U.S. demand problem." U.S. businesses are moving to shore up their balance sheets (and move the private sector balance toward positive territory), and have sharply cut back investment spending. With short term interest rates approaching zero, prices flat or falling in many industries, wage increases non-existent, and employment uncertainties growing, and credit quality problems on the rise (e.g., bank non-performing/total loans have risen from 1.0% in 1999 to 1.5% in 2002, while charge-offs have risen from .6% to 1.1% of total loans), we may already be in the early stages of a deflation in the United States.

In fact, had it not been for a sharp rise in the public sector balance over the past year (i.e., an increase in the public sector deficit), a fall in U.S. demand already would have occurred. However, there are limits on the extent to which the U.S. public sector deficit can be expanded to maintain U.S. GDP growth (and the growth of those countries whose economies heavily depend, directly or indirectly, on exports to the U.S.). First, there is the distinct possibility that, faced with weak balance sheets, the household sector will save rather than spend any tax cuts they receive, particularly if those tax cuts (as now seems to be the case) are targeted at people with relatively high incomes (many of whom also have large debts). This would force the current Republican Congress and President to consider the ideologically unpleasant notions of either tax cuts for the less well-off, or direct government spending.

But even if this were to happen, there is no guarantee that the rest of the world would be willing, at current prices, to continue to finance the U.S. current account deficit. The U.S. equity market is still relatively richly priced (in terms of historical valuation measures), while bond yields are at the lowest levels seen in almost fifty years. In response, some will argue that foreign private sector investors will keep buying U.S. assets because they are the "least unattractive" of those available in the world today. Our response is that the recent data seem

to indicate that this isn't happening, and that it is foreign central banks (particularly in those Asian countries running large current account surpluses) that have recently become the biggest buyers of U.S. assets.

So what happens next? And what could it mean for returns on different asset classes?

The obvious solution to the demand side of the problem would be for the Eurozone and Japan to increase domestic demand growth in their economies. In Europe, three obstacles stand in the way of this happening. First, faster private sector growth is inhibited by excessive regulations and other "structural rigidities" in the labor and product markets that make it difficult to hire and fire workers, start new firms and close failing ones. Were these removed, the IMF (in its April, 2003 World Economic Outlook) estimates that GDP could be boosted by ten percent over the medium term. While some steps have recently been taken that may lead to reforms in these areas (e.g., proposed pension reforms in Germany and France), it remains to be seen whether the political will exists to actually implement them. Second, expansion of the government balance (i.e., more deficit spending) is inhibited by the Growth and Stability Pact that was put in place at the time the new Euro currency was launched. While arguments have been made that current circumstances justify breaching the limits set by the Pact, no agreement on this matter has been reached. Finally, further interest rate cuts by the European Central Bank are inhibited not only by the widely varying rates of inflation within the Eurozone, but also by the fear that, absent removal of the structural rigidities which block the expansion of output, rate cuts would only result in higher inflation.

In Japan, with the government balance already at (7.4%) of GDP, and the government debt/GDP ratios at an all-time high, demand stimulation via government deficits is probably at its limit. However, the country faces substantial obstacles to faster private sector demand growth. First, Japan today has technically insolvent banks funding equally insolvent companies in order to provide jobs for workers who do nothing. The country has put in place the institutional structures to resolve this problem (The Resolution and Collection Corporation for restructuring the banks' bad loans, and the Industrial Revitalization Corporation for

restructuring insolvent companies). Unfortunately, even after ten years of suffering, it still appears to lack the political will to make use of them, for fear of the rise in official unemployment that would result. Second, goods and services prices in Japan have now fallen for four straight years, and deflationary expectations are becoming entrenched. This not only further inhibits any growth in private consumption spending (why buy anything today if its price will fall tomorrow?), but also limits investment spending by businesses (due to the rising real value of the debts they owe). Finally, there is a third structural obstacle to further domestic demand growth that may be the most difficult of all to overcome: Japan's fast aging population and weak social security system encourages people to save rather than spend, and in so doing forces the economy to depend on exports for growth.

While a shift in global demand growth to the Eurozone and Japan would allow a domestic demand reduction and balance sheet strengthening to occur in the United States, it still would not reduce the deflationary pressures facing many industries. For that, a reduction in global supply is needed. One way to accomplish this would be to close down relatively high cost excess capacity that currently exists in many industries. This, is sure to trigger two objections. First, some of this capacity may well become economic again assuming a pickup in global demand. Second, and more important (in political terms), much of this relatively high cost capacity is located in developed countries, while much of the low cost capacity (which is currently enjoying higher utilization rates) is located in the developing countries, and especially in China (where newly built capacity has dramatically changed the cost economics in many industries). Hence it seems inevitable that China will come under increased pressure to raise its exchange rate, which would simultaneously reduce the competitiveness of its exports and provide more purchasing power to domestic consumers, and thus another source of domestic demand growth for the world economy. The obstacle that must be overcome, however, is the concern on the part of China's leaders that the pickup in domestic demand growth may lag the fall-off in exports, causing overall economic growth to slow and social and political unrest to increase.

Broadly speaking, our most likely and most dangerous scenarios for the global economy are driven by the way these critical demand and supply issues play out in the months ahead.

In the **most likely scenario**, the current situation initially continues to develop along the lines we have seen over the past two months. The U.S. dollar continues its decline against the Euro, while the Japanese and Asian countries initially intervene in the foreign exchange markets to prevent the appreciation of their currencies versus the dollar. To put this in perspective, from its low point (on a trade weighted basis) in April, 1995, the U.S. dollar rose 51% to its high in February, 2002. Since then, it has fallen by only 17%. This results in a fall in Eurozone exports, and leads to some progress in terms of regulatory reform, which, along with an agreement to breech the Stabilization Pact and further rate cuts by the European Central Bank leads to an increase in domestic demand growth. In terms of the economic balance equation, the government balance becomes more negative, the private sector balance shrinks, and the current account surplus is reduced.

In the United States, a slowdown in personal consumption spending (and rebuilding of household balance sheets) causes the private sector balance to turn positive. The overall negative impact on the country's growth is moderated by a further expansion in the public sector deficit. The current account shrinks, though by less than the positive change in the private sector balance. In the face of a declining dollar exchange rate, the potential increase on the real returns required by foreigners to hold U.S. dollar assets is moderated by the continued willingness of Asian Central Banks to keep accumulating dollar denominated assets at current or slightly higher rates of return. The quid pro quo for this is reduced U.S. pressure for sharp exchange rate increases by these countries versus the dollar.

In Japan, the pace of progress toward restructuring failed banks and companies picks up speed, helped by an upward revaluation of the Chinese renminbi which enables a shift of Japanese exports from the U.S. to the Chinese market, where domestic demand is growing. Given the large amount of liquidity they have created through their efforts to hold down the renminbi/dollar exchange rage, the Chinese wisely decided that it is better to revalue and stimulate import growth than to face the prospect of either consumer price inflation or a Japan like stock and/or real estate bubble. Progress in Japan is further helped by a clear commitment by the Bank of Japan to a long term inflation target, which breaks the cycle of

deflationary expectations and leads to a further increase in domestic demand growth. In short, we muddle through, with slower, but better distributed global demand growth and a reduction in the supply pressures from China.

In the **most dangerous scenario**, demand growth falls off more sharply than expected in the United States. This could be due to any of the following: a further sharp fall in the equity market; a sharp rise in natural gas prices (caused by the growing imbalance between domestic demand and potential North American supply); a failure of government deficits to produce the expected levels of domestic demand (e.g., due to tax cuts being saved rather than spent); a fall in housing values; or a sharp fall in the dollar exchange rate (and resulting sharp rises in the price of many imports). At the same time, the Eurozone fails to muster the political will to pass structural reform measures, or to breech the deficit limits set by the Growth and Stability Pact. Growth stagnates there too, and is accompanied by calls for increased trade protection against imported products. In Asia, Japan fails to make progress on the restructuring front, and deflation picks up speed. China refuses to revalue the renminbi, and maintains its focus on strong export growth, which gains further stimulus from the fall in the dollar's exchange rate versus the Euro. In terms of the economic balance equation, in the Eurozone and Asia, the current account balance shrinks (due to falling exports), as does the private sector balance (due to falling consumption and investment). In the United States, the current account deficit shrinks, as the private sector surplus grows (as consumption and investment fall). In short, a world in global recession comes face to face with a sharp increase in deflationary pressure, due to both falling demand and continued low cost supply from China. If we reach this point, things will, as they say, begin to get "really interesting."

The best outcome would be a coordinated policy of reflation by the Central Banks in the world's major regions, coupled with aggressive structural reforms to spur domestic demand growth. However, this strikes us as unlikely to occur, due to the conflicting interests of those regions which are net creditors (who would be hurt by inflation) and those which are net debtors. (Not to mention the differing political interests of the leaders of these areas, and their respective views about the relative attractiveness of a unipolar versus multipolar world). Broadly speaking, the creditors include the Eurozone and Asia, while the debtors comprise

the Anglo Saxon countries. Assuming that this conflict of financial interests blocks a coordinated attempt at reflation, the more likely outcome is the imposition of trading controls (to manage the current account), and subsequent attempts at economic recovery within each of the resulting blocs. A fascinating question to ponder is the shape these blocs might take. Based on geography and interests, one could easily imagine three taking shape. One in Asia, centered on China and Japan, with the former the growth driver; another centered on the Eurozone, and a third centered on NAFTA. Where the UK and Australia would end up in this mix is a very interesting question to ponder. If you assume that the most aggressive attempts at reflation would take place in the NAFTA bloc, then this would certainly be an incentive for these two Anglo Saxon countries to abandon their natural geographic partners, who seem less likely to pursue an aggressively inflationary course. An equally interesting question is what the implications of this scenario would be for cross border investment holdings. It seems quite likely that if trade was disrupted, the same would be true of international financial flows.

Finally, some of you reading this will immediately dismiss this "most dangerous" scenario as unlikely to happen. We hope you're right. However, we'd like to leave you with one last cautionary thought on this subject, from the August 20, 1992 New York Times:

"The Japanese Government has spent most of the last two years denying that the economy could be harmed by tumbling stock and land prices. Tuesday's announcement … of a package of emergency financial measures to stabilize the markets, shore up Japanese banks and calm the worries of investors was an important shift in policy at a time when most economists agree the economy is in a recession…The announcement showed that despite the Government's continuing show of bravado, it feared that plunging stock prices and a mounting burden of bad loans at banks had reached a point where a panic might break out among anxious investors. Perhaps more important, the announcement signaled the Government's abandonment of the long-held position that the plummeting prices of shares and real estate could not weaken the country's industrial base -- what officials call the 'real economy'…The finance minister seemed to acknowledge for the first time Tuesday that what is really at stake now is the health of the economy, not just the well-being of

speculators…Indeed, the evidence has been mounting…Economic growth has slowed to a rate of less than two percent, from 4.5 percent last year.

The problems, known here as the deflation of the 'bubble economy' began with a series of Government policies during the 1980s. The bursting of the bubble was not an accident, but the product of deliberate government actions. In 1985, Japan agreed -- under pressure from the United States -- to lower the value of the dollar against the yen to try to curb Japan's growing trade surplus. While Japan was eager to relieve the American political pressures, it was also fearful that a sudden decline in exports would push the economy into a recession. The Government responded by cutting interest rates to historically low levels and pumping cash into the financial system. Stock and land prices soared. The rising asset prices set of a chain reaction…In mid-1989, the central bank changed course. Sensing that the boom had gotten out of hand, the Bank of Japan began to raise interest rates. By mid-1990 the stock and property markets were in turmoil. Still, Government officials insisted the decline in asset prices was under control…Now that has changed…Still, many experts remain skeptical of the Government's new plan."

Asset Allocation Update: Part 1

Over the next two months, we will present a review of asset allocation issues. A common mistake we have seen others make is to focus too much attention too early in the process on different optimization techniques and the model portfolios they produce. To avoid that, we will defer our discussion of these subjects to next month, and instead start with some equally important issues that often don't get the attention they deserve.

What Drives Portfolio Returns?

Let's start with a list of the factors that determine the return you earn on your investment portfolio. They include the following:

- The asset classes in which you will consider investing your money, and the way your define them.

- The percentage of your total portfolio that you invest in these asset classes.

- The extent to which, and the circumstances that will trigger departures from these basic weights.

- Whether you will implement this strategy using active investment managers or index funds.

- The specific funds you will use to implement your strategy (e.g., based on their costs and tax effectiveness, and, if actively managed, your perception of the manager's relative skill).

- How often you will rebalance your portfolio to its target asset class weights. Along with your answers to questions 1, 2, and 3, your answer to this question is critical to your ability to control the riskiness of your portfolio (because less frequent rebalancing runs the risk of being more exposed to adverse events than you planned when you established your basic allocation strategy).

While all of these questions are critical, this review will only focus on the first two questions, which together constitute the basic "asset allocation" challenge.

Asked to define the meaning of "asset allocation", most people would give answer similar to question two, and say that it has something to do with the way you divide your investments between different groups of similar assets. Unfortunately, this overlooks question one, which is arguably far more important in terms of its impact on the returns you earn and the risks you take. Here's an example of what we mean: Ask five of your friends to identify the different asset classes in which they've considered investing. You are almost certain to hear answers

that include "growth stocks", "value stocks", "bonds", "small caps", "international stocks" and occasionally "real estate." As we have written many times, the problem with these answers is that they are either too narrow or too broad. Given that the reason you diversify your investments across different asset classes is to minimize the riskiness of your portfolio, you want to avoid investments whose returns tend to move too closely with the other investments in your portfolio (statistically, you want to invest in asset classes whose returns have a low correlation with the returns on other asset classes in the portfolio). Given this, the problem we have when someone says "growth stocks", "value stocks", and "small caps" is that from our perspective their returns are all have relatively high correlations with each other, which makes them all members of the same asset class: domestic equities. In other words, the answer above contains not six, but rather at least four different asset classes: domestic equities, international equities, bonds and real estate.

The second issue that is raised by this answer is that, unlike the three flavors of domestic equities, some of the other asset class definitions are too broad rather than too narrow. For example, assuming "bonds" means "domestic bonds", we see not one, but at least three different asset classes: real return bonds (that protect you against inflation); investment grade bonds (that protect you against deflation); and high yield (also known as "junk") bonds that are more problematical (more on that later). By now you've got the point (actually, you probably got it a while back, but have been bearing with us because you're polite): While the actual allocation of your portfolio to different asset classes is important, the definition of the asset classes you will even consider is critical.

How Important is Asset Allocation?

But let's put that behind us, and move on to the next logical question. Just how important is the allocation of your assets between different asset classes? This is one of our favorite questions, because it is so frequently answered incorrectly. Unfortunately, there is no simple answer. Consider two investors, who (to simplify matters), have to answer two questions: how to allocate their assets between three asset classes, and whether to implement this strategy using index funds or actively managed funds. How important is asset allocation (as

opposed to manager or security selection) to the returns they achieve? There are four ways to answer this question, and they are all correct.

If the two investors choose different asset allocations, but both implement their strategies using the same index funds, then asset allocation accounts for 100% of the difference in the returns they achieve after ten years. Similarly, if they have the same asset allocations and implement them through the same index funds, asset allocation again accounts for 100% of the returns they achieve.

On the other hand, suppose they both have the same asset allocations, but choose different actively managed funds to implement their common strategy. In this case, asset allocation would account for zero percent of the difference in the returns their portfolios achieve after ten years. All of the difference would be due to some combination of manager selection (by our two investors), stock picking skill (by the managers of the funds each one invests in), and the costs and taxes incurred by the respective funds.

So far, each of these answers has been pretty straightforward. The far more difficult situation is the fourth one, in which our two investors have different asset allocation strategies and choose different actively managed funds to implement them. In this case, the answer has been the source of quite a bit of controversy and disagreement between academics and industry players. The key disagreement is over the right measure you should use to answer the question. Two key studies on this issue have been conducted. The first is titled "Does Asset Allocation Policy Explain 40%, 90%, or 100% of Performance?", by Roger Ibbotson and Paul Kaplan. The second is "The Contribution of Asset Allocation to Portfolio Performance", by Wolfgang Drobetz and Friederike Kohler. The first study used ten years of data from the United States on the performance of balanced mutual funds (that invested in different combinations of bonds and stock), while the second used seven years of data on balanced mutual fund performance from Germany and Switzerland. Fortunately, both of these studies reached similar conclusions.

One way to measure the impact of asset allocation is to see how well a fund's basic asset allocation strategy explained the returns it earned from year to year. To do this, each study performed a regression analysis, in which the independent variable was the weighted performance of the basic asset allocation (e.g., if stock was 60% of the fund, and earned 10%, while bonds were 40%, and earned 5%, the asset allocation measure for the year would be 8%), and the dependent variable was the actual performance of the fund. As you might guess, the range of answers was wide. The 90% confidence range for one study was 47% to 94%, while for the other it was 58% to 96%. But what does this really tell us? In actual fact, it doesn't tell us much at all. Some funds apparently stuck quite closely to their basic asset allocation policy, while others did not. What this measure doesn't tell us is whether these active management departures from funds' basic asset allocations ended up benefiting or hurting investors.

To answer that question, you need to use a different approach, and both studies did so. For each fund they compared the compound annual return earned over the study period by the base case asset allocation to the compound annual return actually earned by the fund (both before costs and taxes). If ratio between the two returns was less than 100%, active management had added value; if it was greater than 100%, active management had destroyed value. The results of this analysis were not pretty (if you are an active manager). In the first study, the 90% confidence range was from 86% to 113%, and in the second it was from 101% to 180%. In other words, most funds studied (especially those in Germany and Switzerland) were destroying value through active management. Therefore, by this measure, asset allocation policy was responsible for almost all the returns earned by investors.

Should we also conclude from these two studies that the American mutual fund managers were better than their German and Swiss counterparts? We don't think so. A key difference between the two studies was the number of asset classes between which the mutual funds studied divided their assets. In the American case, there were only three; domestic bonds, domestic equities, and cash. In the German/Swiss case, more asset classes were used, including foreign stocks and bonds. In general, the correlations of returns within an asset class are likely to be higher than the correlations of returns between asset classes. Therefore, as the

number of asset classes in which you invest increases, the importance (to your returns) of asset allocation relative to security selection is likely to rise. In our eyes, this goes a long way toward explaining the relative underperformance of the German/Swiss fund managers relative to their American counterparts. Another way of looking at this same question is to compare the average performance of top quartile and bottom quartile active managers in different asset classes. Where the difference between the two is relatively small (e.g., in domestic bonds and public equities), asset allocation choices should have a much bigger impact on realized returns than manager (i.e., stock selection) choices. Conversely, the relative importance of asset allocation should be lower when substantial investments are made in asset classes where the performance gap between top and bottom quartile managers is large (e.g., hedge funds or private equity funds).

So, in answer to our original question, “how important is asset allocation?” our conclusion is that in most cases it is likely to be the key determinant of the long-term returns you will realize on your investments.

Intuitively, How Do You Do It?

Okay. Now that we've defined it and shown why it is important, let's move on to how you should go about dividing your assets between different asset classes. Before we introduce any numbers, let's start with some basic principles. First, every investor faces the challenge of balancing downside protection (against capital loss) with upside potential (for high returns). Second, research has shown that in general, people are more sensitive to losses than they are to gains of the same magnitude. Third, your need for downside protection is also a function of the length of your investment horizon (how long before you'll need the money) and whether or not you are making regular withdrawls from your savings (as would be the case, for example, if you were gradually drawing down your savings to pay your bills during retirement). The shorter the time before you need the money, and the more you're planning on taking out along the way, the more downside protection you need. Fourth, the degree of mismatch between your current and expected savings and your financial goals can (absent a change elsewhere) tends in practice to create situations where the amount of downside

protection you want is less than the amount you can afford (in terms of foregone returns on higher risk assets). In other words, there is usually a tradeoff between your lifestyle, your financial goals, and your asset allocation. As with so many other things in life, there is no free lunch here either!

Finally, different asset classes provide different degrees of downside protection and upside potential. Broadly speaking, our "home market" (we think of this as the market in which returns are denominated in the same currency as our liabilities) can be in one of three states: normal, high inflation, or deflation. In the normal state, we don't need as much downside protection as we do in the other states, and look to equity type investments to generate high returns for us. In the inflationary state, we look to asset classes like real return bonds and commodities (and possibly foreign bonds and real estate, but more on that later) to protect the purchasing power of our capital. Finally, in the deflationary state, we look to investment grade bonds to preserve our capital while maximizing our real returns.

Hopefully, by now we've accomplished our two main goals in writing this article: we've confirmed the importance of asset allocation, and given you a better intuitive understanding of how to do it well. So at this point you might want to go and get a cup of tea (or whatever) before we move on to our next section, in which we'll begin to look at different asset classes in more depth, and using more numbers.

A Closer Look At Different Asset Classes

We are now about to embark on a short tour of the different asset classes in which you may invest. Before leaving, however, we'd like to say a few words about some of the statistical animals we'll encounter in the coming paragraphs. First, all of the data you'll be seeing will be real (yes, quite…), rather than nominal. By that we mean, all of the numbers will be net of inflation. We do this because one goal of investing is to preserve, and ideally increase your purchasing power over time. Given this, the fact that an asset class earned 12% in nominal terms is meaningless unless you know what inflation was over the same period. If it was 5%, you earned a 7% real return. If it was 14%, you earned a real return of negative (2%).

Second, we will express returns two ways. Arithmetic returns are the simple average of a series of returns earned over a given time period. Geometric returns are the compound annual return earned over the same period. If the same return is earned each year, then the arithmetic and geometric means are the same. However, if different returns are earned in each period, then the two average returns will be different. For example, an investment that returns 15%, (10%), and 10% over three years has an arithmetic average return of 5% per year, but a geometric, or compound average annual return of about 4.42% per year. This example also illustrates a larger point: the greater the volatility of annual returns, the more the geometric average return will tend to be below the arithmetic average return. So why do we use both of these terms? In any given year, the arithmetic return is the best measure of the return you are likely to earn. This is therefore the return that we use in our optimization models, which we'll discuss next month. It is also the return we'll use when we develop estimates of how the returns different asset classes may earn in the future. However, over a longer holding period (which is a more accurate description of the situation faced by most investors), geometric returns better describe the returns that were actually realized in the past. So we'll use them too to provide perspective.

Finally, as we have discussed in the past, no single statistic gives a good picture of the riskiness of a given asset class. So we'll use four of them. We can hear the groans now! Let me explain. A lot of entry level finance textbooks define risk as the extent to which returns over a given period of time are distributed around the arithmetic average return for the period. In stats-speak, this is known as the variance or the standard deviation of returns (the latter is the square root of the former, but we won't belabor the point…). The problem is, when asked to define financial risk, most people don't talk about the standard deviation of returns. Typically, they'll say something like "risk is the chance I'll lose my money", or "risk is the probability I'll fall short of achieving my goals." In other words, in most people's minds, risk is not the symmetrical concept that textbooks assume it is when they equate it with the standard deviation of returns. So we need to take some other factors into consideration when we talk about the riskiness of an asset class.

The first we've already mentioned. It is the extent to which the returns on a given asset class vary with those on other asset classes. In stats-speak, this is called the covariance, or correlation of returns. If the latter is equal (at one extreme) to 1.0, they two series move in tandem in the same direction (not good for your portfolio). If (at the other extreme), the correlation of returns between two asset classes equals (1.0), they also move in tandem, but in opposite directions (surprisingly, not as good for a portfolio as you might think). And if their correlation equals zero, their returns are completely unrelated. Intuitively, to minimize the downside risk in a portfolio, you'd like to have some asset classes that have low positive or negative correlations with one another.

There is, however, an important catch. When we say that a correlation of zero means that the returns on two asset classes are completely unrelated, we're assuming that both return series are "normal" distributions. These are the familiar bell curve found in every introductory statistics textbook that has ever been written. In fact, once you assume that any set of data is normally distributed, a whole world of different statistical tests opens up to you. For example, you can say with confidence that about 68% of the time, the return on a normally distributed asset will fall within the range defined by the arithmetic average, plus or minus one standard deviation, and about 95% of the time, it will fall between the mean plus or minus two standard deviations. Unfortunately, not many financial assets have returns that are normally distributed. It is for that reason that we have to drag two other statistical terms into our conversation.

The first is called "skewness", and it measures the extent to which a given distribution of returns is "off center" or "tilted" compared to a normal distribution. Specifically, a normal distribution has a skewness of zero. A skewness less than zero indicates that more returns fall below the arithmetic average than above it, while a positive skewness indicates just the opposite. The returns on many asset classes (but not all of them) are negatively skewed. Generally speaking, we don't like negative skewness (actually, to be technically correct, what we really don’t like is coskweness, but we’re not going to go there in this article!), although we accept the fact that sometimes we have to accept it as one of the prices of earning higher returns.

The second statistical measure we need to use to assess asset class risk is called "kurtosis". This measures the extent to which a given distribution of returns is taller or shorter than the normal distribution. If it is taller, it is said to have "excess kurtosis". Practically, this means that because relatively more returns are clustered closer to the average return than would be the case if the distribution was normal, it must also be the case that relatively more returns also lie in the tails (that is, the extreme ends) of the distribution (that is, in order for the two distributions to have the save average return). In contrast, distributions with less than normal kurtosis are shorter than the normal distribution, but with fewer than normal returns located in the tails. In both cases, standard deviation will not accurately describe the dispersion of returns around the average. In the case of excess kurtosis, more returns will occur at the extremes than standard deviation would predict, while just the opposite would be the case if kurtosis were less than normal.

When it comes to judging the riskiness of an asset class, kurtosis and skewness have to be looked at together. The riskiest situation is one with excess kurtosis and negative skewness. In this case, you are likely to get more and larger downside surprises than you bargained for (assuming past returns are a reasonable guide, in a statistical sense, to what you can expect in the future). On the other hand, excess kurtosis also can be a good thing when skewness is positive -- in which case, you'll get more pleasant surprises than you would if the returns were normally distributed.

The final point we'd like to make before embarking on our asset class tour is that along the way we're going to be looking at how different asset classes performed during different periods of time. For example, we'll look at the 70s, 80s, and 90s, which represented periods of high, moderate, and low inflation in many countries. We'll also look at two shorter crisis period, covering the equity market crash of 1987 and the collapse of Long Term Capital Management in 1998. We'll also look at the geometric average returns different asset classes delivered over the 1971-2002 period, or the longest set of data we have available. We hope this will help you develop a better intuitive feeling for the real returns different asset classes

have delivered under varying historical circumstances. We also hope it will put into better perspective the future return estimates we will present for each asset class.

So let's begin the tour, which is organized on a scale of more or less increasing risk and return. This month, we will four different fixed income asset classes: real return bonds, investment grade bonds, high yield bonds, and foreign currency bonds. Next month, we will cover domestic and foreign property (real estate), commodities, domestic, foreign, and private equity, and absolute return (also known as hedge fund) strategies. We will conclude with a discussion of the models we use to combine these different asset classes into model portfolios, and summarize the results of these efforts.

Real Return Bonds

Fixed income investments potentially expose you to __ different types of downside risk. The first type is usually called market risk. Because the future stream of cash flows you receive when you buy a bond is fixed (i.e., the coupon payment on most bonds doesn't change over time), an increase in interest rates will cause the present value of the bond to decline (that is, the amount for which you could sell the bond today will decline in value when interest rates rise). This decline in the value of your capital also reduces the total rate of return you receive on your investment. For example, if a bond with a coupon of five percent experiences a n eight percent loss due to a rise in interest rates, your total return on it would be negative three percent. Two underlying factors can cause market interest rates to increase: a rise in inflation, or a rise in real interest rates. There are a number of ways you can limit your exposure to downside market risk. First, you can invest in bonds with shorter rather than longer maturities. All else being equal, the longer the maturity of a bond, the bigger the reduction in its present value that will result from a rise in interest rates. Of course, the flip side of this statement is also true: if interest rates decline, bonds with longer maturities will experience a larger increase in value than bonds with shorter maturities.

The other way you can protect yourself from market risk is to find a way to eliminate your exposure to changes in the rate of inflation. Until recently, this was very difficult to do. However, in the past decade, more and more governments have begun to issue what are

known generically as “real return bonds” (e.g., TIPS or Series I Savings Bonds in the U.S.). In the UK, these are known as “index-linked bonds.” The unique feature of these instruments is that investors are guaranteed to receive a constant real rate of return if inflation increases. Depending on the way the bond is structured, they may even provide some protection against deflation. For example, in the United States, Treasury Inflation Protected Securities (TIPS) guarantee that the principal value of the bond (which is adjusted with inflation) will not fall below its face value, even if a prolonged period of deflation suggests that this is what should be done to maintain its real return. As a result, the real return on these bonds would actually rise during a prolonged deflation, though not by less than the rise in real return on investment grade bonds (see below). To put it slightly differently, real return bonds protect both principal and interest against inflation, and (depending on their structure) sometimes principal against deflation. By comparison, nominal return bonds (that is, any bond that isn’t a real return bond) protect neither principal nor interest payments against inflation, but protect both of them against deflation.

On the other hand, real return bonds still leave an investor exposed to changes in the real rate of interest. For example, during periods when the economy is growing quickly, demand for capital and real rates of interest can rise, causing the capital value of real return bonds to fall. The opposite can happen during recessions. Still, because they eliminate some, but not all of the risk associated with a change in nominal interest rates (which can be caused by changes in expected inflation and/or real rates), real return bonds should be less volatile (that is, have lower standard deviations) than nominal bonds of comparable maturity.

Real Return Bonds are currently available in five of the six functional currencies covered by The Index Investor. They were first issued by the government of the UK in 1981, Australia in 1985, Canada in 1991, Sweden in 1994, the US in 1997 and France in 1998. So far, Japan has not issued any (which is logical, as they are in a prolonged period of deflation). Current real yields on these instruments are quite closely grouped (reflecting a highly efficient global fixed income market), and range from 2.92% in Canada to 1.79% in the Eurozone. The average yield for all five regions is 2.33%.

Looking more closely at TIPS in the United States, their arithmetic average annual real return since they were first issued in 1997 has been 3.89% (through the end of 2002). The standard deviation of these returns is 4.27%. This is lower than the standard deviation on the different types of nominal bonds we will look at, but it is not zero; there is still some risk in holding real return bonds. Since they have been issued, returns on TIPS have had a low correlation with the returns on other asset classes; in other words, they provide substantial diversification benefits to a portfolio. However, the skewness and kurtosis of the return distribution for TIPS are not pretty. The former is (.52), while the latter is high at 3.11. In other words, since they were first issued six years ago, there have been more and bigger negative real return surprises than positive ones for holders of TIPS. Frankly, we think these data vastly overstate the risk of holding TIPS. They seem to reflect two factors, only one of which will persist in the future.

As we have mentioned, the factor that will persist is changes in the real rate of interest over the business cycle. In this regard, a point to keep in mind is that since real return bonds first introduced in the United States in 1997, the economy has generally been growing, and most of the surprises have therefore been on the downside (that is, increases in the real rate of interest). This may have exaggerated the statistical riskiness of this asset class. The factor that will change is the excess volatility associated with the introduction of this asset class, and investors' initial learning process. For example, real return bonds have been since 1981 in the United Kingdom, and the skewness and kurtosis of their returns are more in line with other government bonds (that is, positively skewed, with low kurtosis).

In light of all these considerations, the estimate of future risk and returns that we will use in our asset allocation models for real return bonds is an annual real arithmetic return of 2.50%, and a standard deviation of 2.50%. So, to summarize the pros and cons of investing in this asset class:

Market Condition:	**Normal**	**Inflation**	**Deflation**
Reasons to Invest in Real Return Bonds	· Constant real return · Very low return volatility · Low correlation with other asset classes	· Both interest payments and principal are protected; real returns won't decline	· Capital value is protected
Reasons Not to Invest in Real Return Bonds	· Other asset classes provide higher returns · Strong growth could lead to rising real rates and lower total returns	· Hard to think of a reason not to have these in your portfolio during high inflation	· Interest payments aren't protected, and will decline. · Total real rates of return (interest payments plus change in capital value) will be higher on nominal bonds

Investment Grade Bonds

In addition to market risk, investors in fixed income instruments may also take on credit risk (that is, the risk that the issuer of the bond will default, and you will lose your capital value). To help investors judge this risk, most bonds are rated by a credit rating agency. Typically, bonds receiving the top four ratings (e.g., AAA, AA, A, and BBB) are considered "investment grade", while those with lower ratings are politely called "high yield", and less politely called "junk bonds." Theoretically, the only bonds that don't have any credit risk are those issued by governments, since governments don't go bankrupt. However, history has proven that some governments do go out of business (reluctantly, and usually with a lot of bloodshed), which, from a bondholder's perspective, is the same thing. So, to be more accurate, the lack of credit risk associated with government bonds is only guaranteed for the time horizon over which you believe you can predict potentially disastrous political events.

Broadly speaking, there are three types of investment grade bonds. The first are issued by governments. The second are issued by corporations, but not secured by any assets (technically, these are known as debentures). The third are bonds secured against assets, the most common of which are mortgage bonds (though the volume of other "asset-backed bonds" secured against things like credit card receivables has been growing in recent years).

As previously noted, investment grade bonds are particularly attractive during deflationary periods, which increases the real value of both the interest and principal payments received by bondholders (assuming said gains aren't offset by increasing defaults brought on by deflation). During inflationary periods, the real value of bond interest (assuming fixed payments) and principal declines, and bondholders sometimes earn negative real returns (particularly if they hold long term instruments). In normal periods, with low inflation and steady GDP growth, bondholders generally earn total returns that lag behind those on other asset classes.

The following table clearly illustrates these differences. It shows the geometric average real returns earned by bondholders in different currencies during three very different decades of time. The seventies were a period of high inflation, the eighties moderate inflation, and the nineties low inflation (including deflation in Japan). The final two columns show the real returns earned over two very troubled quarters: the fourth quarter of 1987, which included the global equity market crash, and the third quarter of 1998, which included the global liquidity crisis associated with the collapse of the Long Term Capital Management hedge fund.

Real Domestic Investment Grade Bond Returns Under Different Conditions

Geometric Annual Returns for Decades, Quarterly Returns for Quarters.

	1970s	1980s	1990s	4Q 1987	3Q 1998
A$	(5.5%)	2.4%	8.8%	.3%	3.6%
C$	(1.6%)	6.4%	9.3%	5.6%	3.7%
DM/Euro	1.9%	4.7%	5.1%	3.9%	4.5%
Yen	(2.3%)	6.7%	5.4%	7.4%	4.4%
GB £	(4.4%)	7.5%	8.9%	5.4%	7.4%
US $	(1.7%)	7.2%	6.7%	4.6%	3.4%

Source: Triumph of the Optimists (Dimson, Marsh, Staunton), and Index Investor calculations

This table demonstrates two of the great truisms in the bond business: first, falling rates are your friend. For example, in the United States, the nominal yield on ten year Treasury Bonds has fallen from 15.32% in September, 1981 to 3.96% at the end of April, 2003, creating a bull market in bonds that has lasted longer than its equity market counterpart. The second truism is that investment grade bonds (and especially government bonds) tend to benefit when things hit the fan, and investors move their funds into low risk assets (also known as a "flight to quality").

It is equally informative to look at the distribution of real returns on different domestic bond indexes over the entire 1971 to 2002 period. The following table shows arithmetic average annual returns, standard deviations, skewness and kurtosis for these indexes.

Real Domestic Bond Returns 1971 to 2002

	Average Annual Return	Standard Deviation	Skewness	Kurtosis
A$	3.94%	9.85%	(.22)	2.38
C$	4.28%	7.64%	.32	4.15
DM/Euro	4.62%	5.06%	(.30)	1.06
Yen	3.58%	5.56%	(.44)	3.22

	Average Annual Return	Standard Deviation	Skewness	Kurtosis
GB £	4.13%	9.70%	.26	1.53
US $	3.82%	5.40%	.41	4.20

This table is interesting for a number of reasons. First, it shows that the real average annual return on investment grade domestic bonds over the past thirty-two years has been roughly the same across six major markets. At the very least, this suggests that those markets operate quite efficiently. Second, the fact that Australia and the UK experienced higher levels of inflation in the seventies and eighties than the other two areas shows up clearly in the higher standard deviations for these two currencies. Finally, the table helps to illustrate our earlier point about risk being a concept that is hard to capture using a single statistic. The standard deviations of returns are about the same for DM/Euro and Yen bonds. If that was the only statistic you had available, you might say they were equally risky. You wouldn't say this, however, if you could also examine their skewness and kurtosis. As you can see, Yen bonds were more likely to have returns below their average, and these were more likely to be bigger than was the case for DM/Euro bonds. In short, after examining all three statistics, it becomes clear that the Yen bonds were riskier to hold over the 1971-2002 period.

If you assume that the lowest risk asset in any market is a real return bond issued by the government, you can estimate the future return on other domestic fixed income assets by adding a spread to the real return bonds that reflects the increased riskiness of the asset whose future return you are estimating. In this case, to estimate the future real annual return on domestic investment grade bonds, we have added 1.50% to the estimated future return on real return bonds. This yields an estimated real return of 4.00% per year. For the standard deviations, we will use the data from 1971-2002, as this period contains a fairly wide mix of different market conditions.

So, to summarize the pros and cons of investing in this asset class:

Market Condition:	**Normal**	**Inflation**	**Deflation**
Reasons to Invest in Domestic Investment Grade Bonds	· Relatively low return volatility · Relatively low correlation of returns with other asset classes. · Potentially high short term (e.g., quarterly) returns in times of crisis that trigger "flight to quality."	· Hard to think of one.	· Both interest payments and capital values increase in real terms
Reasons Not to Invest in Domestic Investment Grade Bonds	· Other asset classes provide higher returns	· Avoid declines in the real value of interest and principal payments.	· Credit quality may be adversely affected (stick to government bonds).

High Yield Bonds

High yield bonds carry more credit risk than investment grade bonds. When times are difficult, they are more likely to default. As a result, the real returns they produce tend to go down when economic conditions worsen. In this regard, they are similar to equities, and unlike other domestic bonds. This is supported by the statistical data. For example, in the United States between 1971 and 2002, the correlation of real annual returns between the equity market (measured by the Wilshire 5000 Index) and the investment grade bond market was .22, while the correlation between equities and high yield bonds was .56.

Here is some additional data about the real returns on this asset class in the United States, in comparison to investment grade bonds and equities.

Real Returns 1971 to 2002 in the United States

	Average Annual Return	Standard Deviation	Skewness	Kurtosis
Domestic Investment Grade Bonds	3.82%	5.40%	.41	4.20
Domestic High Yield Bonds	4.40%	9.01%	(.31)	3.63
Domestic Equities	7.26%	16.29%	(.49)	1.96

This table makes some key points about domestic high yield bonds as an asset class. Statistically, they look more like equity than like debt. More to the point, their standard deviation probably understates their relative riskiness, as their returns are negatively skewed with unusually fat tails. In other words, big downside surprises are much more likely than with investment grade bonds. Because these downside surprises are likely to happen when the economy is declining and equities are also turning down, we are left with a simple question: why would you want to invest in high yield bonds instead of equities?

We should also note that the same arguments can be made for emerging market bonds, which are basically the international equivalent of domestic high yield bonds. Most emerging market bonds have been issued in U.S. dollars, and, like their domestic counterparts, their limited track record seems to suggest that they are highly volatile and also likely to generate negative returns when equity markets are turning down.

Our arguments in favor and against the use of high yield bonds can be summarized as follows:

Market Condition:	**Normal**	**Inflation**	**Deflation**
Reasons to Invest in High Yield Bonds	· Modest correlations with most asset classes. Highest (for US) are .56 with US equities and .43 with European equities.	· Hard to think of one.	· Both interest payments and capital values increase in real terms
Reasons Not to Invest in High Yield Bonds	· Equity provides higher returns with similar degree of risk.	· Avoid declines in the real value of interest and principal payments.	· Credit quality of these bonds lower to begin with, and default rate may rise rapidly in a downturn.

Foreign Currency Bonds

Investment grade foreign currency bonds provide some very attractive diversification benefits to a portfolio. The key difference between this asset class and domestic investment grade bonds is the inclusion of currency risk. In calculating the total return received on a foreign currency bond, it is not just the interest payments received and change in the market price of the bond which matter, but also changes in the exchange rate between the investor's home currency and the currency in which the bond is denominated. The good news is that by holding a portfolio of foreign bonds that are denominated in a range of currencies (not including the home currency), bond funds can, to some extent, reduce this currency risk. Time also helps reduce currency risk, as over long periods exchange rate gains and losses tend to net themselves out, leaving similar real returns across countries (as we saw in our discussion of domestic investment grade bonds in different markets).

The following table shows statistics for foreign bond returns which reinforce these points.

Real Foreign Bond Results, 1971-2002

	Average Annual Return	Standard Deviation	Skewness	Kurtosis	Correl. With Domestic Equity Market	Correl. With Domestic Bond Market
A$	7.1%	16.7%	(.03)	.56	(.17)	.14
C$	9.9%	8.7%	.28	.54	(.05)	.35
DM/Euro	6.3%	9.1%	.17	2.21	.36	.21
Yen	5.7%	9.8%	(.37)	1.47	(.01)	.05
GB £	9.2%	9.2%	.47	1.91	.13	.05
US $	9.5%	11.2%	.51	.72	.09	.19

*Indexes based on IMF Long-Term Government Bond Yield data, with weights based on current relative weights in Salomon Brothers World Government Bond Index.

Generally speaking, across a range of currencies, foreign bonds as an asset class have very attractive statistical properties. Foreign bonds' low correlation of returns with domestic equities and bonds is of particular interest. Research has shown that the correlation of returns between domestic and foreign equity markets tends to vary over time, increasing when they are declining, and decreasing when they are rising. This has caused a number of authors to conclude that the "effective" amount of diversification benefits one receives from investing in foreign equities is lower than it first appears. A key question is whether or not this is also the case with bonds. A recent research paper ("Asymmetric Dynamics in the Correlations of Global Equity and Bond Returns" by Cappiello, Engle, and Sheppart) shows that bonds behave very differently from equities in this regard. They found that the linkages across bond markets were much weaker than the linkages across equity markets, and the lowest correlations in their study were between equity returns in one region (e.g., Asia, North America, and Europe) and bond returns in another. Finally, they noted how the "flight to quality" phenomenon tended to maximize diversification benefits just when they most needed, as equity-bond correlations tend to decrease during periods of financial turmoil.

To check this point, we looked at how foreign currency bonds had performed during the same periods we used for our analysis of investment grade bonds.

Real Foreign Currency Bond Returns Under Different Conditions

Geometric Annual Returns for Decades, Quarterly Returns for Quarters.

	1970s	1980s	1990s	4Q 1987	3Q 1998
A$	2.0%	10.9%	9.6%	12.8%	12.8%
C$	4.5%	5.2%	8.5%	13.4%	13.4%
DM/Euro	(2.5%)	7.5%	11.8%	(2.0%)	.01%
Yen	(4.1%)	5.6%	4.7%	4.3%	6.5%
GB £	2.7%	8.6%	8.8%	(0.6%)	5.6%
US $	4.3%	6.6%	4.0%	23.5%	9.2%

Source: Index Investor calculations

As you can see, foreign currency bonds as an asset class have performed well, across a range of home currencies, time periods, and market conditions. In particular, real returns for this asset class have generally performed well when inflation was high.

So, if history is a useful guide the future, we conclude that foreign currency bonds are an attractive asset class. A more difficult challenge is developing an estimate of the future average annual real returns they are likely to deliver, and how volatile these are likely to be. One approach is to take the historical average spread of foreign currency over domestic investment grade bonds, and add that to our estimated future return of 4% for the latter. A slightly different approach is to use the average spread over investment grade bonds across six countries, which is about 4%. This results in an estimated average future return of about 8% per year. A third approach is to assume that current inflation differentials between countries (estimated from their nominal government bond yield curves) will drive future exchange rate changes, and then use these to (using relative weights in the Salomon Brothers World Government Bond Index) estimate future foreign bond return differentials versus domestic investment grade bonds. This yields spread estimates ranging from 1.85 from the perspective of an Australian dollar based investor, to 7.1% from the perspective of a Yen-based investor

(with an overall average incremental spread over domestic bonds of 3.2%). All of these approaches are highly uncertain. However, assuming that we should use the information available to us in current yield curves, we will add 3% to our domestic bond return estimate to produce our estimated annual real return of 7% on foreign currency bonds. To be consistent, for standard deviations we will use the actual results for each country for the 1971-2002 period.

Our arguments in favor and against the use of the foreign currency bonds asset class can be summarized as follows:

Market Condition:	**Normal**	**Inflation**	**Deflation**
Reasons to Invest in Foreign Currency Bonds	· Low to negative correlations with domestic bond and equity markets · Good protection from adverse event risk	· Real returns have among the lowest correlations with inflation across all six currencies. Only comparable asset classes are commodities and real estate	· If real yields are higher in foreign currencies, the latter should appreciate and foreign bond holders benefit.
Reasons Not to Invest in Foreign Currency Bonds	· High volatility compared to domestic bonds can offset benefit of low correlation	· If your country has the lowest inflation rate, your currency will appreciate, and foreign currency bond returns will suffer	· If home country real yields are higher than foreign, currency will appreciate, hurting returns on foreign bonds