The Index Investor

Invest Wisely…Get an Impartial Second Opinion.

Contents

This Month's Issue: Key Points

This month's feature article starts with a question that has become depressingly common at social gatherings around the world: "So, are you in hedge funds and private equity?" If you've ever wondered how to answer this question, we've got answers for you. We begin with a description of the way arbitrage, directional, and market neutral hedge funds theoretically generate their returns. We then do the same for buyout and venture capital funds, that together constitute "private equity." We go on to examine the historical returns they have delivered in the past, taking into account the many limitations that underlie these data. We find that what we consider the best research available concludes that, in aggregate, private equity returns have quite high correlations with returns on the public equity market. Buyout fund returns (after manager expenses) have been about equal to those in the public equity market, with about the same level of risk. Long-term aggregate venture capital fund returns have been about four percent higher than public equity, but with twice the risk, as measured by standard deviation. This suggests that allocations to venture capital should only

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be found in portfolios with quite high return objectives. We also look at aggregate hedge fund returns (as well as returns on two key sub-styles, Equity Market Neutral and Global Macro) and find that historically, they have provided an attractive complement to other asset classes.

However, we also note that, even in relatively inefficient markets, alpha is still a zero sum game, and raises all the questions about active management (e.g., an investor's ability to identify skilled managers) that are found in the mutual fund world. This is a particularly acute problem in the world of hedge funds and private equity, where there are very big differences between the returns earned by top managers and those earned by the average manager. Under these circumstances, most investors should logically prefer to invest in hedge funds via low cost index (actually, funds of funds) products. We find that, around the world, a growing number of these are available. To the extent that they can provide additional returns with low correlations with existing asset classes, small allocations to these new hedge fund index products may be a valuable addition to investors' portfolios.

This month's product and strategy notes look at a number of interesting issues, including the launch of new commodity and hedge fund products, a new "all weather" fund in Australia, the true fees actively managed funds charge for the their active management services, and new data showing that most of them have underperformed the relevant index over the past five years.

This Month's Letters to the Editor

Are there alternatives to the T. Rowe Price International Bond Fund that can be used to implement an allocation to the non-dollar bonds asset class?

Unfortunately, an index fund that tracks a non-U.S. dollar bond index is not yet available in the United States. Hence, we have had to choose from among a number of actively managed funds that invest in international bonds. Our criteria have included (a) the absence of a front end load; (b) a low expense ratio; (c) no or minimal hedging of foreign currency exposure, and (d) tracking error versus the Salomon Brothers non-U.S. dollar 1+ year maturity government bond index (or the JP Morgan equivalent). Our historical recommendation has been the T. Rowe Price fund (RPIBX). We have recently expanded this to include PIMCO's

ISSN 1554-5075

new unhedged foreign currency bond fund (PFUAX), which has an expense ratio of .80 (as in the case of the PIMCO commodity fund, PCRDX, we assume people can access this fund via a mutual fund supermarket program that avoids payment of the front end load). We have also recently added the American Century International Bond Fund (BEGBX) to this group. Its expense charge is .83, and it has a similar ratio of 3 year return/3 year standard deviation (risk) to RPIBX (however, it achieves it via somewhat higher returns and volatility).

Another fund we are frequently asked about is the Oppenheimer International Bond Fund (OIBAX). This carries a hefty 4.75% sales load, and an annual expense charge of 1.13%. Readers like to note that it has a more impressive return/risk ratio than the funds we recommend. In reply, we note that this is accomplished via much higher return and risk, due in no small part to OIBAX's inclusion of emerging markets debt in its portfolio, and more aggressive use of currency hedging. There are also a larger number of "global" or "world" income or bond funds that invest in a mix of U.S. dollar and non-USD securities. Because these are not the same as our allocation to foreign (non-dollar) bonds, we do not use them to implement our allocations to this asset class. By all means, if you have come across an interesting fund that we have missed, please let us know. Among all the asset classes we use, foreign bonds is probably the most frustrating in terms of the limited number of (non-indexed) products available.

Does the Schwab OneSource program offer funds in all the asset classes you use in your model portfolios?

I should start by reiterating what we say in our writing: that, if we had to choose one or the other, we'd rather get our asset allocation right and implement it through actively managed funds than get it wrong but implement it through index funds. Ideally, of course, we want to get our allocation right and implement it at low cost via index products. However, these aren't always available in a given retirement plan.

That being said, Schwab's supermarket program (OneSource) offers products in all of the asset classes we use. Here are a few of them: Real Return Bonds (American Century Inflation Protected Bond fund, ACITX); Domestic Bonds (Pimco Total Return PTTDX); Foreign Bonds (T. Rowe Price, RPIBX, Pimco, PFBDX); Commercial Property (Cohen and

ISSN 1554-5075

Steers, CSRSX); Commodities (both Oppenheimer QRAAX and PIMCO, PCRDX), Domestic Equity (Dimensional Fund Advisors index funds), Foreign Equity (JP Morgan International Index, also DFA funds), and Emerging Equity (State Street Global Advisers and DFA funds).

ISSN 1554-5075

Global Asset Class Returns

YTD 29Jul05	In USD	In AUD	In CAD	In EURO	In JPY	In GBP
Asset Held						
US Bonds	1.50%	4.54%	3.77%	12.15%	10.09%	9.80%
US Prop.	13.60%	16.64%	15.87%	24.25%	22.19%	21.90%
US Equity	3.80%	6.84%	6.07%	14.45%	12.39%	12.10%
AUS Bonds	-1.22%	1.82%	1.05%	9.43%	7.37%	7.08%
AUS Prop.	-1.68%	1.36%	0.58%	8.96%	6.90%	6.61%
AUS Equity	7.84%	10.88%	10.11%	18.49%	16.43%	16.14%
CAN Bonds	3.12%	6.16%	5.39%	13.77%	11.71%	11.42%
CAN Prop.	12.94%	15.98%	15.21%	23.58%	21.52%	21.23%
CAN Equity	11.10%	14.14%	13.37%	21.75%	19.69%	19.40%
Euro Bonds	-6.53%	-3.49%	-4.26%	4.12%	2.06%	1.77%
Euro Prop.	12.80%	15.84%	15.07%	23.45%	21.39%	21.10%
Euro Equity	2.45%	5.49%	4.72%	13.10%	11.04%	10.75%
Japan Bonds	-7.40%	-4.36%	-5.13%	3.25%	1.19%	0.90%
Japan Prop.	-2.78%	0.26%	-0.51%	7.87%	5.81%	5.52%
Japan Equity	-6.14%	-3.10%	-3.87%	4.51%	2.45%	2.16%
UK Bonds	-4.39%	-1.35%	-2.12%	6.26%	4.20%	3.91%
UK Prop.	-5.98%	-2.94%	-3.71%	4.67%	2.61%	2.32%
UK Equity	0.06%	3.10%	2.32%	10.70%	8.64%	8.35%
World Bonds	-2.40%	0.64%	-0.13%	8.25%	6.19%	5.90%
World Prop.	8.77%	11.81%	11.04%	19.42%	17.36%	17.07%
World Equity	3.35%	6.39%	5.62%	14.00%	11.94%	11.65%
Commodities	10.10%	13.14%	12.37%	20.75%	18.69%	18.40%
Timber	6.06%	9.10%	8.32%	16.70%	14.64%	14.35%
Hedge Funds	1.11%	4.15%	3.38%	11.76%	9.70%	9.41%
Volatility	-12.94%	-9.90%	-10.67%	-2.30%	-4.36%	-4.64%
A$	-3.04%	0.00%	-0.77%	7.60%	5.55%	5.26%
C$	-2.27%	0.77%	0.00%	8.38%	6.32%	6.03%
Euro	-10.65%	-7.60%	-8.38%	0.00%	-2.06%	-2.35%
Yen	-8.59%	-5.55%	-6.32%	2.06%	0.00%	-0.29%
UK£	-8.30%	-5.26%	-6.03%	2.35%	0.29%	0.00%
US$	0.00%	3.04%	2.27%	10.65%	8.59%	8.30%

ISSN 1554-5075

Equity and Bond Market Valuation Update

Our market valuation analyses are based on the assumption that markets are not perfectly efficient and always in equilibrium. This means that it is possible for the supply of future returns a market is expected to provide to be higher or lower than the returns investors logically demand. In the case of an equity market, we define the future supply of returns to be equal to the current dividend yield plus the rate at which dividends are expected to grow in the future. We define the return investors demand as the current yield on real return government bonds plus an equity market risk premium. As described in our May, 2005 issue, people can and do disagree about the "right" values for these variables. Recognizing this, we present four valuation scenarios for an equity market, based on different values for three key variables. First, we use both the current dividend yield and the dividend yield adjusted upward by .50% to reflect share repurchases. Second, we define future dividend growth to be equal to the long-term rate of total (multifactor) productivity growth, which is equal to either 1% or 2%. Third, we use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of these variables yield high and low scenarios for both the future returns the market is expected to supply, and the future returns investors will demand. We then use the dividend discount model to combine these scenarios, to produce four different views of whether an equity market is over, under, or fairly valued today. These estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation:

Australia	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	71%	106%
Low Supplied Return	108%	148%

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Canada	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	108%	176%
Low Supplied Return	202%	292%

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ISSN 1554-5075

Eurozone	Low Demanded Return	High Demanded Return
High Supplied Return	57%	104%
Low Supplied Return	106%	164%

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Japan	Low Demanded Return	High Demanded Return
High Supplied Return	73%	165%
Low Supplied Return	197%	332%

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United Kingdom	Low Demanded Return	High Demanded Return
High Supplied Return	56%	97%
Low Supplied Return	98%	146%

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United States	Low Demanded Return	High Demanded Return
High Supplied Return	113%	183%
Low Supplied Return	211%	304%

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:

ISSN 1554-5075

	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	2.56%	2.96%	5.52%	5.14%	-0.38%	3.69%
Canada	1.87%	2.40%	4.27%	3.87%	-0.40%	3.92%
Eurozone	1.30%	2.37%	3.67%	3.24%	-0.43%	4.19%
Japan	0.69%	0.77%	1.46%	1.32%	-0.14%	1.36%
UK	1.57%	3.17%	4.74%	4.31%	-0.43%	4.16%
USA	1.92%	2.93%	4.85%	4.29%	-0.56%	5.47%

It is important to note some important limitations of this analysis. First, it uses the current yield on real return government bonds. Over the past forty years or so, it has averaged around 3.00%. Were we to use this rate, bond markets would generally look even more overvalued. It also uses historical inflation as an estimate of expected future inflation. This may not produce an accurate estimate.

Second, 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, which would make non-government bonds appear even more overvalued.

Third, if one were to assume a very different scenario, involving a prolonged recession, accompanied by deflation, then one could argue that government bond markets are actually undervalued.

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

ISSN 1554-5075

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%	-1.27%	-1.90%	-3.82%	-0.83%	-0.85%
C$	1.27%	0.00%	-0.63%	-2.55%	0.44%	0.42%
EU	1.90%	0.63%	0.00%	-1.92%	1.07%	1.05%
YEN	3.82%	2.55%	1.92%	0.00%	2.99%	2.97%
GBP	0.83%	-0.44%	-1.07%	-2.99%	0.00%	-0.02%
US$	0.85%	-0.42%	-1.05%	-2.97%	0.02%	0.00%

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

ISSN 1554-5075

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 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.

ISSN 1554-5075

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

YTD 29Jul05

Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style Rotation	Growth (IWZ) **3.26%**	Value (IWW) **4.68%**	Value (IWW) **4.68%**	Growth (IWZ) **3.26%**
Size Rotation	Small (IWM) **5.50%**	Small (IWM) **5.50%**	Large (IWB) **4.31%**	Large (IWB) **4.31%**
Style and Size Rotation	Small Growth (DSG) **6.57%**	Small Value (DSV) **4.92%**	Large Value (ELV) **2.34%**	Large Growth (ELG) **0.74%**
Sector Rotation	Cyclicals (IYC) **1.12%** Technology (IYW) **0.59%**	Basic Materials (IYM) **-1.16%** Industrials (IYJ) **-0.48%**	Energy (IYE) **27.90%** Staples (IYK) **2.56%**	Utilities (IDU) **16.51%** Financials (IYF) **11.82%**
Bond Market Rotation	High Risk (VWEHX) **1.70%**	Short Maturity (VBISX) **0.40%**	Low Risk (VIPSX) **0.50%**	Long Maturity (VBLTX) **4.70%**

ISSN 1554-5075

Should You Be in Hedge Funds and Private Equity?

Most of us have all had a similar experience. Maybe it was back in the 80s, when leveraged buyout funds first made their appearance. Maybe it was back in the 90s, when everyone wanted a piece of the venture capital action. Or maybe it was at a party last weekend, when cousin Charlie was waxing eloquent about how he's in *both* "hedge fund" and "private equity" today. "And why aren't you?" he's bound to ask. If you've been wondering how to reply to that question, this article is for you.

Let's start with some basic definitions. At the highest level, both a "hedge fund" and a "private equity" fund are privately organized pools of capital run by a professional investment manager. At last count, there were about 10,000 hedge funds managing $1 trillion in investor funds, and 3,000 private equity funds, managing about $700 billion in assets. Of the latter, about $490 billion was invested in "buyout funds", and $210 billion in "venture capital" funds.

One of the most important features of these funds is that they are not cheap to own. In order to attract the best active managers, a typical hedge or private equity fund charges investors an annual fee equal to two percent of assets, and pays twenty percent of all returns (above a certain amount) to the fund manager. In order to justify these fees, hedge and private equity funds often make two promises to their investors. First, that their returns will be high, and second that they will have a low correlation to the returns on other asset classes. Let's begin by taking a closer look at how these funds theoretically generate the high returns they promise.

We'll begin by noting that since both hedge funds and private equity funds are actively managed products, their superior returns ultimately must be grounded in the ability of a skilled manager to make a superior forecast, in comparison to his or her competitors. In turn, these forecasts must be based on some combination of superior information and/or a superior model for making sense of the public and private information available to the fund manager.

"Hedge Funds" are not a separate asset class, per se. Rather, they are a collection of diverse investment strategies that are applied in different asset classes (e.g., bonds, equity, commodities, etc.). These investment strategies broadly fall into three categories. "Statistical

ISSN 1554-5075

Arbitrage" managers start by calculating the statistical relationship between different types of assets. When those relationships depart from historical norms, these managers attempt to profit by acquiring ("going long") the asset that they believe to be underpriced, while selling ("going short") an equal amount of the asset they believe to be overpriced. When the underlying relationship returns to its historical norm, the arbitrage manager reverses these trades to realize his or her profit. Because these price differences are typically quite small, Arbitrage funds typically use large amounts of leverage (i.e., debt) on top of their investors' funds to magnify them. Provided asset prices return to their long-term relationship, the Statistical Arbitrage strategy can make attractive returns. However, if these price relationships remain out of line – or worse, get even more out of line – then Statistical Arbitrage strategies can lose very large amounts of money, very quickly. Just ask anyone who invested in Long Term Capital Management, and watched it blow up (and almost take down the banking system with it) in 1998.

Now what about the argument that arbitrage funds have a low correlation to returns on other asset classes? As long as the statistical relationships don't get too far out of line with their historical norms, the low correlation argument probably holds. However, when they get significantly out of line, it is probably because significant negative events are also taking place in other asset classes. When these events occur (e.g., the Russian debt default in 1998 that caused the spread between emerging markets debt and U.S. Treasury Bonds to dramatically widen), they will typically cause the correlation between the statistical arbitrage strategy and some asset class returns (e.g., high yield and emerging markets debt) to sharply increase.

"Directional" hedge fund seek to make profits by going long assets they have concluded are undervalued, and/or short assets they believe to be overvalued. These long and short positions could be in different asset classes (in the case of "Global Macro" funds), in one asset class (e.g., "Equity Long/Short" or "Emerging Markets" funds) or in different securities issued by companies subject to unusual events (e.g., "Event Based" or "Merger Arbitrage" funds). The hedge fund manager's valuation of these securities is typically based on some combination of fundamental analysis of the expected cash flows and risks from the assets themselves, or analysis of the expected future moves of other investors. The long and short positions are typically not offsetting; hence a directional manager has a "net long" or

ISSN 1554-5075

"net short" exposure, that tends to be correlated with the returns on the relevant asset classes. Obviously, making the wrong valuation judgment causes a Directional manager to lose money. The actual amount of money lost, however, depends on what the hedge fund has been investing in. For example, a quarter percent change in interest rates has a lot bigger impact on the value of a long-term bond than it does on the value of a short-term bond. In this example, the hedge fund manager can magnify the potential return on her interest rate forecast by changing the maturity of the bonds he or she holds. Moreover, the actual "directional bet" may itself not be a symmetrical one. For example, consider a hedge fund that invests in catastrophe bonds. These are typically issued by companies that provide insurance against low probability, but high cost events (e.g., like a hurricane). If the specified event does not occur within a given period, the bondholders receive their principal back, plus a very attractive return. However, if the event occurs, and is sufficiently costly to the insurance company, the bondholders may lose their principal. In this case, on the upside, if our Directional hedge fund manager's hurricane forecast is accurate, he and his investors will make a nice return. However, if his forecast is wrong, the downside losses can be much larger.

Finally, "Market Neutral" strategies are based on the difference between systematic risk, which is common to all securities in an asset class, and company-specific risk. A Market Neutral manager seeks to profit from his or her superior ability to analyze company-specific risk, without taking systematic (also known as "beta") risk. For example, an equity market neutral manager might invest $100 each in ten companies, while selling short a $1,000 of equity index exchange traded funds. The net return on this investment would be pure "alpha" – that is, return for taking company specific, rather than market risk. In theory, it should also be uncorrelated with the return on the underlying asset class. In practice, however, the relationship between systematic and company-specific risk is not as cut and dried as it is in theory. For example, consider an investment in a company that improves its operations to the point that it shifts from being included in a value sub-index to membership in the market's growth sub-index, at the same time that the balance of investor sentiment shifts from favoring value to favoring growth. Clearly, the return realized by a hedge fund manager who owns this stock will contain elements that are both company-specific and systematic. In short, in

ISSN 1554-5075

practice it is very hard to be perfectly equity market neutral (see, for example, "Are Market Neutral Hedge Funds Really Market Neutral?" by Andrew Patton).

One more point needs to be made, which applies to all hedge fund styles. As more money has been invested in hedge funds, the logical question to ask is how managers will seek to match their past returns in a much more competitive environment. Two answers present themselves, and neither is reassuring. The first is to make investments that involve more risk. The second is to employ more leverage to magnify the impact of declining "basic" returns. Both raise the chances of experiencing serious losses, unless an investor carefully controls his or her risk exposure.

Broadly speaking, there are two types of private equity funds. Venture capital funds invest in small companies during the early stages of their growth. Buyout funds invest in companies that are larger and have longer track records. Let's look more closely at these two return generating processes.

In their earliest stages, new companies typically obtain their financing from "F, F+F" – founders, families and friends. Venture capital funds only get involved when a company has progressed beyond this stage. Their investments are typically in the form of some type of equity (e.g., convertible preferred shares), and the companies they finance typically do not use much debt. Within our active management framework, venture capital managers hope to earn superior returns through a combination of superior information or a superior model. The former can involve superior insights into the future market for a technology, other investors' future view of companies operating in certain areas, and/or superior access to potential investments (e.g., due to a superior network or a superior brand image in the venture community). A superior model can include the venture capital firm's approach to adding value to an company in which it has invested (e.g., by helping to put together a superior management team, or bringing to bare a superior ability to manage rapid growth) or its superior ability to generate value from all the companies in its portfolio (e.g., by finding ways for them to work together). Venture capital funds realize the value of their investments through two means: by selling them to other companies ("trade sales") and by selling them to the public ("initial public offerings"). The pricing on these sales obviously depends on prevailing equity market conditions; hence the correlation between venture capital and public equity market returns should theoretically be quite high.

ISSN 1554-5075

The return generating process for a buyout fund has some similarities with venture capital, but also some important differences. Buyout funds typically invest in three types of deals: divisions being sold by another company; privately owned companies whose owners are cashing out, and public companies that are going private (i.e., where the buyout fund purchases all the target company's publicly traded shares, and de-lists it from a securities exchange). Ideally, buyout fund managers generate value for their investors through proprietary access to potential deals. However, an increasing number of deals are being sold to buyout companies via competitive auctions, so as to maximize the value realized by the seller. This has led many buyout funds to either shift their focus to markets in which they can still generate proprietary deal flow (e.g., Europe and Asia), and toward increased industry specialization, which may also yield reduced competition for deals.

Given this, the theoretical source of buyout funds' superior returns must be either other forms of superior insight and/or superior models. The former can include superior insight into future equity market trends and/or investors' preferences for companies in different sectors, or a superior model for improving an acquired company's business. The nature of the latter has been the subject of much discussion over the years. In the 1980s (when this writer was doing buyouts), the superior model was essentially based on three insights. First, many public companies were run inefficiently, with substantial room to increase cash flow by cutting costs and selling non-core assets. Second, the resulting increase in operating cash flow could be used to add more leverage to the company's balance sheet that had been used in the past, which would magnify the return on its equity. And third, too many managers lacked a sufficient equity stake in their own company.

Today, the buyout business has fundamentally changed, and theoretically become more difficult. The twin pressure of global competition and demanding shareholders have forced many public companies to become much more efficient, and much less reluctant to add leverage to their balance sheets. In addition, most senior managers today are eligible for substantial amounts of incentive linked pay. This has forced buyout funds to identify new ways of improving the operations of the companies they acquire. This logically leads to the question of what obstacles prevented these steps from being taken before these companies were acquired by the buyout fund. To be sure, there are reasonable answers to this question. In some cases, an acquired non-core division of a public company lacked access to the

ISSN 1554-5075

corporate funds needed to execute its strategy. In other cases, a family owned company might have been reluctant to take the risk associated with a more aggressive strategy. The same might have been true of the management of a public company with respect to adoption of a strategy that would have put quarterly earnings targets at risk. Or perhaps being privately owned, with clear demanding leadership from the top, improves overall execution of an already promising strategy. Whatever the logic, one thing seems clear: value creation by buyout funds is more difficult today than it was in the past.

Perhaps the best evidence for this is the change in the way that buyout funds realize the value of their investments. Traditionally this was done through either trade sales or initial public offerings, both of which generated a high correlation with returns on the domestic equity market. Today, however, buyout funds use two additional approaches to obtain cash to return to their investors. The first is sales to other buyout funds. If this raises some eyebrows (e.g., "what does the second buyout fund know that the first one didn't?"), the second approach should ring some alarm bells. This is the practice of releveraging a portfolio company to raised funds that are used to pay a special dividend to the buyout fund.

The obvious question is who is lending the money for these "leveraged recapitalizations?" The answer lies in the way the fundamental operation of debt markets has changed in recent years. In the old days (and you don't know how much it pains me to write that), buyouts were often financed with a combination of bank loans and what were then known as "junk" bonds. These are the same below-investment grade bonds that have since gone upmarket, and are now known as "high yield debt." In those days, bank loans tended to stay on bank balance sheets. One bank would arrange the loan, and syndicate pieces of it out to other banks, which would share in some of the arrangement fees. The junk bonds would also tend to stay in one place, though for a price some investment banks (e.g., Drexel) make secondary markets in them. Since these credits staid in one place, the people who approved them tended to be a bit more careful with their credit analysis, and reluctant to see deals "leveraged to the moon." Because we all knew who would end up holding the hot potato if the economy headed south.

Today, nobody is quite sure who is holding that potato. Banks now view "leveraged loans" (i.e., loans to highly indebted companies) as a trading asset. They underwrite them, and then sell them to a variety of new entities that have arrived on the scene. The first is

ISSN 1554-5075

mutual funds that invest in loans. The second is sometimes hedge funds and other institutional loan investors. But the third is the most interesting. These are the special purpose vehicles that use the same basic structure popularized two decades ago in the mortgage market by Salomon's Lou Ranieri. These vehicles buy loans, and then issue different classes of security based on the loan cash flows. These securities are known as "collateralized debt obligations". Each CDO class has a different risk/return profile. The most senior security might carry a AAA rating. The next class might be subordinated, and carry a below-investment grade rating. And at the bottom there is a so-called "equity tranche" that earns high returns if everything goes right, and gets very badly hurt if things go wrong. In many deals, there is a parallel structure with respect to the bonds issued by the company owned by the buyout fund. When you think it through, the key to these leveraged recapitalizations is the buyer of the CDO equity tranche. Who are they? Who would take this kind of a risk? If you guessed hedge funds, the betting line is that you are right on target. Now why might they so like CDO equity tranche deals?

As we've already mentioned with respect to catastrophe bonds, these deals offer very high returns as long as everything goes right. That's undoubtedly reason number one. But reason number two is probably due to another interesting development: the birth and rapid growth of a derivative market for trading credit risk. Credit default swaps (and options on them) theoretically enable the owner of a CDO equity tranche to manage his or her fund's exposure to the underlying credit risk by purchasing insurance in what is assumed to be a liquid derivative market. So far, so good. Except for one nagging question: who is on the other side of those credit derivative trades? Some people say it's mostly hedge funds. Others say a lot of banks are involved too. One thing is for sure: the credit risk didn't disappear. A lot of people also wonder about how much leverage is being used by those institutions who are holding it, either in the form of CDO equity tranches they have bought or credit derivative contracts they have sold. But the most interesting part is that nobody really knows the answer to these questions. So while few doubt that a lot of heavily leveraged companies that have been "recapitalized" by buyout funds will eventually run into problems, the really interesting question is the nature of the overall impact on the system that will be triggered when they do.

ISSN 1554-5075

Some very smart people are worried about this. For example, in their recent paper "Systematic Risk and Hedge Funds," Chan, Getmansky, Haas and Lo conclude that "the hedge fund industry may be heading into a challenging period of lower expected returns, and that systematic risk is currently on the rise." Similarly, in its March, 2005 Quarterly Review ("Time Varying Risk Exposures and Leverage in Hedge Funds"), the Bank for International Settlements concluded that "painting a comprehensive picture of the hedge fund industry is virtually impossible given the data available." It also found that "hedge funds that reportedly belong to different style families, and thus presumably follow different investment strategies, have at least some commonality in their risk exposures." Moreover, "to the extent that hedge funds engage in investments that have payoffs that resemble derivative instruments, their returns will be non-linearly related to the returns on the underlying market risk factors."

Let's now move on to another point that is too often overlooked in the excitement over the prospective returns from investing in hedge funds and private equity (which remind us of Charles Revson's comment about the cosmetics business: "we're selling hope."). Most studies show that in the world of hedge, buyout, and venture capital funds, the difference between top and bottom quartile managers' returns is quite large. This is taken as evidence of "inefficiency," or substantial differences in managers' skill and access to information. However, even in inefficient markets, alpha is still a zero sum game. This is an important point that investors too often overlook. Mathematically, there is a weighted-average return from investing in the universe of all hedge, buyout, or venture capital funds, that is ultimately related to the amount of systematic (i.e., beta) risk they bear. In any year, some funds will deliver returns above this average (generating positive alpha) while others will deliver returns below it (negative alpha).

Investors in hedge, buyout and venture capital funds face the same challenges as investors in actively managed mutual funds: How to identify truly skilled investment managers? And how to be sure that these managers will not capture (via fees and expenses) all the alpha they create? As you know, this implies a successful forecast on the part of the investor choosing from multiple hedge, buyout and venture capital fund managers. And any manager selection forecasting skill necessarily depends on the investor having either superior information and/or a superior model. Paying an investment consultant (or, alternatively, a "fund of fund" manager, which makes sub-investments in a number of hedge, buyout, or

ISSN 1554-5075

venture capital funds) to make this choice only changes the nature of the forecasting problem (while making it more expensive for the investor). However, the forecasting problem does not go away.

If there is any good news, it is that in the world of hedge and private equity funds, (and unlike the world of mutual funds), past performance may be a useful guide to future results. For example, in "The Life Cycle of Hedge Funds", Mila Getmansky found that for most hedge fund categories, performance increased with size, but at a decreasing rate. One reason for this is provided in the paper "Analyst Industry Diversification and Earnings Forecast Accuracy" by Dunn and Nathan. They found that as analysts covered a broader range of industries, their forecasting accuracy declined. To put it differently, what has been called the "fundamental law of active management" states that alpha is a function of forecasting skill times the number of opportunities for its application. Dunn and Nathan's findings suggest that this may need to be modified, given the apparent negative relationship between these two variables (a point that is also consistent with many findings from cognitive psychology research). In other words, while big and successful funds may benefit from better access to deal flow, increased size may actually cause their forecasting skills to weaken.

Further evidence for this is found in the paper, "Private Equity Performance: Returns, Persistence, and Capital Flows", by Kaplan and Schoar. They found that managers of previously successful funds were more likely to raise follow-on funds, and to earn above average returns. They hypothesize that this is due to proprietary deal flow and differentiated fund manager skill. They also found that new funds started during cyclical booms were the ones most likely to earn low returns (probably because booms attract marginal or unskilled managers into the hedge and private equity funds business).

To answer the second question – the probability of earning risk adjusted returns (after those hefty manager fees) greater than those available in publicly traded asset classes – we must turn to the thorny question of how to measure hedge and private equity fund performance.

The first issue is the level at which the analysis is being done. Conceptually, this can occur at the level of portfolio companies, the individual funds, or the aggregated results for all hedge, buyout, or venture capital funds. Each level of analysis produces its own insights. For example, in his paper "The Reality of IPO Backed Performance", Yochanan Shachmurove

ISSN 1554-5075

analyzed the returns realized on 2,895 venture-backed public companies between 1968 and 1998. This sample is itself somewhat skewed, because perhaps only 20% of the companies in which venture funds invest ever make it to the public markets. The following table shows average and median nominal returns, as well as return breakpoints and standard deviations for both companies that were still trading in 1998, and those that were inactive (due to bankruptcy or having been acquired).

	All Companies	**1,401Active Companies**	**1,494 Inactive Companies**
Median Annual Return	(100.0%)	(5.6%)	(100.0%)
Average Annual Return	(45.3%)	(7.6%)	(80.7%)
Standard Deviation of Returns	99.6%	126.2%	41.3%
99th percentile return	173.8%	359.8%	61.0%
95th percentile return	42.2%	72.7%	10.3%
90th percentile return	21.9%	39.7%	(8.5%)
75th percentile return	0.2%	12.6%	(100.0%)

As Shachmurove notes, "while the media focused on a few big IPO success stories, rather than being typical they were highly unusual in the historical context." Others have noted that venture capital funds in essence invest in a portfolio of options, since most of their investments fail, while a few deliver sometimes spectacular returns.

The aggregate indexes for hedge, buyout and venture capital fund performance all suffer from substantial shortcomings. The first is the so-called "self-selection bias." This refers to the fact that funds report their returns voluntarily. Logically, this probably biases the results towards the more successful funds. This problem is compounded in the hedge fund world, where funds report to different competing index providers (in the private equity world, the problem seems less severe, with Venture Economics having a substantial market share).

ISSN 1554-5075

The second problem is known as the "backfill bias." This refers to the fact that when a fund joins an index, it provides a year or two of previous returns. Research has shown that subsequent results are almost always lower. Hence, if backfilled data are included, index average returns will be biased upwards.

The third problem is the "survivorship bias." This refers to a situation in which funds that merge, close, or stop reporting have their results dropped from the index. Again, this biases returns upward, and risk downward.

The fourth problem is the "stale pricing bias." When the reported price of an infrequently traded security is determined not by a market transaction, but rather by an appraisal (often by the fund manager), a number of distortions typically result. First, the returns on the security (and of the fund itself) display a higher correlation over time than is the case with most publicly traded securities. Second, this causes reported standard deviations to appear artificially low. It also artificially depresses the reported correlation of return with other asset classes. (For more information on these biases, see "Do Hedge Funds Hedge?" by Asness, Krail, and Liew, and "Asset Allocation Effects of Adjusting Alternative Assets for Stale Pricing" by Andrew Connor).

The fifth problem is known as "style drift." Particularly in the case of hedge funds, researchers have found that a hedge fund's self-categorization of its investment strategy (e.g., Equity Market Neutral), when regressed against different asset class returns, shows that another approach is being used (e.g., equity long/short, which entails substantial systematic risk exposure).

A number of index providers have attempted to eliminate some, if not all of these biases. For example, the value weighted CSFB/Tremont Hedge Fund Indexes do not allow backfill data, and they are corrected for survivorship bias. Over the 1994-2004 period, the real returns on this index (and on two key sub-style indexes) are as follows:

ISSN 1554-5075

Annualized Quarterly Data	**All Hedge Funds**	**Equity Market Neutral**	**Global Macro**	**U.S. Public Market Equity**
Average Annual Real Return	11.8%	7.1%	16.1%	9.5%
Standard Deviation of Returns (Volatility)	9.4%	5.0%	13.3%	18.1%
Skewness of Returns (Asymmetry)	(.26)	(.18)	.18	(.26)
Kurtosis of Returns (Size of Tails)	.24	(.72)	.20	(.10)

We include Equity Market Neutral and Global Macro in this table because they are based on two clear strategies for generating alpha: security selection (in the case of EMN), and asset class timing (in the case of GM). Their correlation with each other is .43. As you can see, the two hedge fund styles, plus the overall index, have historically delivered attractive aggregate returns per unit of risk, as measure by standard deviation (volatility). You can also see that at this aggregate level, the distributions of hedge fund returns are close to normal. Skewness refers to whether the distribution is tilted to the left (negative skew, or annual returns below the average more likely) or right (positive skew). A skew greater than .5 or less than (.5) is considered a significant departure from normality. Kurtosis measures the extent to which more returns are located in the tails of the distribution (i.e., at either extreme) relative to a normal distribution. A positive kurtosis value implies a higher than normal percentage of extreme annual returns. Kurtosis of more than 1.0 or less than (1.0) is considered a significant departure from normality.

However, we stress that these figures are aggregates for a given hedge fund style. At the level of an individual hedge fund, annual returns can be (and often are) very non-normally distributed. What this table says is that when these funds are combined, their returns come close to a normal distribution with attractive risk and return characteristics.

ISSN 1554-5075

On the private equity side, many writers have tried to adjust for the aforementioned data problems, to produce a clear picture of the performance of buyout and venture capital funds. Kaplan and Schoar found that between 1980 and 2001, the adjusted return and risk on buyout funds (after manager fees) was essentially equal to that on the public equity market. Their index of venture funds returns delivered about 3.5% more than the public equity market, with about 14% more standard deviation. Susan Woodward of Sand Hill Econometrics has done a similar analysis, and published her findings in "Measuring Risk and Performance of Private Equity." She also finds that buyout returns are about as risky as the public equity market, and are also highly correlated with it. In contrast, venture capital was about twice as risky as the public equity market, but its returns were also highly correlated with it, just as theory would suggest. Regarding those returns, the Venture Economics database shows that, over the 20 years ending in December 2004, aggregate venture capital fund investments outperformed the S&P 500 by only 4.0% per year.

This raises an obvious question: Can you invest in a hedge fund or private equity index product?

Many hedge, buyout, and venture capital funds are organized as limited partnerships, with the investment manager as the general partner. These LP investments are generally only available to "qualified" investors", who can produce evidence of a minimum level of income or net worth. In addition, the minimum investment in a hedge or private equity partnership has traditionally been quite large. However, in recent years these have been falling. For example, some partnerships now accept minimum investments of $25,000. Even smaller minimums are often available if the investment advisors, who combine different people's contributions to reach the LP's minimum investment. In addition, in a few cases, private equity funds have been organized as either publicly traded closed end funds (e.g., Apollo Investments or Ares Capital in the United States), or individual companies (Onex in Canada, 3i in the U.K., or RHJ International on the Euronext in Brussels).

Similarly, a growing number of closed end and even open ended mutual funds (OEICs or unit trusts in Europe) now claim to be using "hedge fund-like" strategies to manage their investments (e.g., Hussman Strategic Growth Fund and the Pimco All Asset Fund in the United States, which are similar to equity market neutral and global macro hedge funds). Retail hedge funds are available in some countries. A good example of this is the Tremont

ISSN 1554-5075

Capital Opportunity Trust in Canada (TT.UN), which invests in a broad mix of underlying hedge fund strategies. However, these funds of funds are not cheap; the Tremont's expenses are on the order of 3.0% per year. This has created an opportunity for the introduction of lower cost products that track hedge fund indexes. One example of a hedge fund index product in the United States is the RYDEX Sphinx fund (which has a $25,000 minimum). Another example, Rydex' Structured Beta Funds, is discussed in this month's product and strategy notes. Elsewhere, in many countries CSFB offers similar products that track the CSFB/Tremont investable hedge fund indexes. And in Germany, Hansainvest has recently launched an index fund that tracks the MSCI HedgeInvest Index.

Finally, in some countries, equity linked debt instruments also have been issued which promise return of principle, plus payments that are tied to the return on a hedge fund interest. A good example of these is a note issued by Societe Generale Bank in Canada, and the Isle of Man, whose return is tied to the MSCI Hedge Invest Index. Rabobank has launched a similar product in Europe. To our knowledge, there are no investable products based on a buyout, venture capital, or combined private equity index.

However, the performance so far of investable hedge fund index products confirms the problem of fund returns declining with size that was first raised in the theoretical literature. Since these index products invest in relatively large underlying hedge funds, their performance has tended to lag that of the broad hedge fund index, which contains a large number of smaller funds. For example, the year to date nominal return through June, 2005 on the CSFB/Tremont Hedge Fund Index was 1.34% (in U.S. dollars), while the return on the MSCI HedgeInvest Index was .17%, while the return on the Standard and Poor's Hedge Fund Index (SPHINX) was .13%, and the CSFB Tremont Investable Hedge Fund Index was up .19%.

So where does this leave us? Should you invest in hedge funds, buyouts, and/or venture capital? When it comes to buyout funds, we think that the answer should be "No." Absent superior skill in forecasting future buyout manager performance, an investor on average is likely to only earn a risk adjusted rate of return comparable to public market equity. More importantly, given the large difference between the returns on top buyout funds versus all the others, an unskilled investor is likely to do worse than he or she would have with an equity index fund.

ISSN 1554-5075

Venture capital does not present an equally clear answer. Given the high correlation of venture capital returns with public equity markets, its logical role in a portfolio seems to be that of a return enhancer, rather than a risk reducer. This suggests that it would only be appropriate in portfolios with a high real rate of return target. Moreover, given the large spread between the annual returns earned by top quartile versus bottom quartile venture capital funds (Kaplan and Schoar estimate this gap at 20% over the 1980 – 2001 period), and absent an investable index product, potential venture capital investors face the problem of identifying a skilled fund manager. If you have no confidence you can do this, probability suggests you will be better off not investing in venture capital.

However, when it comes to investing in hedge funds, an investor's decision is made considerably harder by the growing number of index products that are available, not just on a broad index, but also on sub-styles like Equity Market Neutral and Global Macro. The argument in favor of investing in hedge funds index products runs like this. (1) I know I lack the skill to pick top quartile hedge fund managers. (2) However, I have the risk capacity to pursue higher returns than are available from my well-diversified, low-cost beta (asset class index fund) portfolio. (3) Managers of traditional "long-only" actively managed mutual funds are charging me relatively high prices for a mix of systematic (beta) and unsystematic (alpha) returns that are often times highly correlated with the returns on other parts of my portfolio. (4) By investing in an Equity Market Neutral hedge fund style index, I can obtain, at a relatively low cost, some (close to) pure alpha return that should have a low correlation with the rest of my portfolio. The same is true for a Global Macro hedge fund index product. (5) I accept the risk of a decline in forecasting skill (and therefore returns) as the hedge funds that underlie the index products in which I am investing grow in size, and the overall hedge fund market becomes more competitive.

In sum, for most of us, investing in hedge funds will never be a fast and easy path to riches. On the other hand, for those investors with sufficient risk capacity, investable hedge fund indexes provide a low cost alternative with a reasonable probability of adding some uncorrelated returns to their portfolios.

ISSN 1554-5075

Product and Strategy Notes

New Commodity Index Products

A new ETF tied to oil prices ("Oil Securities") started trading in London at the end of July. Not sure how much difference there is between this and the GSCI, which is already heavily weighted towards energy commodities. Still, the more commodity index products, the better. In the United States, Barclays Global Investors has registered a new ETF that will, like the Oppenheimer Real Assets Fund, track the Goldman Sachs Commodity Index. A similar product is already trading in the Eurozone. With an expense ratio of only .75%, the new GSCI ETF will be considerably cheaper than the Real Assets Fund (which also carries a hefty front end load).

More Competition for DFA

We have noted in the past how Dimensional Fund Advisers have differentiated their index offerings by offering index value tilts in asset classes where they are not elsewhere available. Slowly, this is beginning to change. A good example of this is the recent launch by Barclays Global Investors of new ETFs that track the value and growth sub-indexes of the MSCI Europe, Asia and Far East (EAFE) Index. Of course, this still leaves investors with the question of whether or not to take a value tilt. As we have noted in the past, there are two competing points of view on this issue. One says that the additional return value tilts have earned in the past have been compensation for risk factors that aren't captured by the standard deviation statistic. The other argument says, in essence, that two factors make a "free lunch" (higher than market returns, but with less risk) possible. First, some investors consistently make valuation mistakes (e.g., overestimating future growth rates, and overpaying for growth stocks which drives down the return on a growth index, and drives up the relative return on a value index). Second, there are durable barriers that prevent arbitrageurs from competing away the higher returns from a value tilt. Our conclusion is that while the latter argument may apply over short periods of time, over a 20-year holding period the efficient markets

ISSN 1554-5075

argument seems the stronger of the two. In other words, in financial markets, as in most other areas of life, there is no free lunch.

New Rydex Hedge-Type Mutual Funds

Rydex has recently registered a very interesting new offering, which attempts go give small investors a relatively low cost opportunity to gain exposure to hedge-fund type investment strategies. The premise of the new "Structured Beta Funds" is that you can replicate hedge fund strategies by copying their exposures to different asset classes and tilts within them. The funds' draft prospectus expands on this point: "As the result of market observations and internal and external research, Rydex Investments (the "Advisor") believes that aggregate hedge fund performance is largely driven by exposure to well recognized structural investment strategies or Beta. Beta is commonly referred to as market risk. "

"To better understand this concept, the Advisor offers an expanded definition: Beta is exposure to any systematic risk for which the investor expects to be rewarded over time. In this context it is easier to see how the Advisor considers exposure to both directional positions (e.g., equities and fixed income) and non-directional positions (e.g., value and corporate default) as Beta. Although hedge fund exposure to these positions varies over time, their exposure to them, in aggregate, and the investment returns provided by the exposure are surprisingly stable. The conclusion of the Advisor's research is that aggregate hedge fund returns are replicable through exposure to these structural investment positions and, therefore, the benefits of hedge fund investing can be delivered in a mutual fund. The Rydex Structured Beta Series Funds all employ a proprietary quantitative model that uses a style analysis of appropriate hedge fund index returns. This style analysis compares the returns of the appropriate hedge fund index returns with the returns of various directional and non-directional positions. Based on the results of this analysis, historical research and market insights, the Advisor constructs a portfolio mix of directional and non-directional positions that best replicates the return, risk and correlation characteristics of the appropriate hedge fund universe. The Advisor anticipates adding and subtracting directional and non-directional positions over time based on continuing research of hedge fund returns."

ISSN 1554-5075

Here is a concrete example of how this would work in practice. We regressed the 1994-2004 quarterly real returns on the CSFB/Tremont Hedge Fund Index against those on eight asset classes (Rydex uses more): investment grade nominal return U.S. dollar bonds, investment grade non-U.S. dollar bonds, high yield U.S. dollar bonds, U.S. commercial property, commodities, domestic U.S. equity, international (developed and emerging markets) equity, and U.S. equity volatility. Together, these variables had a .42 correlation with the return on the hedge fund index over this eleven year period. The specific factor exposures were as follows:

Domestic Investment Grade Bonds	.80 -- e.g., a long position
Foreign Investment Grade Bonds	.09
High Yield Bonds	(.28) – e.g., a short position
Commercial Property	(.19)
Commodities	.06
Domestic Equity	.06
International Equity	.10
Equity Volatility	(.02)

Other studies have shown that by adding other factors to this regression (e.g., the returns on long and short index option positions, the returns to small cap and momentum tilts, etc.), its explanatory power can be increased still further. In short, there seems to be much merit to the approach being taken by Rydex. Their structured beta funds will initially attempt to replicated the returns on an overall hedge fund index, an equity long/short strategy, and an equity market neutral strategy.

The True Cost of Active Management

We have long noted that, because of their net-long positions, actively managed mutual funds are effectively in the business of charging active fees (e.g., expenses as a percent of fund value) for what are, in large part, passive returns (i.e., the percentage of fund returns that are due to movements in the overall market, which could have been obtained via a low-cost index fund). This is the underlying problem that has given rise to the movement among institutional

ISSN 1554-5075

and sophisticated individual investors to "separate alpha from beta", for example, by investing in a mix of asset class index funds, along with equity market neutral and global macro hedge funds.

A great new research paper has finally quantified the cost to investors that comes from mistaking beta for alpha. In "Measuring the True Cost of Active Management by Mutual Funds", Ross Miller finds that over 90% of the variance in the average active fund's returns can be explained by market movements, not active management decisions. He then relates the active management expenses they charge to the active returns (alpha) they actually deliver. He estimates that (conservatively) actively managed funds in the Morningstar universe have an average active expense ratio of 5%. Ouch!

Latest Standard and Poor's Index Versus Active Report

S&P has published its latest SPIVA Report. The following table shows the percent of actvely managed mutual funds that underperformed the relevant index over the last five years.

	Value	**Blend**	**Growth**
Large Cap	55.5%	64.4%	62.5%
Mid Cap	91.4%	79.2%	87.7%
Small Cap	60.1%	79.2%	91.3%

Given the aforementioned finding that the average active expense ratio is actually 5% per year, doesn't their stunning long-term underperformance versus index funds make you feel good?

New Bridgewater "All Weather" Fund Launched in Australia

Bridgewater Associates and Bell Potter funds have recently launched a retail version of their institutional "All Weather Fund" in Australia. The fund's goal is to deliver a return similar to domestic equities, with a risk similar to domestic bonds. Its strategy for achieving this goal is to invest in a mix of asset class index funds, using some leverage in addition to investors'

ISSN 1554-5075

funds. Based on the average annual real return on Australian equities between 1989 and 2004, the fund's target average arithmetic real return should be about 8% per year.

ISSN 1554-5075

Model Portfolios Update

We produce three different types of model portfolios. Each of these is based on a different portfolio construction methodology.

We use a "rule of thumb" approach (or, to use the more formal term, a "heuristic approach") to construct our benchmark portfolios. More specifically, we use three "rules of thumb" that are often cited in news stories a mix of 80% equities and 20% debt (for our high risk/high return portfolios); a mix of 60% equities and 40% debt (for our moderate risk/moderate return portfolios); and a mix of 20% equities and 80% debt (for our low risk/low return portfolios). Using different terminology, somebody else might call these three portfolios aggressive, balanced, and conservative. We implement these three rules of thumb in two different ways (to construct six different benchmark portfolios). The first uses just two asset classes: domestic investment grade bonds and domestic equity. The second uses a broader mix of asset classes: domestic and foreign investment grade bonds, and domestic and foreign (including emerging market) equity. In addition to these 80/20, 60/40, and 20/80 portfolios, we also provide our "couch potato" portfolio. This portfolio is equally allocated to all of the asset classes we use. More formally, this is known as the "1/N heuristic," which research has shown is an approach used by a significant proportion of retirement plan investors. This 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 the "couch potato" portfolio as one of our benchmarks. Finally, each year we also benchmark all our portfolios against the return from holding 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 A$ cash benchmark return is 5.06% (nominal).

ISSN 1554-5075

The goal of our second set of model portfolios is to either deliver more return than the domestic benchmark portfolios, while taking on no more risk, or to deliver the same level of return while taking on less risk. To develop these model portfolios, we use a methodology known as "mean/variance optimization" or MVO. This approach uses three variables for each asset class (its expected return, standard deviation of returns, and correlation of returns with other asset classes) to construct different combinations of portfolios which maximize return per unit of risk (another way of looking at this is that they minimize risk per unit of return). The MVO technique has some significant limitations. While it is a good approach to single year portfolio optimization problems, in multiyear settings it fails to adequately take into account the fact that poor portfolio performance in early years can substantially reduce the probability of achieving long term goals. It also fails to adequately account for most people's intuitive understanding of risk: what's important isn't standard deviation (the dispersion of annual returns around their mean), but rather the chance that I will fall short of my long-term goals. Given these limitations, our MVO portfolios are most appropriate for managers whose performance is evaluated on an annual basis in comparison to one of our benchmarks.

Our third set of model portfolios uses a simulation optimization methodology. It assumes that an investor understands the long-term compound real rate of return he or she needs to earn on his or her portfolio to achieve his or her long-term financial goals. We use SO to develop a multi-period asset allocation solutions that are “robust”. They are intended to maximize the probability of achieving an investor’s compound annual return target under a wide range of possible future asset class return scenarios. More information about the SO methodology is available on our website. Using this approach, we produce model portfolios for three different compound annual real return targets: 7%, 5%, and 3%. We produce two sets of these portfolios: one includes hedge funds as a possible asset class, and one does not.

The year-to-date results for all these model portfolios are shown in the tables on the following pages.

ISSN 1554-5075

Model Portfolios Year-to-Date Performance

These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)			
	YTD 29Jul05	**Weight**	Weighted Return
	In A$		In A$
High Risk Portfolio			
Asset Classes			
Australia Benchmark			
Australian Equity	10.9%	**80%**	**8.7%**
Australian Bonds	1.8%	**20%**	**0.4%**
		100%	**9.1%**
Global Benchmark			
U.S. Equity	6.8%	**40%**	**2.7%**
Non-U.S. Equity	5.9%	**40%**	**2.4%**
U.S. Bonds	4.5%	**10%**	**0.5%**
Non-U.S. Bonds	4.7%	**10%**	**0.5%**
		100%	**6.0%**
Recommended			
Australian Equity	10.9%	**30%**	**3.3%**
Foreign Equity (US)	6.8%	**23%**	**1.6%**
Foreign Equity (EAFE)	4.6%	**18%**	**0.8%**
Australian Bonds	1.8%	**19%**	**0.3%**
Commodities	13.1%	**10%**	**1.3%**
		100%	**7.3%**

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These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)			
	YTD 29Jul05	**Weight**	Weighted Return
	In A$		In A$
Medium Risk Portfolio			
Asset Classes			
Australia Benchmark			
Australian Equity	10.9%	**60%**	**6.5%**
Australian Bonds	1.8%	**40%**	**0.7%**
		100%	**7.3%**
Global Benchmark			
U.S. Equity	6.8%	**30%**	**2.1%**
Non-U.S. Equity	5.9%	**30%**	**1.8%**
U.S. Bonds	4.5%	**20%**	**0.9%**
Non-U.S. Bonds	4.7%	**20%**	**0.9%**
		100%	**5.7%**
Recommended			
Australian Equity	10.9%	**25%**	**2.7%**
Foreign Equity (US)	6.8%	**14%**	**1.0%**
Australian Bonds	1.8%	**40%**	**0.7%**
Commodities	13.1%	**10%**	**1.3%**
Foreign Equity (EAFE)	4.6%	**11%**	**0.5%**
		100%	**6.2%**

ISSN 1554-5075

These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)			
	YTD 29Jul05	**Weight**	**Weighted Return**
	In A$		In A$
Low Risk Portfolio			
With suggested US Index Funds			
Australia Benchmark			
Australian Equity	10.9%	**20%**	**2.2%**
Australian Bonds	1.8%	**80%**	**1.5%**
		100%	**3.6%**
Global Benchmark			
Foreign Equity (US)	6.8%	**10%**	**0.7%**
Non-U.S. Equity	5.9%	**10%**	**0.6%**
U.S. Bonds	4.5%	**40%**	**1.8%**
Non-U.S. Bonds	4.7%	**40%**	**1.9%**
		100%	**5.0%**
Recommended			
Australian Equity	10.9%	**10%**	**1.1%**
Foreign Equity (US)	6.8%	**8%**	**0.5%**
Australian Bonds	1.8%	**60%**	**1.1%**
Global Bonds	0.6%	**8%**	**0.1%**
Foreign Equity (EAFE)	4.6%	**7%**	**0.3%**
Commodities	13.1%	**7%**	**0.9%**
		100%	**4.0%**
Global Bond Index = 50% US$ plus 50% Non-US$ Bonds			

ISSN 1554-5075

These portfolios seek to minimize risk while matching their benchmark's returns.			
	YTD 29Jul05	**Weight**	**Weighted Return**
	In A$		In A$
High Return Portfolio			
Asset Classes			
Australia Benchmark			
Australian Equity	10.9%	**80%**	**8.7%**
Australian Bonds	1.8%	**20%**	**0.4%**
		100%	**9.1%**
Global Benchmark			
U.S. Equity	6.8%	**40%**	**2.7%**
Non-U.S. Equity	5.9%	**40%**	**2.4%**
U.S. Bonds	4.5%	**10%**	**0.5%**
Non-U.S. Bonds	4.7%	**10%**	**0.5%**
		100%	**6.0%**
Recommended			
Australian Equity	10.9%	**11%**	**1.2%**
Foreign Equity (US)	6.8%	**19%**	**1.3%**
Australian Bonds	1.8%	**45%**	**0.8%**
Foreign Equity (EAFE)	4.6%	**15%**	**0.7%**
Commodities	13.1%	**10%**	**1.3%**
		100%	**5.3%**

ISSN 1554-5075

These portfolios seek to minimize risk while matching their benchmark's returns.			
	YTD 29Jul05	**Weight**	**Weighted Return**
	In A$		In A$
Medium Return Portfolio			
Asset Classes			
Australia Benchmark			
Australian Equity	10.9%	60.0%	6.5%
Australian Bonds	1.8%	40.0%	0.7%
		100%	7.3%
Global Benchmark			
U.S. Equity	6.8%	30%	2.1%
Non-U.S. Equity	5.9%	30%	1.8%
U.S. Bonds	4.5%	20%	0.9%
Non-U.S. Bonds	4.7%	20%	0.9%
		100%	5.7%
Recommended			
Australian Equity	10.9%	10%	1.1%
Foreign Equity (US)	6.8%	7%	0.5%
Foreign Equity (EAFE)	4.6%	5%	0.2%
Australian Bonds	1.8%	60%	1.1%
Global Bonds	0.6%	13%	0.1%
Commodities	13.1%	5%	0.7%
		100%	**3.6%**

ISSN 1554-5075

These portfolios seek to minimize risk while matching their benchmark's returns.			
	YTD 29Jul05	**Weight**	**Weighted Return**
	In A$		In A$
Low Return Portfolio			
Asset Classes			
Australia Benchmark			
Australian Equity	10.9%	20.0%	2.2%
Australian Bonds	1.8%	80.0%	1.5%
		100%	3.6%
Global Benchmark			
U.S. Equity	6.8%	10.0%	0.7%
Non-U.S. Equity	5.9%	10.0%	0.6%
U.S. Bonds	4.5%	40.0%	1.8%
Non-U.S. Bonds	4.7%	40.0%	1.9%
		100%	5.0%
Recommended			
Australian Equity	10.9%	12.0%	1.3%
Emerging Mkt Equity	15.4%	3.0%	0.5%
Australian Bonds	1.8%	60.0%	1.1%
Global Bonds	0.6%	25.0%	0.2%
		100%	**3.0%**
Global Bond Index = 50% US$ plus 50% Non-US$ Bonds			

ISSN 1554-5075

These portfolios seek to maximize the probability of achieving at least the target real return over twenty years, at the lowest possible risk.			
	YTD 29Jul05	**Weight**	**Weighted Return**
	In A$		In A$
7% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Australian Real Return Bonds	4.6%	0%	**0.0%**
Australian Bonds	1.8%	3%	**0.1%**
Global Bonds	0.6%	7%	**0.0%**
Commercial Property	1.4%	3%	**0.0%**
Commodities	13.1%	17%	**2.2%**
Australian Equity	10.9%	25%	**2.7%**
Foreign Equity (USA)	6.8%	21%	**1.4%**
Foreign Equity (EAFE)	4.6%	16%	**0.7%**
Emerging Equity	15.4%	8%	**1.2%**
Hedge Funds	4.2%	0%	**0.0%**
		100%	**8.5%**
	YTD 29Jul05	**Weight**	**Weighted Return**
	In A$		In A$
5% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Australian Real Return Bonds	4.6%	17%	**0.8%**
Australian Bonds	1.8%	5%	**0.1%**
Global Bonds	0.6%	2%	**0.0%**
Commercial Property	1.4%	3%	**0.0%**
Commodities	13.1%	20%	**2.6%**
Australian Equity	10.9%	18%	**2.0%**
Foreign Equity (USA)	6.8%	17%	**1.2%**
Foreign Equity (EAFE)	4.6%	13%	**0.6%**
Emerging Equity	15.4%	5%	**0.8%**
Hedge Funds	4.2%	0%	**0.0%**
		100%	**8.1%**

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	YTD 29Jul05	Weight	Weighted Return
	In A$		In A$
3% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Australian Real Return Bonds	4.6%	56%	**2.6%**
Australian Bonds	1.8%	10%	**0.2%**
Global Bonds	0.6%	7%	**0.0%**
Commercial Property	1.4%	0%	**0.0%**
Commodities	13.1%	12%	**1.6%**
Australian Equity	10.9%	5%	**0.5%**
Foreign Equity (USA)	6.8%	6%	**0.4%**
Foreign Equity (EAFE)	4.6%	4%	**0.2%**
Emerging Equity	15.4%	0%	**0.0%**
Hedge Funds	4.2%	0%	**0.0%**
		100%	**5.5%**

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ISSN 1554-5075

These portfolios seek to maximize the probability of achieving at least the target real return over twenty years, at the lowest possible risk.		***Unlike the other target real return portfolios, these allow investment in a hedge fund index.***	
	YTD 29Jul05	**Weight**	**Weighted Return**
	In A$		In A$
7% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Australian Real Return Bonds	4.6%	0%	**0.0%**
Australian Bonds	1.8%	2%	**0.0%**
Global Bonds	0.6%	7%	**0.0%**
Commercial Property	1.4%	15%	**0.2%**
Commodities	13.1%	8%	**1.1%**
Australian Equity	10.9%	21%	**2.3%**
Foreign Equity (USA)	6.8%	15%	**1.0%**
Foreign Equity (EAFE)	4.6%	12%	**0.6%**
Emerging Equity	15.4%	15%	**2.3%**
Hedge Funds	4.2%	5%	**0.2%**
		100%	**7.7%**
	YTD 29Jul05	**Weight**	**Weighted Return**
	In A$		In A$
5% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Australian Real Return Bonds	4.6%	0%	**0.0%**
Australian Bonds	1.8%	8%	**0.1%**
Global Bonds	0.6%	10%	**0.1%**
Commercial Property	1.4%	12%	**0.2%**
Commodities	13.1%	12%	**1.6%**
Australian Equity	10.9%	25%	**2.7%**
Foreign Equity (USA)	6.8%	13%	**0.9%**
Foreign Equity (EAFE)	4.6%	10%	**0.5%**
Emerging Equity	15.4%	8%	**1.2%**
Hedge Funds	4.2%	2%	**0.1%**
		100%	**7.3%**

ISSN 1554-5075

	YTD 29Jul05	Weight	Weighted Return
	In A$		In A$
3% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Australian Real Return Bonds	4.6%	65%	**3.0%**
Australian Bonds	1.8%	5%	**0.1%**
Global Bonds	0.6%	3%	**0.0%**
Commercial Property	1.4%	4%	**0.1%**
Commodities	13.1%	5%	**0.7%**
Australian Equity	10.9%	3%	**0.3%**
Foreign Equity (USA)	6.8%	7%	**0.5%**
Foreign Equity (EAFE)	4.6%	6%	**0.3%**
Emerging Equity	15.4%	0%	**0.0%**
Hedge Funds	4.2%	2%	**0.1%**
		100%	**5.0%**

	YTD 29Jul05	Weight	Weighted Return
	In A$		In A$
Equally Weighted Portfolio	*YTD Returns are Nominal*		
Asset Classes			
Australian Real Return Bonds	4.6%	12.5%	**0.6%**
Australian Bonds	1.8%	12.5%	**0.2%**
Global Bonds	0.6%	12.5%	**0.1%**
Commercial Property	1.4%	12.5%	**0.2%**
Commodities	13.1%	12.5%	**1.6%**
Australian Equity	10.9%	12.5%	**1.4%**
Foreign Equity (USA)	6.8%	7.3%	**0.5%**
Foreign Equity (EAFE)	4.6%	5.2%	**0.2%**
Emerging Equity	15.4%	12.5%	**1.9%**
Total		100.0%	**6.7%**

ISSN 1554-5075