

AIS Report

Fireflies before the storm

■ Are hedge funds ahead of the game?

The focus on absolute returns with respect to risk management might turn out to be more than just a bear market fad. What we today call 'hedge funds' might turn out to be the fireflies before the storm that is about to sweep over the asset management industry. The storm that we predict is the real disturbance to the system.

■ When the long term and the short term merge

We believe the disturbance to the system is the active asset management industry adopting an absolute return approach. This could be viewed as a merger between the traditional asset allocation process with techniques and approaches from the risk management industry.

■ Risk is manageable, returns are not

While investing for the 'long-term' is laudable, interim volatility matters too. We contrast the status quo with an approach based on absolute returns, with particular emphasis on risk management. The bone of contention is the lack of a universal definition of risk.

■ Risk management is like musical chairs

If you are slow, you are less likely to win the game. We suspect that a contrarian, dynamic, flexible and market-oriented approach to managing risk is superior to a trend-following, administrative, static and dogmatic approach.

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Overview and structure

‘Science is perhaps the only human activity in which errors are systematically criticised and, ... in time corrected’

Karl Popper

Introduction

This is the inaugural issue of AIS Report. We intend to publish this note on AIS (Alternative Investment Strategies) whenever we believe we have something interesting or thoughtful to say (as opposed to publishing on a regular basis). In this issue we re-visit risk, transparency, fees, and return expectations. Whether these subjects are interesting and our analysis thoughtful is, obviously and as always, in the eyes of the beholder.

In this issue of the AIS Report we hypothesise on whether the recent increase in acceptance and flows into hedge funds is more than just a bear market fad. Our conclusions are affirmative. By discussing evergreen issues such as transparency (or the lack thereof), risk, fees, and return expectations, we conclude that potentially, hedge funds are like fireflies before the storm, where the storm is the real disturbance to the system.

Our hypothesis is that the asset management industry is in the process of moving from the second paradigm to the third. We defined the three paradigms as follows:

- (1) Absolute return approach with low degree of manager specialisation
- (2) Relative return approach with high degree of manager specialisation
- (3) Absolute return approach with high degree of manager specialisation

The choice of words with respect to ‘paradigm’ or ‘paradigm shift’ are probably not ideal. However, we make the point that there was an asset management industry before there were benchmarks. This first paradigm was characterised by an absolute return focus and a low degree of specialisation on the part of the manager. This first paradigm was replaced by the second paradigm, the relative return game. In this second paradigm (essentially the status quo), managers have a relative return focus and a higher degree of specialisation. What we refer to as the third paradigm is a combination of the absolute return approach from the first paradigm, and the high degree of specialisation of the second paradigm. Combining an absolute return approach with a high degree of manager specialisation results in the manager having a mandate to balance investment opportunity with capital at risk. Today we call this a hedge fund. However, the term, essentially a misnomer, might disappear.

Structure

On page 5 we discuss issues surrounding transparency and risk (again). We state the opinion that risk is far more complex than to be captured by a single aggregate risk figure or a daily risk report. We introduce a somewhat esoteric definition of risk, where we define risk as ‘exposure to change’. We believe that, with respect to transparency, there is some confusion between risk measurement and risk management and that the latter is scarce and difficult, whereas the former is not. This leads to a discussion on fees.

On page 22 we contrast absolute fees with the absolute returns that were promised but, unfortunately, did not materialise. We repeat our point of view, that the absolute level of fees to the end investor should be somewhat correlated to alpha, that is, investment skill. We believe, investors should pay an active fee for active money management and a passive and lower fee for passive management. If our assessment has merit, then risk management, where risk is defined in absolute terms, could be viewed as a source of alpha, as risk management is judgmental (hence active) and difficult (hence scarce).

On page 53 we pick up on the issue of return expectations. Since our December 1999 report (*20th Century Volatility*) only covered the medium term (700 years of UK consumer price inflation) and short term (300 years of equity returns), we expanded our observation period to also include the long term, that is, to encompass the full 5,000 years of human civilisation. In this section we revisit our earlier claim that risk is exposure to change and make the point that this definition might not be as esoteric as initially implied. We hypothesise that, potentially, change and uncertainty are the only constants and that risk management is the discipline to deal with change and uncertainty. If this claim has merit and some of our notions are true, then the ramifications for the whole asset management industry are material.

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Transparency and risk

‘Anyone who likes legislation or sausage should watch neither one being made.’

Otto von Bismarck

Risk is exposure to change

The issue of transparency is still on the agenda. To us, the consensus seems to be moving from real-time and single-position transparency demanded 12-18 months ago, to more aggregated risk measures. The focus on aggregate risk measures, however, has its own set of problems (we will discuss full transparency through indexation in a future issue of the AIS Report.)

One of the major issues with respect to aggregate risk measures and transparency, in our opinion, is that the investor is in search of an objective measure of risk. However, there is no all-inclusive definition of risk. Different investors have different definitions of risk. As a result, potentially there is no such thing as an ‘objective measure of risk’. One way of demonstrating this notion is, we believe, by distinguishing between risk measurement and risk management. Although the two are not entirely unrelated, the underlying skill set is different. We believe that risk measurement can be narrowly defined and is probably to a large extent objective, whereas risk management is a much broader task and is subjective by definition.

A suitable analogy is the difference between accounting and entrepreneurship. Accounting is objective (at least in the axiomatic, fraud-free laboratory environment of the actuary). However, sound accounting does not automatically result in entrepreneurial success.¹ The latter is much more complex and difficult. It requires experience, creativity, intelligence, passion, drive, etc. Most importantly, founding and running a business successfully is subjective. There is a consensus as well as objective guidelines to do accounting. However, there is more than one approach that leads to entrepreneurial success (most of which, potentially, are not taught at business school).² To complete this analogy: risk measurement is similar to accounting where an inflexible approach (rules and guidelines) has merit, as the task requires objectivity and transparency. Risk management on the other hand requires a more flexible approach, is entrepreneurial in nature, and subjective by definition.

Consensus has probably given up on the issue of full position level transparency

Risk measurement is not synonymous with risk management

There is more than one road to Rome

¹ It is somewhat like being short a put option: good accounting does not guarantee success, but bad accounting nearly certainly results in disaster. Accounting and risk measurement, therefore, are important too.

² By ‘more than one approach’ we do not mean one legal and one illegal approach.

In our opinion, risk management is at least as much a craft as it is a science. A craftsman needs, we believe, a combination of skills, that is, a balance between outright knowledge and street smartness (tricks of the trade) to execute his job successfully. One could argue that this combination of skills goes far beyond, for example, econometric modelling of (historical) risk factors, or the abstract theorising under laboratory conditions. As we will elaborate throughout this document, risk is about what you don't know, not about what you know.

'I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge. Knowledge is limited.'
Albert Einstein

Difference between risk and uncertainty

For example, Knight [1921] distinguishes between 'risk' and 'uncertainty'. Risk describes situations where an explicit probability distribution of outcomes can be calculated, perhaps on the basis of actuarial data. In contrast, uncertainty describes situations where probabilities are unknown, and more importantly, where they are impossible to calculate with any confidence due to the uniqueness or specificity of the situation. Ellsberg [1961] demonstrated that most people prefer betting on a lottery where the probabilities are known to betting on lotteries with unknown probabilities, that is, displaying an aversion against 'Knightian uncertainty'. Knight argued that profits should be defined as the reward for bearing uncertainty. Note that Knightian uncertainty is incompatible with the traditional expected utility framework of Von Neumann and Morgenstern [1947] and Savage [1954]. The expected utility theory is based on the notion that outcomes are unknown, but their probabilities are known. Knight (as well as Keynes [1921]) argues that not only are the outcomes uncertain, the probabilities are unknown too.

'I would rather be vaguely right, than precisely wrong.'
John Maynard Keynes

We believe that a lot that has been written in the field of risk management in general and hedge funds in particular is focused on risk measurement. The typical method (factor and style analysis) is to model historical time series and come up with some risk factors that explain some of the historical variation in returns. While this is very interesting, it only covers a small part of the complexities of risk management. Why?

One of the (many) definitions of risk is:¹

Risk = exposure to change

This definition is very simple and somewhat unscientific but, we believe, very powerful. Risk measurement deals with the objective part. The risk measurer either calculates bygone risk factors, simulates scenarios or stress tests portfolios based on knowledge available today according to an objective (and statistically robust) set of rules. Any assessment of risk is based on knowledge that is available today. Risk, however, has to do with what we do not know today.² More precisely, risk is exposure to unexpected change that could result in

There are those who don't know – and those who don't know they don't know

¹ There is more than one definition of risk. Rahl [2003] for example defines risk as 'the chance of an unwanted outcome'. This definition also implies that the two sides of a return distribution (or, more importantly, the investors' utility thereof) are somewhat different and that the risk management process should be structured accordingly. Warren Buffett on risk: 'Risk comes from not knowing what you're doing.' Dan Quayle on the same topic: "If we don't succeed, we run the risk of failure."

² John Kenneth Galbraith comes to mind: 'We have two classes of forecasters: Those who don't know – and those who don't know they don't know.' This is probably also true of risk measurers, if they believe their model output is an unbiased reflection of the real world.

deviation of one's goals (such as meeting future liabilities, for example). By definition, we cannot measure what we do not know. We are free to assume any probability distribution, but that does not imply an objective assessment of risk. In other words, risk management is complex, primarily qualitative and interpretative in nature. Risk measurement, on the other hand, is more quantitative and rule-based, and has a rear mirror view by definition. As Mr. Bernstein put it in the last chapter of *Against the Gods*:¹

'Nothing is more soothing or more persuasive than the computer screen, with its imposing arrays of numbers, glowing colors, and elegantly structured graphs. As we stare at the passing show, we become so absorbed that we tend to forget that the computer only answers questions; it does not ask them. Whenever we ignore that truth, the computer supports us in our conceptual errors. Those who live only by the numbers may find that the computer has simply replaced the oracles to whom people resorted in ancient times for guidance in risk management and decision-making'.²

Risk measurement versus risk management

The fate of Long-Term Capital Management (LTCM) is often quoted as an example of the dangers of the reliance of any risk model output in dealing with uncertainty. Note, however, that LTCM probably employed both – the best scientists (academics) in the field of risk measurement, as well as the best craftsmen (traders) on Wall Street. Late Leon Levy [2002], co-founder the Oppenheimer Funds and Odyssey Partners, puts the limitation of pure science more boldly while discussing the failure of LTCM:

'What can be made of this chain of events [failure of LTCM]? First and foremost, never have more than one Nobel laureate economist as a partner in a hedge fund. LTCM had two. Having had one Nobel prize winner as a limited partner over the years, I can say that had our firm followed his advice, we too might have lost a lot of money'.

Note that this quote is taken slightly out of context. There is more praise for LTCM in the *The Mind of Wall Street – A Legendary Financier on the Perils of Greed and the Mysteries of the Market* (New York: Public Affairs) than there is criticism. Mr Levy for example argues that the 'willingness to take personal risk stands in refreshing contrast to all too many Wall Street players.' As many before him, Mr. Levy isolates hubris as the main catalyst for LTCM's failure (and not the failure to measure 'risk'). In other words, our interpretation of the lesson for investors is the following: A successful risk measurer comes up with an 'objective' correlation matrix or any other metric for 'risk'. A successful risk manager, however, knows that this metric, at best, is a biased view on future relationships, and at worst, a tool upon which slavish reliance can result in disaster.

LTCM as an example of risk being 'exposure to change'

Putting money where your mouth is

¹ Note that this quote is taken slightly out of context. *Against the Gods* asserts that successful risk management requires both, rigorous analysis (objective) and thought (subjective).

² From Bernstein [1996], p. 336

The insurance and pension fund industry, for example, are currently in the process of experiencing risk according to the aforementioned definition, as market environment and return expectations have changed. As the decade progresses, it is becoming increasingly apparent that some of the beliefs and assumptions, which were formed during the 20-year bull market are, potentially, false. Risk management (as opposed to risk measurement) deals with changing one's portfolio according to an ever-changing environment or changing rules that happened to have worked fine in the past. The future is uncertain. The only thing we really know for sure is that the status quo is going to change. Risk management, we believe, is the thought process that balances the investment opportunities with the probability of capital depreciation, or the risk of not meeting the set objectives. This means that it is, as mentioned, subjective by definition. It also means that someone with investment experience will most likely have a competitive advantage over some one who has none. To some extent, investing and managing risk is like musical chairs – if you're slow, chances are you are not going to win.

Managing risk is like musical chairs

Example

In risk measurement as well as in risk management, co-dependence is of crucial importance. Arguably, one of the greatest achievements of modern portfolio theory is that the combination of risky assets with positive expected returns and different volatility levels can reduce portfolio risk if the correlation between them is less than one. As a result, analysts and risk measurers calculate correlation factors. The correct (and objective) way to do this is by calculating the co-variance between log-returns of time series. The returns are either daily, weekly or monthly, and the period of observation varies depending on data availability and personal preference (which goes to show that there is even subjectivity in risk measurement). However, measuring correlation matrixes is a different task than managing risk, irrespective of the degree of sophistication of the model or model input. Risk measurement is just one tool for the risk manager (albeit an important one).

Co-dependence is important

In this example, the result of the analysis is a correlation matrix. The correlation matrix calculated using historical data is assumed to hold true for the future. However, given that we defined risk as exposure to change, true risk is manifested only, when the real world deviates from the assumed (or modelled) world, or precisely when the correlation matrix proves worthless. This observation is neither new nor is it undocumented. See for example Bookstaber [1997].

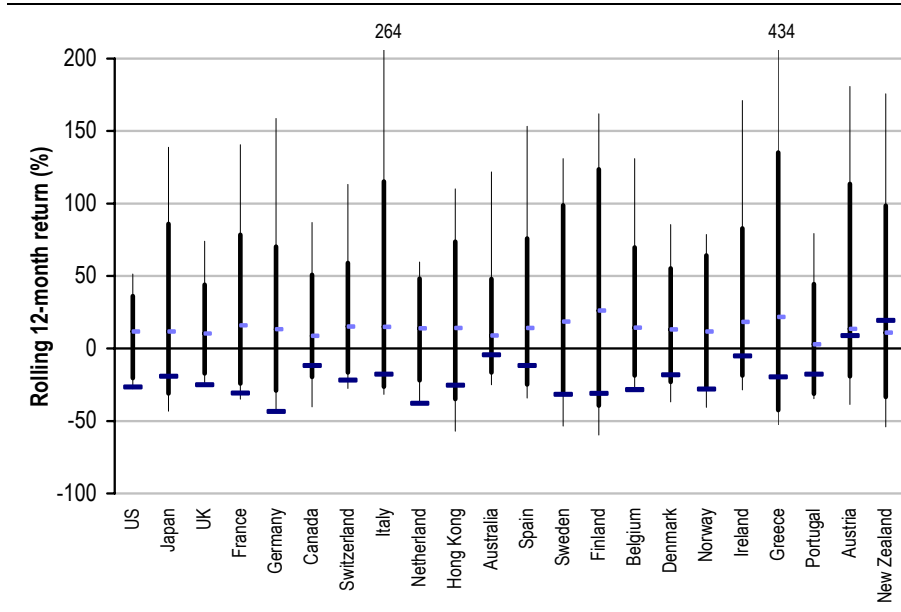
Any correlation matrix is hindsight-biased

Recent stock market history is a good example. Econometric models have not come close to picking up the current level of high correlation in equity markets. Gustave Le Bon [1896] popularised the phrase of contagion in 1896. Le Bon observed that in a group, individuals who may be very different from one another in every respect are transformed into a unified body with a collective mind that causes its members to behave very differently than they would if each person were acting in isolation. The sentiment of the crowd as well as its acts, Le Bon argued, is highly contagious. History shows that correlation increases in market downturns: the greater the fall, the higher the correlation. The following graphs should illustrate this point.

Correlation increases when markets fall

Chart 1 shows rolling 12-month returns for some equity markets among a sample of so-called developed economies, sorted by market capitalisation as of 31 March 2003 in US dollars. The thin vertical line measures the trading range of 12-month returns over a 20-year period, whereas the bold vertical line shows the 90%-range. The long horizontal tick measures the 12-month simple return (ie, excluding reinvested dividends) as of 31 March 2003. The small tick measures the mean.

Chart 1: Rolling 12-month returns in developed equity markets, 1983-2003

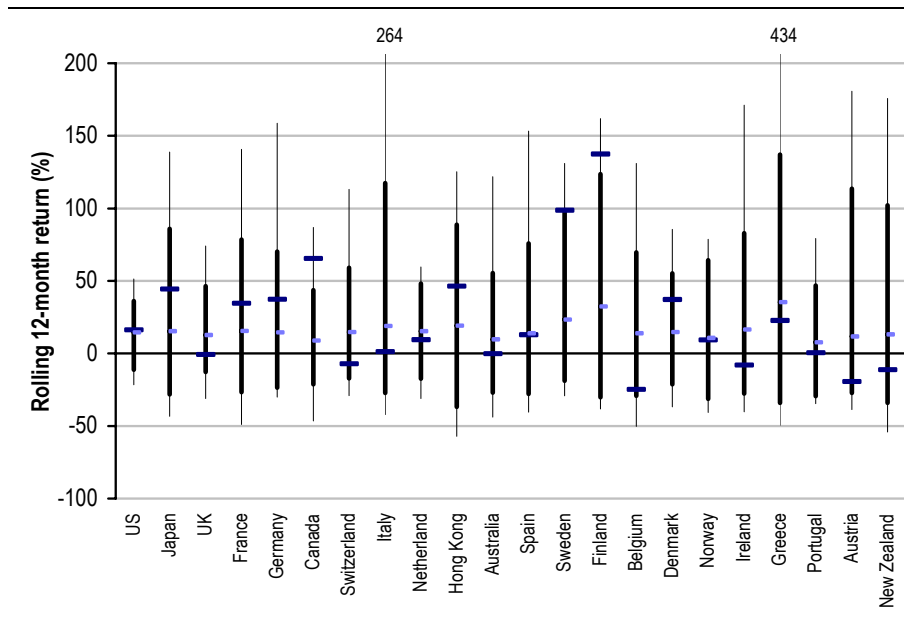


Source: UBS Warburg (based on data from Datastream)
 Vertical line measures 20-year trading range of 12-month returns. All returns are simple returns in US\$. All indices are broad MSCI indices except for Ireland (Datastream total market index) and Greece (Athens SE General).
 Observation period is 20 years except Greece (since 1989) and Portugal (since 1988).

- The main illustration of the graph is volatility, that is, the dispersion of returns around a mean (in this case the 12-month mean return).
- With respect to correlation, the graph shows that major markets are currently all under water by a significant amount. The exceptions are Austria and New Zealand, which traditionally have had minuscule allocations in most institutional portfolios.
- From the 22 countries shown, three (UK, Germany, and the Netherlands) were at their 20-year low at the end of March 2003. The 12-month return of six additional countries was in the 5% tail on the left hand side of the return distribution (US, France, Switzerland, Sweden, Belgium, and Norway).

Chart 2 shows how Chart 1 looked in March 2000 (showing rolling 12-month returns for the period from April 1980 to March 2000).

Chart 2: Rolling 12-month returns in developed equity markets, 1980-2000



Source: UBS Warburg (based on data from Datastream)

- The horizontal ticks in Chart 2 are scattered more or less all over the place.¹ Any econometric estimation of correlation most likely would have underestimated correlation, that is, overestimated diversification benefits.

¹ Investors who believe in mean reversion, should probably buy Switzerland. Next to Belgium and Ireland, Switzerland was the only country to have a negative 12-month return as of March 2000 and March 2003. It is unlikely that the long-term economic prospects of a sailing nation are so dim.

Tracking risk versus total risk

There are many differences between the relative return approach and the absolute return approach. No wonder then, that Fung and Hsieh [1997] and many other researchers found that hedge fund returns and risk characteristics were substantially different from those of mutual funds and standard asset classes. Mutual funds, relative return managers by design, are essentially long the asset class, whereas hedge funds can, putting it simply, more or less invest in anything in whatever proportion they choose, long or short. Some hedge funds have very strict predefined and disciplined investment processes, whereas others have full flexibility.

One obvious difference is that the relative return manager has a return objective that is defined relative to a market benchmark (note here that the introduction of a benchmark was not the idea of the relative return manager, but his investor.) The aim is to exceed the return of a market benchmark (by more than is explained through taking more risk, that is, the overall goal is to have a positive information ratio). The absolute return manager will have a different return objective. Proprietary trading desks at investment banks, for example, want to make money with a finite (but flexible) amount of the banks' balance sheet capital. Hedge funds and the fund of hedge funds managers (absolute return managers by design) might or might not have a fixed absolute return target. Funds of hedge funds, for example, often define their return target in reference to the risk-free rate. For example, the risk-free rate plus 500 basis points or 2.5 times the risk-free rate.

With absolute returns managers, therefore, the return objective is either absolute or relative to the risk-free rate. However, the main difference between the investment process of an absolute return manager (for example a hedge fund) and a relative return manager (for example a manager with an asset class benchmark and an implicit or explicit tracking error constraint) is differing definitions of risk (Table 1.) Whether hedge funds have a fixed or floating absolute return target is, potentially, a minor detail. They certainly all define risk in absolute terms. 'Absolute return manager' could just be a further misnomer (as is the term 'hedge fund'). The term 'absolute risk manager' would be more descriptive.

Market-based investment strategies are materially different from skill-based strategies

Capital preservation as part of the mandate

The main difference between the relative and absolute return approach is their differing definitions for risk

Table 1: Tracking risk versus total risk

	Relative-return model (market-based)	Absolute-return model (skill-based)
Return objective	Relative to benchmark	Absolute, positive return
<i>This means:</i>	<i>Capture asset class premium</i>	<i>Exploit investment opportunity</i>
Risk management	Tracking risk	Total risk
<i>This means:</i>	<i>Capture asset class premium</i>	<i>Preserve capital</i>

Source: UBS Warburg

Defining the return objective and risk management relative to a benchmark essentially means that the manager captures the premium for the asset class, that is, performance and volatility is attributed nearly entirely to the underlying asset class. This means the investor is exposed to the asset class on the way up as well on the way down. In other words, the investor experiences the full volatility of the underlying asset class (the benchmark). Transparency with the relative return model is high because a change in market circumstances does not materially affect the investment process and the portfolio positions. Under all market conditions, the mandate of the manager is to ‘capture asset class premium’.

Under the relative return model, the end investor is exposed to mood swings in the asset class in an uncontrolled fashion

The big difference between the two approaches has to do with the definition of risk. It is obvious that if differing managers have differing definitions of risk their risk management process will be different as a result. Relative return managers define risk as tracking risk (either implicitly or explicitly), whereas absolute return managers define risk as total risk.¹ Risk management of the former is driven by market benchmark, while risk management of the latter by a P&L (profit and loss account). Defining risk against an absolute yardstick (ie, capital depreciation) is a material departure from the relative return approach, where the wealth preservation function and therefore risk management at the portfolio level is left to the end investor.

When risk is defined as tracking risk, the control and management of total risk is left to the end investor

‘No hedge funds, please, we’re British’²

In the special case of pension funds and their sponsors, one could argue that all risk taking should be done outside the (defined benefit) pension fund. In other words, the pension fund should have a perfect duration match between assets and liabilities. This would result in pure bond portfolio being the risk neutral position. We believe there is a parallel to the corporate world: In the 1970s, the preferred corporate form was conglomerates. The cardinal idea of a conglomerate is that the corporate’s management is best suited to allocate capital between businesses. In other words, the board of the conglomerate can more effectively and efficiently diversify risk than the shareholder. This belief was replaced in the 1980s and 1990s with the corporate focusing on its core competency. This has resulted in the shareholder being free to allocate capital between businesses, projects and ideas and to efficiently diversify risk. The parallel to the asset management industry today is the debate as to who should be managing what kind of risk.

A pension fund can be viewed as a collateralised loan from the scheme members to the firm

UK pension funds are arguably among the slowest to invest in hedge funds. One of the reasons could be that UK pension funds might be going in a different direction than the rest of the world with respect to how the sponsor manages pension fund risk. In the UK, one of the major events among pension funds was what is now known as the ‘Boots case’³: – Boots PLC allocated its entire defined benefit pension fund portfolio to long-dated AAA-rated corporate bonds in 2001. In making the switch, Boots realised the surplus in its fund. Its

¹ Note that relative return managers also have an incentive to manage total risk, as a halving of assets under management, roughly halves revenues (assuming profit margins stay constant).

² Title of article in *EuroHedge*, 31 July 2000

³ Note that the shock waves from the Boots case were not limited to the UK.

projected contribution levels are now fixed in real terms and its annual management costs have been reduced from £10 million to £250,000.

Our hypothesis as outlined in the introduction of this document is built on the notion that interim volatility matters to all investors. If for example plan sponsors (in the UK or elsewhere) decide that a perfect match between assets and liabilities is the only goal of a pension fund, our hypothesis will be proven wrong or partly wrong. (A comprehensive move into bonds would also result in a paradigm shift, but not similar to the one we foresee.) It will mean that any risk will be taken outside of the pension fund, for example on the balance sheet of the sponsor directly, or by the shareholder directly. If this happens, the funds flow from pension funds into hedge funds could reverse. (The impact on equity values and valuation levels after all, or a majority of pension funds have eliminated their equity allocations, is anyone's guess.¹)

Investor protection versus capital protection

Table 2 shows a matrix comparing an investor protection function as well as a wealth or capital protection function for the relative return as well as the absolute return approach.

Table 2: Investor versus wealth protection

		Long-only	Hedge fund
Investor Protection	Regulation	High	Low
	Transparency	High	Low
	Benchmark	Yes	No
Wealth Protection	Derivatives	No	Yes
	Leverage	No	Yes
	Short selling	No	Yes

Source: UBS Warburg

Based on investor protection (regulation, transparency of investment portfolio, and market benchmark) as well as wealth protection (through risk management techniques utilising the use of for example derivatives, leverage and/or short selling), the absolute return approach could be viewed as the pure opposite of the relative return approach. Today we, the financial community, know that investor protection is not the same as protecting principal. Regulation, transparency and a market benchmark protects the investor. However, with the relative return approach, the investor's principal is not entrusted to a fiduciary who tries to preserve it in difficult times but whose mandate implicitly or explicitly dictates that the principal is exposed to the full extent of market volatility – the volatility of the market benchmark. This exposure has been considered acceptable for the past one or two decades because the wealth protection function was held by the end investor and because of some strong-held beliefs with respect to return expectations and investment processes during the long bull market.

Regulation, transparency and benchmarks protect the investor but, unfortunately, not his money

¹ One suggestion was that US stocks would fall to around book value. That would imply an index level of the S&P 500 of around 330.

The argument is that the end investor manages absolute levels of risk through asset allocation. If the end investor decides to have an allocation to long-only equities through a benchmarked manager, then obviously the manager needs to be fully invested at all times. This was supported by the beliefs that market timing does not work consistently anyway, that long-term investors (for example pension funds) need to be fully exposed to market volatility to capture the equity risk premium, and that equities outperform bonds in the long term. One of the market benchmark's purpose therefore, was to reduce uncertainty from a manager deviating too strongly from the market benchmark that was part of the asset allocation process.

End investors are grown-ups and therefore can take care of themselves

We believe that some of these long-held beliefs are currently under pressure. In our opinion, the most obvious erroneous belief is the paradox in constraining a skilled manager. If Grinold [1989] and Grinold and Kahn [2000] are right in arguing that the value added of an active manager is a function of his skill and the number of independent decisions he or she can make (breadth), that is, implying some sort of flexibility with respect to investment opportunities, then finding managers with investment skill and then constraining them cannot be efficient. It is unlikely that Warren Buffett or George Soros would have compounded at 25-30 percent for so long had they had the S&P 500 Index as their benchmark and a tracking error constraint of 200 basis points. Constraining a talented manager is like tying a golfer's legs together: He will still be able to play golf, but it won't necessarily improve his swing.

Constraining a skilled manager is like driving a Ferrari -- only backwards

The search for investment talent and the subsequent manager constraint for investor protection purposes is, we believe, sub-optimal at best and highly inefficient at worst. The hypothesis stated earlier, that is, the adoption of an absolute return approach by the active asset management industry, is essentially the synthesis of the investor protection and wealth protection functions in Table 2 (page 13). This means a skilled manager has the mandate to manage investment opportunity and balance the change in the opportunity set based on his or her individual assessment of total risk. The flexible and benchmark-free mandate is, we believe, superior to a constrained mandate if we assume that it is a manager with an edge close to the investment opportunity who is best suited to judge when the opportunity changes its characteristics.

The introduction of a market benchmark hinders the manager's ability to manage total risk, even in the case where he has an edge in doing so

This paradigm shift is, obviously, only going to happen if the fee-paying end investor buys into it (that said, we actually believe the shift is already well underway.)

Systematic versus non-systematic risk

Another way to contrast the relative return approach with the absolute return approach, with respect to transparency and risk, is to distinguish between systematic and non-systematic risk. Table 3 classifies financial risks as systematic risk, that is, risk the investor can expect to get compensation from taking; and operational risk, which we believe is purely idiosyncratic risk, that is, should be eliminated through diversification as it carries no premium.

Table 3: Systematic versus non-systematic risk

		Traditional asset management	Hedge fund
Systematic Risk			
Financial risks:			
	Market betas	Constant	Variable
	Volatility	Unmanaged	Managed
	etc.	Unmanaged	Managed
Non-systematic risk			
Operational risks:			
	Alpha	Variable	Variable
	Default risk	Low	High
	Key person risk	Low	High
	Model risk	Low	High
	etc.	Low	High

Source: UBS Warburg

The only common denominator between the traditional asset management industry and the hedge funds industry from Table 3 is with respect to alpha: both industries promise alpha and, according to some fee-paying and cynical investors, both fail to deliver on a net basis.

Systematic risk

Market betas are systematic risk. A benchmarked relative return manager will have a mandate that dictates that the beta is fairly constant. If it is an active mandate, the portfolio can have a small degree of variation in beta, for example, by tilting the portfolio to high beta stocks relative to the equity market benchmark. However, the overall beta is constant when compared to absolute return managers, as it is part of the mandate. The benefit to the end investor is that it allows for proper asset allocation as well as risk budgeting. Without this consistency in beta exposure, the transparency to the end investor is largely compromised or non-existent.

Given that the absolute return manager focuses on total risk as opposed to tracking risk, other systematic risk factors are managed actively. Managing risk is not the same as hedging the risk (hedging risk is the opposite of taking risk while managing risk is the opposite of ignoring it); that is, it is the manager's call to be exposed to any sort of volatility in an underlying asset class, any spread or illiquid instrument. Transparency, therefore, is much lower to the end investor. The cry for transparency on the part of the institutional end investor is understandable. Transparency is required to fit these new instruments into a traditional framework of the existing investment process. Potentially, and at this

Investors should expect to be compensated for bearing systematic risk

The active asset management industry is built on the premise and promise of alpha

A long-only buy-and-hold strategy implies beta is fairly constant

Flexible mandate results in lower transparency

stage, this is a hypothesis – the ‘traditional framework of the existing investment process’ needs revisiting.

Many investment professionals who have been in the hedge fund business all or most of their professional career view a long-only buy-and-hold strategy as much more risky than, for example, a relative value or event-driven strategy, that is, what today is referred to as an ‘alternative investment strategy’. For at least some of them, a typical pension fund is following a strategy that is of higher financial risk than the strategy they pursue. An amusing anecdote from our perspective as observers is that both, pension funds and AIS staff, believe their strategy to be conservative.¹ A pension fund with a 75:25 mix between equities and bonds, for example, is fully exposed to the volatilities and correlations of these two markets. They are sailing ‘Against the Gods’.² The total risk is unmanaged (in practice, although not in theory). No wonder then, that a majority of fee-paying institutional investors preferred to hand mandates to managers who have an approach that does not have managing total risk as a primary objective. Financial conservatism is indeed in the eyes of the beholder.

Risk aversion is in the eyes of the beholder

In Warren Buffett’s opinion, the term ‘institutional investor’ is becoming an oxymoron: Referring to money managers as investors is, he says, like calling a person who engages in one-night stands romantic.³ Buffett is not at par with modern portfolio theory. He does not run mean-variance efficient portfolios. Critics argue that, because of the standard practices of diversification, money managers behave more conservatively than Buffett. According to Hagstrom [1994], Buffett does not subscribe to this point of view. He does admit that money managers invest their money in a more conventional manner. However, he argues that conventionality is not synonymous with conservatism; rather, conservative actions derive from facts and reasoning.

Conventionality is not the same as conservatism

Non-systematic risk

While financial risk is, we believe, most often lower in the case of the absolute return industry,⁴ quite the opposite can be true for operational risks. The investor’s risk to the operation is higher with hedge funds than it is with traditional asset managers (this is a generalisation). Operational risk, however, is non-systematic or idiosyncratic risk. This means exposure to non-systematic risk does not carry an economic risk premium (unlike exposure to systematic risk).

Investors who have lost money due to a concentration of non-systematic risk have only themselves to blame

¹ Another, in our opinion, amusing anecdote is that Warren Buffett is perceived as the ultimate long-only investor. This is amusing because Berkshire Hathaway is much closer to a multi-strategy absolute return vehicle than a benchmarked long-only vehicle: Warren Buffett is not indifferent to overall valuation of a stock market (ending predecessor partnership in 1969 due to the lack of value), exploits short volatility strategies (current insurance business; risk arbitrage in the 1980s), is actively involved in distressed securities (bailing out Salomon Brothers in 1991, offered to bail out LTCM in 1998), etc.

² As in Peter Bernstein’s 1996 book on risk.

³ From Hagstrom [1994], p. 73

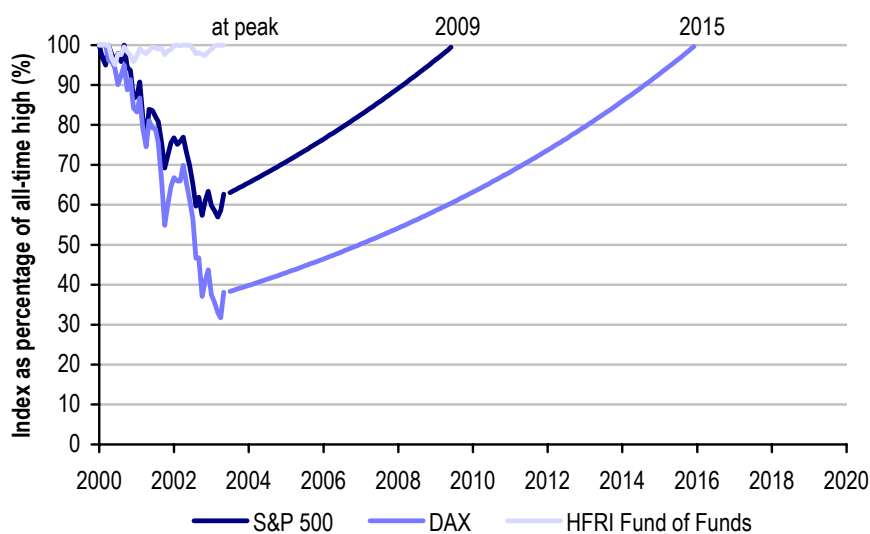
⁴ Financial risk of, for example, a market neutral manager is probably lower than with a macro manager. However, the common denominator and the difference to benchmarking is that total risk is actively managed by the manager.

One could view a hedge fund as of similar operational risk as an early stage venture capital firm in the private equity market or a micro cap (small small cap) in the stock market. Many hedge funds start as a small operation where their own money is managed next to some funds from friends, family and quite often former colleagues. This start-up phase, obviously, is of much higher operational risk than for example a multi-billion dollar traditional asset management firm. As the absolute return management operation moves through its own life-cycle, this idiosyncratic risk – assuming going concern – decreases (quite often in line with returns).

Idiosyncratic risk with any new and small operation is high

To some extent this is a contradiction: On one hand we argue that there is no compensation for bearing idiosyncratic risk, on the other we observe that returns are quite often higher when managers are smaller (and leaner), but idiosyncratic risk is higher. We therefore suspect that there is some sort of inflection point where size and maturity of the operation is just about right (ie, reasonable idiosyncratic risk) but the nimbleness and flexible manoeuvrability and entrepreneurial incentives are still intact (ie, reasonable returns). Our recommendation is to diversify the maturity life-cycle, that is, include early, medium, and later stage hedge funds in an AIS portfolio.

Chart 3: Under water perspective



Source: UBS Warburg (based on data from Datastream and Bloomberg)
 The lines measure an index as a percentage of its previous all-time high. The two upward sloping lines illustrate the time to recover from recent losses if we assume an annual growth rate of 8% and assuming volatility is zero. All indices are in local currencies (US\$ for HFRI) and are total return indices.

The distinction between systematic and non-systematic risk is cause for some debate on the regulatory front. Many regulators have already viewed, or are in the process of viewing the financial risk of a diversified portfolio of hedge funds as lower, for example, a diversified portfolio of stocks (graphs such as Chart 3 might or might not help accentuating this point of view¹). Part of the debate, however, is based on the question of whether a single hedge fund should be compared to an investment in a single stock or a single mutual fund. If a single

Single hedge funds can be compared to stocks, while fund of hedge funds could be compared to mutual funds

¹ The graph also supports our claim that while a long planning horizon is laudable, interim volatility matters too. We will be more specific on this issue later in this document.

hedge fund is compared to a mutual fund, then the idiosyncratic risk is most often higher or much higher with the hedge fund than it is with a benchmarked long-only fund (eg, a mutual fund) of a large and established asset management firm. The comparison between a hedge fund and a mutual fund is much more frequent than a comparison between a hedge fund and a single stock investment. However, from an idiosyncratic risk and portfolio construction point of view, one could argue that single hedge funds are more comparable to single stock investments, while fund of hedge funds could be compared with mutual funds. Both diversify idiosyncratic risk. However, there is a big difference in accessibility to small investors. It is possible to diversify a stock portfolio with US\$10,000. This is impossible with hedge funds.

In the stock market, even retail investors know either implicitly or explicitly the concept of diversification, that is, that risk is reduced by not holding just one stock but many. The same logic applies to hedge funds. The common denominator with stocks and hedge funds is that occasionally a company as well as a hedge fund goes bankrupt – either due to fraud or some other failure. However, while any kind of bankruptcy is unfortunate, single entity bankruptcy risk is fully diversifiable risk. The difference between single stock investments and single hedge fund investments though, is the correlation among the single portfolio constituents.

With stocks, as we know today, correlation is high and is even higher in a bear market or during an economic shock situation. The correlation among different single hedge funds is of a completely different nature, than the correlation characteristics in the stock market. In addition to lower correlation coefficients, the variance of the correlation statistics is lower with hedge funds too:– a Bermuda-based CTA manager trading pork belly futures (among other commodity futures), a Scandinavian long/short equity manager concentrating on global ship building stocks, and a Japanese distressed debt manager, have little in common – even when pork bellies are in a bear market and all CTA managers happen to find themselves on the wrong side of the market. In other words, not only is correlation among constituents lower than with stocks, the correlation is also more stable than it is with stock portfolios.¹ This low correlation and the stability of its constituents' correlations enables the construction of conservative, that is, low volatility portfolios. Five years ago, only a minority of investment professionals fully appreciated this (and the author was not among them).² We believe it was the lack of appreciation about the importance of correlation in portfolio construction in understanding financial conservatism in the 1982-2000 bull market.³ However, the situation has changed.

Corporate failure is an unfortunate fact of business

Volatile constituents can be part of a conservative portfolio as long as correlation is very low and stays low

¹ While low correlation is the rule, there are exceptions to the rule. Short volatility strategies, for example, have high correlation in dislocating or extreme market conditions. This event-type risk can be partly offset by holding long volatility strategies, as well as short volatility strategies. Nevertheless, a perfect storm scenario remains a possibility for all portfolios.

² In UBS Warburg's *Lemmings and Pioneers* [2002f] we pointed out that potentially pioneers and early adopters capture an economic rent that is not available for the lemmings who follow the pioneers. In this report we call this the 'musical chair effect'.

³ Reason never causes a paradigm shift – an event is needed too. It wasn't the idea of 'liberty, equality, fraternity' alone that widowed Marie Antoinette.

From a regulatory point of view, we believe, this distinction between systematic and non-systematic (in addition to systemic) risk is important. The function of any regulator is to protect the investor (Table 2, page 13.) If a naïve investor confuses a hedge fund for a mutual fund (as the two terms, for example, phonetically sound similar), then there is the risk that the investor is misled, irrespective of whether the financial risks of the hedge fund are lower than the financial risks (beta) of the long-only manager. The typical naïve investor will assess the bankruptcy risk of a typical mutual fund to be very low. In theory, if the idiosyncratic risks of single hedge funds are compared with the idiosyncratic risks of stocks, it is not entirely clear why the naïve investor can risk his financial wealth with single stocks but not with hedge funds. In practice, this line of argument depends on the amount of capital the naïve investor has at his disposal, because access to single hedge funds is different from access to single stocks.

The question for regulators is whether the naïve investor needs protection from dangerous financial instruments or from himself

Conclusion

An investor (institutional or private) allocating money to an absolute return manager essentially hands over the mandate to manage total risk to the manager. This is one of the main differences to the relative return approach, where the manager does not have a mandate to manage capital at risk, but has a mandate to manage tracking risk relative to a market benchmark. The absence of a market benchmark, has one major disadvantage, that is, it will result in lower transparency.

The relative return approach has some great advantages as it allows the end investor to undertake a fairly accurate asset allocation and budget for market risk factors. The desire to turn the absolute return approach into a relative return approach to capture the advantages of the latter is understandable but, potentially, unwise. Investors demanding transparency for asset allocation and risk budgeting purposes, in our opinion, should be focusing on the manager's ability to manage (as opposed to measure) risk. This task is labour-intensive, subjective by definition and qualitative in nature (we are not at all implying that this is an easy job, neither are we implying that all investors are equally equipped to do the job). However, it seems that the main focus today, with respect to transparency and risk, is the search for an all-inclusive risk measure. While this search is commendable, it could also be a move in the wrong direction.

If our hypothesis from page 3 turns out to be wrong (which is a possibility), then it is because the institutional end investor continues to perceive the utility, from being able to control asset allocation and budget for risk accurately, as higher than the utility from asymmetric returns.¹ Although we feel quite strongly about the absolute return approach taking over, there is one major reason why one could oppose our view: change. It is pretty safe to assume that the absolute return industry cannot continue to deliver these superior risk/return profiles if everyone on the planet gives them their money. We are strong believers in the contrarian approach: The hedge fund industry is (or was) attractive as long as

¹ We explain the term 'asymmetric returns' in UBS Warburg *Asymmetric Returns* [2002c] and on pages 23 and 32 of this report.

everyone believed it was not. Up until recently, the hedge fund industry, we believe, was populated with the best risk managers. This was possible because an extreme selection process took place (as barriers to entry were high) as only about 1% of the investment community thought of hedge fund investing as a good idea. However, this situation is changing. An industry or investment process that 99% of the investing public believes is a bad idea is not the same as an industry that 99% of the investing public perceives as a good idea.¹ We compare this with musical chairs: if you have fast research and decision-making capability, you are quicker adapting to change and are, eventually, better off. There are potentially no gifts for the marginal investor.

Over the past three years, investing in hedge funds gained popularity. However, this is part of a problem. Throughout the 20th century, investing through a buy-and-hold long-only strategy in the equity market was a good idea. However, in the past, it seemed to have been a better idea when everyone thought it was a bad idea (as price change happens at the margin). Coming out of the inflation-prone 1970s, equity investments were not popular. Interest rates were high, and equity valuations low. We would not consider the mood change that followed in the 1980s a paradigm shift but rather a turning point in a cycle. Potentially our hypothesis is wrong and the increase in demand of hedge fund products is not a paradigm shift (what we believe) but just part of a cycle, as hedge funds already have once been popular in the late 1960s but then encountered some difficulties in 1969 and early 1970s. History, we believe, shows that there are both cycles and paradigm shifts. Distinguishing the two, potentially, is difficult.

We believe that the difference between risk measurement and risk management with respect to transparency and risk is an important one. Risk measurement is fairly objective. Risk management, however, is subjective by definition as well as by comparison. The heterogeneity of the hedge funds industry with respect to the way risk is managed in combination with the observation that the hedge fund industry were able to steer through the difficult past three years more or less (financially speaking) unharmed, is an indication that this might be true. Our main point is that the pure reliance on a process or a few metrics is very dangerous. We believe therefore that a dynamic and flexible approach to risk management is superior to a static (purely rule-based) and dogmatic process. With respect to transparency, this means that investors' demand for transparency should not interfere with the nimbleness and flexible manoeuvrability of the manager.

The confusion between risk measurement and risk management also has some beneficiaries. As Mr. Levy [2002] put it:

¹ We have discussed bubble-like phenomena and excess expectations regarding hedge fund returns in UBS Warburg *The Search for Alpha Continues* [2001] and *Return Expectations* [2002e]. If we are about to witness a hedge fund boom and bust cycle, the "bust" sequence will, we believe, be of a different nature than the popping of an asset bubble. The performance of hedge funds (irrespective of whether viewed as separate asset class or, as we believe, part of asset management industry executing alternative investment strategies) are intangible, whereas assets (equities, properties, timber, etc) are tangible.

'Most people believe that markets are driven primarily by economic factors, and that psychology plays a minor role.¹ I take the position that markets are driven by both psychological and economic factors. I owe great debt to economists for their inability to acknowledge the degree to which psychology moves markets. (In this sense, it's unfortunate that economics now seems to be embracing psychology.² I suspect that economists will always retain the illusion that numbers can capture mood).'

If a hedge fund manager can say that his daily VaR (Value at Risk) is US\$4.33m, and explain the assumptions behind the figure, and, if need be, pop into the fund's own library and get copies of all relevant papers on the subject, then this surely is a blessing. However, it does not tell the investor a lot about risk management skill and expertise. Risk management is the judgement call that (apart from questioning the US\$4.33m figure) relates the total capital at risk with the investment opportunities the fund is exposed to. In addition, managing risk is a much broader task than just measuring it. Most importantly, it is the observation skill of the manager in noticing early when the risk/reward relationship is changing to the portfolio's disadvantage. Successful investing, we believe, has not only to do with often getting the entry strategy right, but also the exit strategy. Since this skill is, we believe, scarce, it carries a fairly high price tag. Chances are that anything that is easy carries a low price tag. This leads us to the next issue: Fees.

¹ Note that Robert Shiller [1981, 1989] showed that around two-thirds of the volatility in equities cannot be explained by changes in fundamental variables. Black [1986] phrased the term 'noise.'

² The incorporation of psychology and human (mass) behaviour in economics in general and finance in particular is, we believe, a positive trend. However, what we find rather interesting is that there are some pretty strong parallels between what today is referred to as 'behavioural economics' or 'behavioural finance' and what Ludwig von Mises was writing in *Human Action* in the 1940s. (In UBS Warburg *Watching Flows* [2002b] we discussed Ludwig von Mises' Praxeology.) To us it seems, that it probably didn't pay to speak German and/or be Austrian during the early part of 20th century history. This bias (or ignorance) in economic thinking allowed many investors – it seems – to make a lot of money. One could argue that the worst-case scenario for macro hedge funds would be if central bankers and all market participants suddenly had an unbiased view of the world.

Absolute fees and absolute returns

'Words ought to be a little wild, for they are the assault of thoughts on the unthinking.'

John Maynard Keynes

An evergreen issue re-visited

Fees are an evergreen issue in the hedge fund industry. Generally speaking, they are considered as too high. Our experience is, unlike what some of the hedge fund investor surveys suggest, that investors are not indifferent to the level of fees (someone even entrusted us with their thoughts to write a book called *Absolute Fees* in response to recent hedge fund performance, and in lieu of the Wiley book entitled *Absolute Returns*.)

Investors are unlikely to be indifferent to the level of fees

One of the arguments against hedge funds is that fees are higher than with mutual funds. Below is a paragraph from an article discussing Sir John Templeton's general views in a recent Monday supplement of the *Financial Times* (FTfm from 31 March 2003):

Sir John suggests that anyone with \$10m or more should do most of their investing through mutual funds. He doesn't like hedge funds. 'The difference in a good mutual funds is only 2 per cent,' he says, "whereas hedge funds charge fees that are much higher than that."

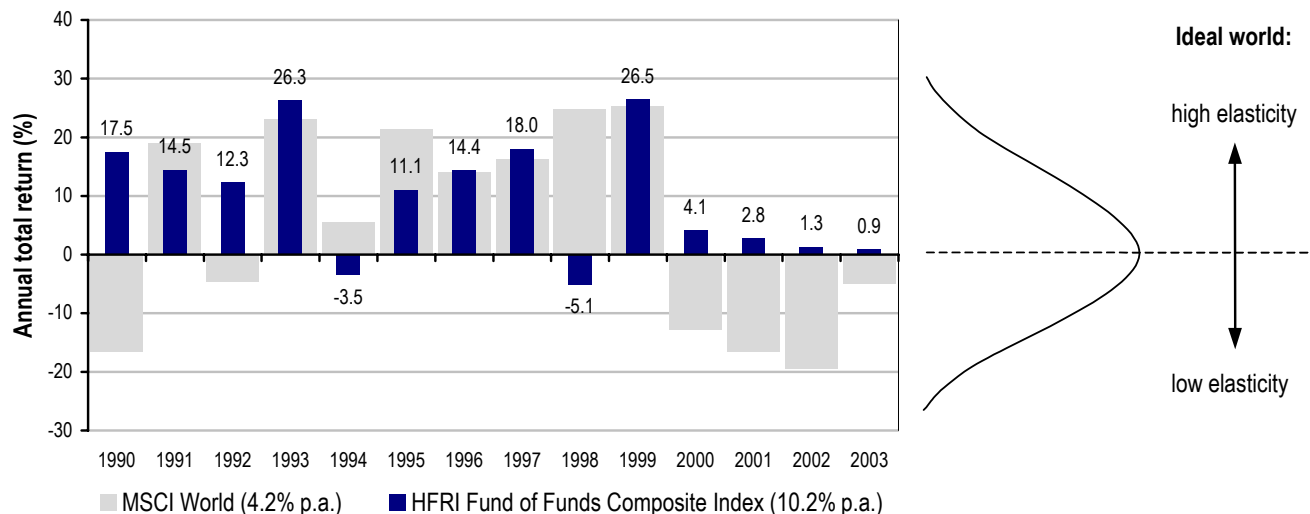
If someone had sold his company for US\$10m and invested in mutual funds in 2000, he or she would now be holding around US\$5m in mutual funds. At current volatility levels of 30%, he or she would have a net wealth of between US\$3.7m and US\$6.8m with a 68% probability (assuming real mean total return is 5%) in one year from now, or between US\$2.8m and US\$9.1m with 95% probability. This, in our view, could be viewed as speculation, as these ranges are extremely wide and, more importantly, the investor is exposed to the ranges in an unmanaged fashion. If mean and standard deviation remain unchanged, the one and two sigma ranges for the US\$5m long-only investor after five years are US\$2.6m and US\$10.0m for 68% probability and US\$1.3m and US\$19.5m for the 95% probability range. Putting it differently: at current volatility levels, the US\$5m ex-entrepreneur long-only investor has a 16% probability ($[1-0.68]/2$) of recovering from his 50% losses in five years from now (assuming normal distribution). The problem, however, is that there is also a 16% probability that he will not be a US\$5m long-only investor, but a US\$2.6m (or worse) long-only investor in five years time. Given these extreme ranges of possibilities, he or she, potentially, got advice that was not in line with individual preferences. The fact that mutual funds charge lower fees than hedge fund is to some extent, we believe, missing the point.

Not all advice trades at a premium

The ‘point’ is best described, we believe, with the concept of asymmetric returns.¹

Chart 4 compares annual total US dollar returns of the HFRI Fund of Funds Composite Index with the MSCI World from 1990 to February 2003. The annual compounding rates are shown in brackets in the legend of the graph. Whether there is a 200-300 basis points survivorship bias in annual hedge fund returns is not relevant for this illustration.

Chart 4: HFRI Fund of Funds Index versus MSCI World Total Return Index, 1990-2003



Source: UBS Warburg (based on Data from Bloomberg and Datastream)

The graph demonstrates the difference between volatility on the upside (positive returns) and downside (negative returns). Whether zero or the risk free rate is taken as the separation point of upside and downside is not important for explaining the concept of asymmetric returns. The magnitude of the dark bars in Chart 4 are roughly the same as the magnitude of the light grey bars. In other words, volatility on the upside (above zero or above the risk-free rate) is similar.² However, the big difference is on the downside. The magnitude of the dark bars on the downside are of a completely different dimension than the magnitude of light grey bars (MSCI World).³ The volatility of negative returns is much lower for diversified hedge funds portfolios than it is for diversified equity portfolios. Another way of explaining this is with the concept of elasticity: hedge fund returns should be elastic on the upside, but inelastic (or,

Investors are unlikely to be indifferent to magnitude of losses, ie, downside volatility

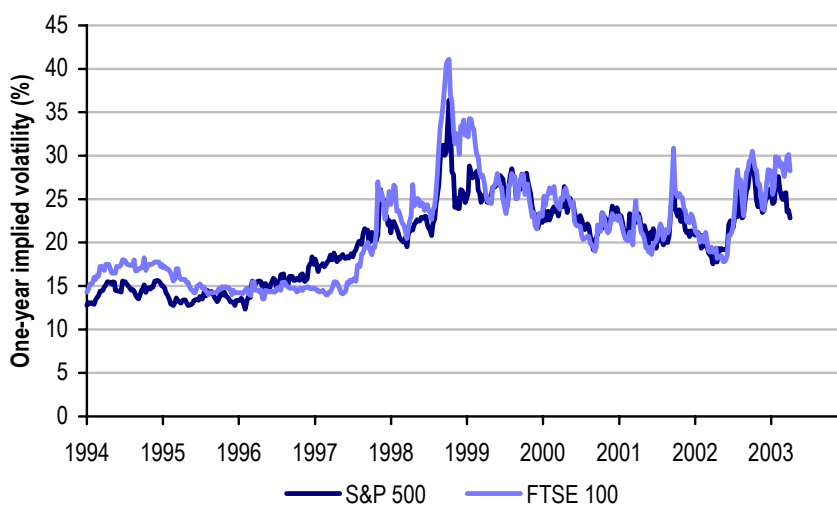
¹ See UBS Warburg *Asymmetric returns* [2002c] or Ineichen [2003a,b].

² This concept, we find, is difficult to bring across. One reason could be that we are a little short on established theory on this point. There is no widely accepted metric to explain what we call ‘asymmetric returns’ (although ‘omega’ comes close, see ‘Just a moment...’ in UBS Warburg’s *Food for Thought* [2002g]). Some of our remarks in footnotes that some macro managers are managing money more conservatively than most UK pension funds (until recently 75% in long-only equity) probably doesn’t help either. Scientific argument, logic and reason only bring you thus far. Events are needed as well. The arguments for absolute return investing were as strong 10 years ago as they are now. However, it needed a bear market for hedge funds to become en vogue with investment professionals and their clients.

³ The difference is so big that most of the debate on survivorship bias, in our view, is not that relevant. In addition, historical returns are not necessarily a valuable guide for future returns anyway. However, the desire and incentive to use risk management for the purpose of avoiding large drawdowns and negative volatility is sustainable.

and this is important, less elastic) on the downside. Inelasticity or zero elasticity on the downside is the ideal world. The reason why we are bullish on the absolute return approach is because it makes a lot of sense to us that managers control exposure to upside volatility differently to downside volatility. (Making money is not the same as losing it). An investment opportunity is then attractive when there is an asymmetry between the probability of making a profit and the probability of losing capital. The absolute return approach simply implies that the end investor (private investor, insurance company, pension fund, etc.) is not indifferent to swings on the downside (negative volatility). It is understandable, that the organisations who pass on these (superior) asymmetric returns to the end investor, find themselves in the favourable position to charge high fees. However, as the history of economics somewhat hints, high fees have a tendency to turn into low fees over time.

Chart 5: S&P 500 and FTSE 100 one-year implied volatility



Source: UBS Warburg

The reason for asymmetric versus symmetric returns has to do with the mandate of the manager, as discussed earlier in this report and previous papers. The relative return manager does not have the mandate to ‘manage the curve’¹, that is, it is the market that determines how returns are distributed. One-year implied volatility for S&P 500 and FTSE 100 options was 13.8% and 14.2% in December 1995, and 23.3% and 23.1% in December 1999, with interim peaks in the 30s and low 40s. (Chart 5.) The absolute return manager has a mandate to manage the elasticity of these returns. On the upside, the higher the volatility the better; and on the downside, the lower the volatility the better. The way the absolute return manager achieves this asymmetry is by balancing investment opportunity with capital at risk: if opportunities are plentiful, the manager will put a high amount of capital at risk or, in some cases, lever up. If opportunities are scarce, the manager will, de-lever and/or move into the money market, that is, have less capital at risk. In addition, the absolute return manager prefers a situation where predictability is high (eg, arbitrage between a mispriced

The absolute return approach is a balancing act between exploiting opportunities and managing total risk

¹ By “curve” we mean the way returns are distributed around a mean, see UBS Warburg “Managing the Curve” [2002d].

derivative and its synthetic) over a situation where the outcome is highly random (eg, buy-and-hold strategy of an asset class).

This brings us back to our definition of risk, namely, that risk is defined as ‘exposure to change’. We believe change is extremely relevant for the absolute return approach, as there is a (moving) inflection point or zone between plentiful opportunities and scarce opportunities. The manager is paid to notice early on when the investment opportunity (more precisely the risk/reward relationship) changes. This is quite important because it is commonly held that the manager is paid for exploiting ‘proven market inefficiencies’, or picking up long established risk premiums and/or should be fully invested at all times. We challenge these views for one major reason: change.

Market inefficiencies and investment opportunities do not hang around forever, they come and go. The absolute return manager, therefore, is not only paid to find these opportunities. He is, in our view, also paid to notice early when the opportunity is gone or the risk/reward relationship is in the process of changing. We believe exit strategies are at least as important as entry strategies (one could easily argue that the former is more important than the latter). Most market opportunities change over time. The most obvious determinant is capital: if the opportunity is flooded with capital, the opportunity goes (or changes materially). An inefficiency disappears (or changes, eg, become more risky) once everyone tries to put on the trade. This is also relevant for transparency: In a game of poker, showing your hand to the other players is not necessarily a promising way of winning the game. As Mr. Bernstein put it:

Because of the danger that free-riders will hop aboard a successful strategy, it is quite possible that there are investors out there who beat the market consistently beyond the probability of luck, but who stubbornly guard their obscurity. Nobel Laureate Paul Samuelson, an eloquent defender of the hypothesis that markets act as though they were rational, has admitted that possibility: ‘People differ in their heights, pulchritude, and acidity, why not in their P.Q., or performance quotient?’ But he goes on to point out that the few people who have high P.Q.s are unlikely to rent their talents ‘to the Ford Foundation or the local bank trust department. They have too high an I.Q. for that.’ You will not find them on Wall Street Week, on the cover of Time, or contributing papers to scholarly journals on portfolio theory.¹

Mr. Samuelson’s point of view, we believe, also supports our claim that the manager selection process (hiring and firing) is difficult and expensive in practice (as opposed to easy and cheap). We therefore still believe fund of hedge funds have a sound value proposition, a claim first published in UBS Warburg’s *The Search for Alpha Continues* [2001].

Change is the only certainty in the game of risk

In a game of poker, showing your hand to the other players is most likely unwise

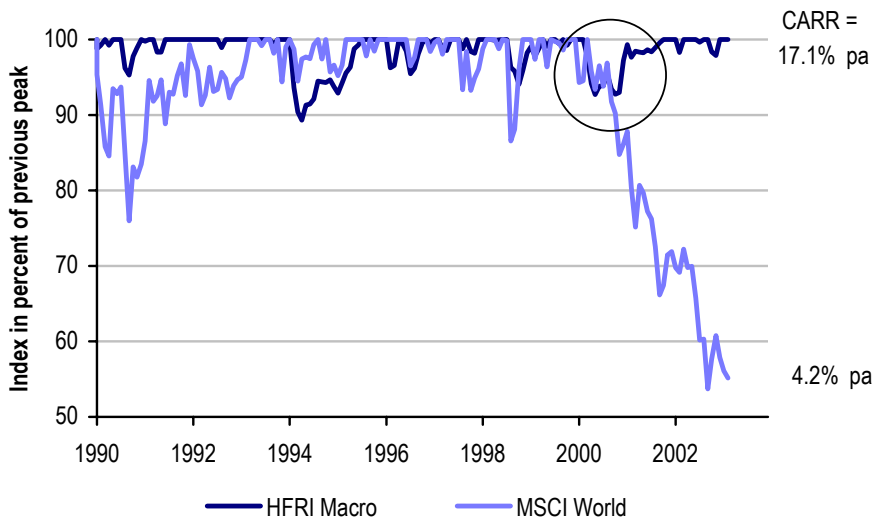
Playing a risky game with a competitive disadvantage might not be a good idea

¹ From Bernstein [1996], p. 299

Example

Chart 6 shows one example. The graph shows the underwater perspective (index level as a percentage of previous all-time high) for a diversified portfolio of macro managers and a diversified portfolio of stocks. Both indices are based on monthly US dollar total returns from January 1990 to February 2003.

Chart 6: HFRI Macro Index versus MSCI World Total Return Index, 1990-2003



Source: UBS Warburg (based on Data from Bloomberg and Datastream)
 CARR = Compound annual rate of return

In second quarter 2000, macro managers were cause for negative headlines due to larger-than-average drawdowns (the fact that some of these managers had been compounding at 20-30% per year was not that relevant at the time). Some of the better-known managers experienced drawdowns and, as a result, mass redemptions.¹ At the time macro managers, as a group, did not anticipate the bear market (especially not its magnitude).² So market timing is not the issue. The main point is that in the first half of 2000 the game changed. The risk/reward relationship changed. Most people knew that the late 1990s were extraordinary in terms of annual equity long-only returns (some well-known bears were bearish as early as 1995). However, no one really knew when the music was going to stop. Only a very small minority noticed at the market peak that the game was going to change. All others noticed the change too early or too late.³ As a result of spotting change, the portfolio of an absolute return manager changes. Whether a benchmarked long-only manager spotted change or not is not relevant, since he does not have the mandate to do anything about it anyway. Risk management, that is, controlling downside volatility, in case of benchmarked portfolios is left to the end investor. With the absolute return approach, on the other hand, it is the manager who decides upon the relationship between portfolio and capital at risk.

Being benchmarked is the opposite of managing total risk – as adapting to change is constrained

¹ Or the other way round. Losses can lead to redemptions as well as redemptions to losses.

² Most investors and managers who anticipated the bear market, did most of the anticipating too early.

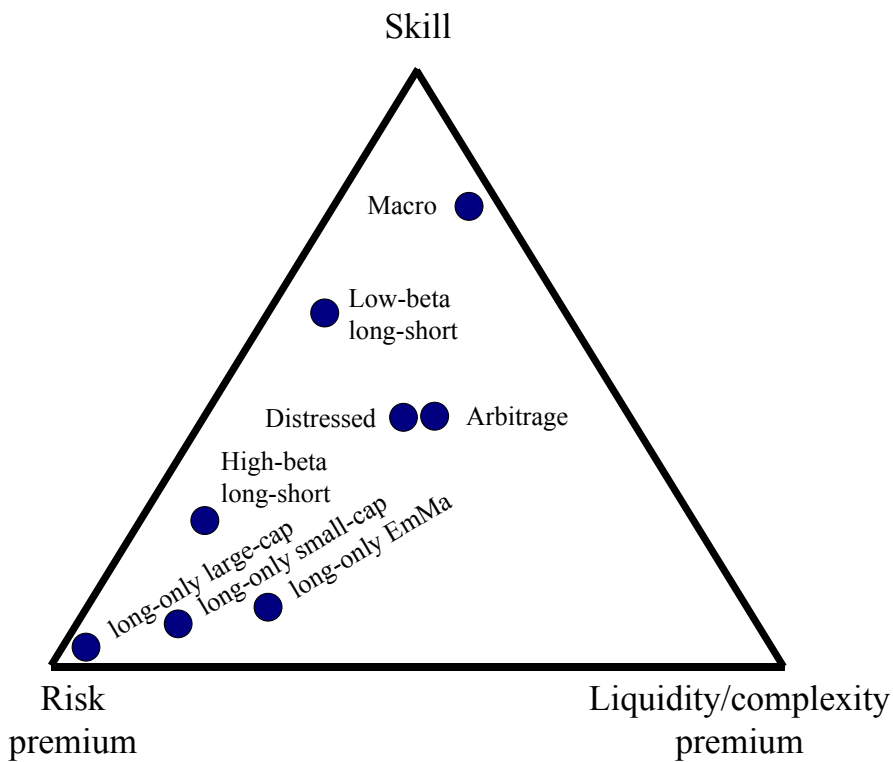
³ Essentially all those who financially still rely on some form of economic activity.

Paying the milkman thrice

What should the investor pay for? Chart 7 is an attempt to isolate the cost sub-factors an investor pays to the manager. We have assumed that performance is attributable to three elements, namely manager investment skill, a premium for liquidity and/or complexity, and an economic risk premium. We have also assumed that these three elements carry different price tags and that many investment strategies are a combination of the three elements.

Should an investor pay for alpha or for beta?

Chart 7: Skill versus economic and liquidity premiums



Source: UBS Warburg

We have placed long-only exposure to large caps in a developed economy in the left corner as it passively attainable, that is, the return can be captured without the presence of investment skill (index funds, ETFs, swaps, etc) and does not carry a premium for complexity or the lack of liquidity. Moving to the right, we have placed small cap long-only and emerging markets (EmMa) long only. Those disciplines carry an element of investment skill because the information gathering process has a (empirically justified) positive expected return and liquidity is lower.

Long-only strategies are typically buy-and-hold strategies, that is, market-based strategies

There is disagreement with respect to whether there is such a thing as 'complexity premium'. We recently came across a research report that stated that there were only two factors driving returns, an economic risk premium and investment skill. Skill was defined as outsmarting other market participants, and capturing an economic risk premium was defined as something which could be done entirely passively, that is, at low cost without the presence of skill. The report went on to make fun of relative-value managers because the captured premiums were just free money lying on the street and anyone could pick it up.

This goes to show that, as the industry becomes institutionalised and mainstream, the amount of printed nonsense increases disproportionately.

The author of this report has spent 14 of his 15-year tenure in derivatives, and still does not understand, for example, convertible bonds (a derivatives instrument). This can mean one of two things, of which we would rather only discuss one: it means that the CB market and arbitrage strategies within the CB market are not that simple. The investment professionals who execute these strategies are not necessarily just researchers, but also craftsmen. Knowing and understanding option pricing theory in combination with knowing how to use a computer is surely a blessing. However, knowing how to use (risk management) tools in theory is not the same as using them in practice. The interpretation of short-term information and capital flows is important too. While the author would be capable of explaining CBs to his five year old daughter or a pension fund trustee (both of whom know little about derivatives – although the former is eager to learn) it does not automatically result in applicable skill to succeed and survive in the CB market place. Unlike some other market observers, we have great respect of the managers unlocking these kinds of risk premiums and managing portfolio total risk. We strongly recommend that the ignorant do not start trading convertibles. (Neither should the cynic.)

As we have mentioned in the introduction, we believe risk management is probably at least as much a craft as it is a science. We therefore believe that two managers with identical information and identical entry strategies can still have material differing performances because of differing exit strategies. While we have mentioned trading savvy as being important elsewhere, we would like to stress that trading skill is potentially even more important. Our interpretation of Grinold and Kahn's [2000] law of active management suggests that pulling the trigger often is beneficial. However, hitting the target often is pretty important too.

Arbitrage strategies such as CB arbitrage, risk arbitrage and fixed-income arbitrage were placed in the middle of Chart 7 (page 27) as the return is a function of all three elements, that is, investment skill, an economic premium (for example for being short volatility) and the degree of complexity being of a higher dimension than for a long-only investment style (assuming non-linear return payoffs are more complex than linear ones, and assuming operating in illiquid markets is more difficult than manoeuvrability in liquid markets). Any return from distressed securities is also a function of an economic risk premium (long distressed securities), skill (as there is no passive alternative and gathering information makes sense), and a premium for the lack of liquidity. Long-short equity is primarily a function of the equity risk premium and skill depending on the average beta of the manager.

Ignorance is probably the safest way to lose money

"If you think education is expensive, try ignorance."

Derek Bok (former Harvard President)

Skill as well as breadth is important

Relative value strategies are a mixed bag of alpha, beta and some other things

Macro was placed in the skill corner (which probably will please macro managers). There is no premium for complexity (which probably will displease macro managers) or economic risk (as the directional exposure is biased towards market timing or an investment theme, as opposed to capturing an asset class premium). There is some premium for the lack of liquidity.

How does this relate to fees? Table 4 is an attempt to relate fees to the three performance elements discussed above. This analysis is very rudimentary. The goal of this comparison is to gain some idea of what an investor should be paying a manager for. The issues are more complex than can be displayed by a table and a graph showing a triangle.

We have given the three elements a weighting (row titled value contribution factor). We assumed that skill is 10 times as valuable as capturing an economic risk premium and liquidity/complexity premiums are somewhere in between. Then we allocated six points to a selection of investment strategies (traditional as well as alternative). We have allocated the same amount of points to all strategies to avoid implying that one strategy is superior to the other. The total column measures the product of the value contribution factor times the allocation of points. The last column shows the ranking of the total column.

'More money is probably lost by people who attempt to invest their money conservatively and sanely, but ignorantly, than is lost by those who enter into frank speculations.'

John Moody

The higher the alpha, the higher the fees

Table 4: Fees in relation to skill, liquidity, complexity and risk premiums

	Skill	Liquidity/ complexity premium	Risk premium	Total	Rank
Value contribution factor	10	5	1		
Long-only large-cap	0	0	6	6	11
Long-only small-cap	1	1	4	19	9
Long-only EmMa	1	1	4	19	9
Market neutral	2	2	2	32	3
CB arbitrage	2	2	2	32	3
FI arbitrage	2	2	2	32	3
Risk arbitrage	2	2	2	32	3
Distressed securities	2	2	2	32	3
Long-short, Beta = 0.2	4	1	1	46	2
Long-short, Beta = 0.8	2	1	3	28	8
Macro	5	1	0	55	1

Source: UBS Warburg

Note: six points have been allocated to skill, liquidity/complexity premium and risk premium for every strategy. Points are then multiplied with the value contribution factor and then summed and the product ranked.

- Performance attribution from a long-only strategy in large caps should have the lowest fees. There is no skill involved (because empirically the expected excess return from gathering information is zero or, after fees, negative) and liquidity is high and complexity low.¹ Performance attribution from other

¹ One could argue that long-only managers charge similar fees than hedge funds. If 90% of the portfolio is held as dead weight (positions held to control tracking risk and where the manager has no insight) and fees are 30 basis

long-only strategies (for example small caps and emerging markets) carry some premium for skill (as empirical evidence suggests that gathering information makes sense) and there is a premium for the lack of liquidity in small caps and emerging markets.

- Performance attribution of relative value strategies (market neutral and arbitrage) is balanced between skill, economic premiums and a premium for liquidity and/or complexity. The same is probably true for distressed securities. The complexity premium is probably higher with relative value strategies, and the liquidity premium higher for distressed securities. The economic premiums are difficult to replicate passively, that is, without skill. Information is scarce and difficult to obtain and assess. In other words, gathering information and managing risk can add value. We have associated non-linear return payoffs of (for example) short volatility strategies as more complex because, among other considerations, most off-the-shelf portfolio management software still cannot deal with portfolios including derivatives.
- Long-short equity is, in our view, a very heterogeneous sub-industry. One could argue that if performance attribution is primarily a function of beta, then fees should be low.¹ Low-beta long-short equity has a performance attribution more skewed to skill, as performance is a function of stock picking (which can be fairly sustainable) as opposed to market timing (which, we believe, is less sustainable).
- Macro is pretty high up on the investment skill scale (with which not everyone will agree with). However, macro managers do not capture directional risk premiums. If they are long an asset class outright it is because they expect the underlying asset class to appreciate in price in the short or medium term (and not because a buy-and-hold strategy yields a profit for the long-term and patient investor). Their value proposition is based on their belief that they can find catalysts that result in price moves earlier than the rest of the market place. It also somewhat relies on the notion that central bankers and governments are not purely incentivised by economic reasoning alone but also by political necessity and non-economic constraints. The performance is therefore attributed to timing (and managing total risk) and investment themes, as opposed to capturing the premium of the asset class that is obtainable through a buy-and-hold strategy. There is a small premium for the lack of liquidity, as investors cannot cash an investment in a fund as easily as an investment in a traditional asset class where there are derivatives available that allow fast liquidation.

Based on the assumptions made that underpin Table 4, Macro should be able to charge the highest fees. How does this compare to the real world?

points of assets under management, then the 30 basis points are actually 300 basis points on the 10% of the portfolio that is actively managed. Some investment professionals (vendors of index funds and hedge fund products) believe that for this reason, the 30 basis points is going to zero. If this notion has merit (apart from being extreme), our earlier stated belief, that the whole investment management industry is at a cross road, is strengthened.

¹ In UBS Warburg *Asymmetric returns* [2002c] we made the point that high-beta long-short (for example sector specialists) have a problem with their business model: if beta is high, the probability of a large drawdown is high. If there is a large drawdown in combination with a high water mark, the balance between taking risk and avoiding risk is potentially sub-optimal.

Some large and better known Macro managers have migrated to a multi-strategy approach (assuming there is such a thing as a single-strategy approach in the very heterogeneous sub-industry we today call Macro). For example 3+30 (3% management fee and 30% performance fee) is not unheard of. These larger Macro organisations are as or nearly as diversified as fund of hedge funds. These higher fees, therefore, could be justified. The Macro investor pays a similar amount of fees as the fund of funds investor. A fund of funds investor pays 1-2% management fee and 20-25% performance fee for the single managers, plus 1+10% on top of that for the fund of funds. This results in fees of 2-3% management fees plus 25-35% performance fees. However, while financial risk (as measured for example through volatility)¹ between a multi-strategy Macro manager and a fund of funds manager could be similar, non-systematic risk (ie, idiosyncratic risk) is probably lower with the fund of funds than it is with the Macro manager.²

Multi-strategy, fund of funds and indexed products are to some extent competing products

Table 5 and Table 6 show net fees as a function of the fee structure and gross return with and without a hurdle rate. For example: a 20% gross return with a total fee burden of 3+30%, with a 5% hurdle rate to the end investor, would result in a net return of approximately 12.5%. ($3 + .3 * (20-5)$)

Table 5: Net returns with 5% hurdle rate

Fee structure	Gross return (%)					
	0	5	10	15	20	30
1+20 (%)	-1.0	4.0	8.0	12.0	16.0	24.0
2+20	-2.0	3.0	7.0	11.0	15.0	23.0
3+20	-3.0	2.0	6.0	10.0	14.0	22.0
1+30	-1.0	4.0	7.5	11.0	14.5	21.5
2+30	-2.0	3.0	6.5	10.0	13.5	20.5
3+30	-3.0	2.0	5.5	9.0	12.5	19.5

Source: UBS Warburg

Table 6: Net returns with no hurdle rate

Fee structure	Gross return (%)					
	0	5	10	15	20	30
1+20 (%)	-1.0	3.0	7.0	11.0	15.0	23.0
2+20	-2.0	2.0	6.0	10.0	14.0	22.0
3+20	-3.0	1.0	5.0	9.0	13.0	21.0
1+30	-1.0	2.5	6.0	9.5	13.0	20.0
2+30	-2.0	1.5	5.0	8.5	12.0	19.0
3+30	-3.0	0.5	4.0	7.5	11.0	18.0

Source: UBS Warburg

¹ See for example Table 7 (page 34), Table 8 (page 35). We have updated historical performance in the Appendix of this document. Also compare volatility and maximal drawdowns in Table 11 (page 68) and Table 12 (page 69).

² This last notion is probably subject to debate as phrased too generally. Some multi-strategy Macro managers carry less idiosyncratic risk than some fund of funds. As we have pointed out in UBS Warburg "The Search of Alpha Continues" [2001], not all fund of funds are created equal.

Table 5 and Table 6 confirm what most investors already suspected: charging high fees is attractive for the fee recipient. This is one of the reasons why we believe that the traditional asset management industry will not just sit there and watch a small sub-industry capture an oversize portion of the fees the fee-paying investment community is willing to spend. The expansion of the traditional asset management industry into the absolute return world is already well underway.

High and stable fees are more attractive than small and falling fees (for the fee recipient, that is)

Asymmetric returns through derivatives

In our AIS (Alternative Investment Strategies) as well as derivatives research,¹ we argue that the normal distribution shown on the right hand side of Chart 4 (on page 23) is actually passively obtainable at low cost. There is no need to pay an active fee if the same gross result can be achieved at a lower cost through a passive approach. If the same gross return can be obtained at a lower cost, this means that the net return is higher.

Asymmetric returns can be achieved quite easily through the combination of a fixed-income element and options. The most simple structure is a zero-coupon bond plus a call option on an equity index. One of the main attractions of such strategies is that the maximal loss at expiry is known in advance. If the zero-coupon bond is structured in such a way, that it grows to 100% of the initial investment, then the maximal loss is zero, that is, capital is preserved (or guaranteed) at expiry (note that 'maximal loss' refers to directional market risk but not credit risk of the issuer or inflation risk). Over time, such structures will have an asymmetric return profile: in some years or periods the call option will end in-the-money and the investor will have his money back plus some capital gains from the long call option position. In other years or periods, the call option will end out-of-the-money, that is, the investor will only get his initial principal back but no proceeds from the call option (as it expired worthless).

Example

In the following example we contrast a long-only strategy (ie, symmetrical return distribution) with both a passive and some active strategies, where asymmetric returns are the main objective. (Table 7, page 34.) For the long-only strategy, we have chosen the S&P 500 Total Return Index. For the passive asymmetric return strategy, we have simulated a zero-coupon bond plus call structure. For the active asymmetric return strategy we have chosen four HFRI hedge funds indices, that is, fund of funds, macro, equity hedge (long/short managers with low beta), and equity market neutral. The bond plus call structure was of one-year maturity and involved an at-the-money call option on the S&P 500 Index. The participation rate, therefore, was determined by the risk-free rate, as well as the level of implied volatility for one-year at-the-money options at the beginning of every calendar year, and our estimates for dividends at the time. The observation period is from January 1994 to February 2003, and was determined by our database of SPX-implied volatility starting in 1994.

We must confess: our initial expectation was that hedge funds (which is active money management) do better than capital guaranteed products (which is passive if we assume that financial engineering carries no premium for investment skill). We were surprised by the results of the analysis.

Equal gross returns obtained at lower cost results in superior net performance

Options also allow investors asymmetric return profiles

¹ See for example UBS Warburg "The Search of Alpha Continues" [2001] or UBS Warburg "Managing the Curve" [2002d].

Table 7: Symmetric versus asymmetric return profile (1994-2003)

	Symmetric		Asymmetric			
	S&P 500 Total Return Index	Capital guaranteed structure	HFRI Fund of Funds Composite Index	HFRI Macro Index	HFRI Equity Hedge Index	HFRI Equity Market Neutral Index
CARR	8.6	8.4	7.3	10.4	14.6	9.1
Volatility	16.3	5.9	6.3	7.7	9.6	3.3
Sharpe ratio	0.24	0.63	0.40	0.73	1.02	1.29
Correlation	1.00	0.81	0.54	0.36	0.69	0.16
Max 1M drawdown	-14.5	-5.0	-7.5	-6.4	-7.6	-1.7
Max 12M drawdown	-26.6	-2.9	-6.6	-7.1	-8.3	0.1
Skew	-0.7	-0.1	-0.4	-0.1	0.2	0.1
Excess kurtosis	0.5	0.9	4.1	0.7	1.4	0.3

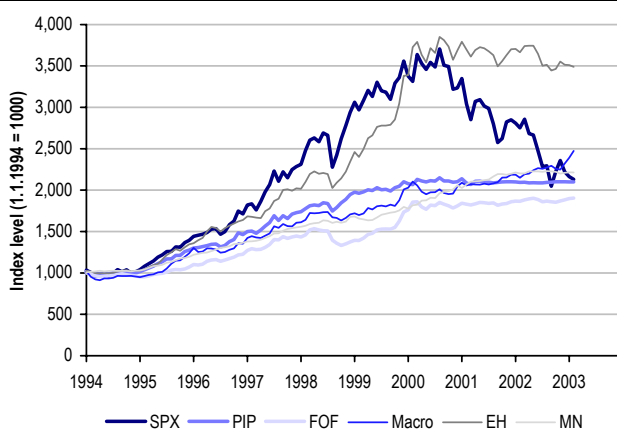
Source: UBS Warburg (based on data from Bloomberg and Datastream)
 CARR stands for compound annual rate of return. All returns in US\$. The zero-coupon bond (ZCB) is based on the 1-year US\$ LIBOR rate minus 20 basis points. Call option was priced at-the-money based on mid-market 1-year implied volatility plus 100 basis points and based on proprietary estimates for dividends. The HFRI indices are net of fees.

The capital guaranteed structure did well: equity-like returns with bond-like volatility. Although it is quite interesting to see which strategy did well over the chosen observation period, it is not that relevant for the discussion of fees and risk management. Chances are that going forward, the return figures are going to be either different or materially different from the ones above anyway.

And the winner is...

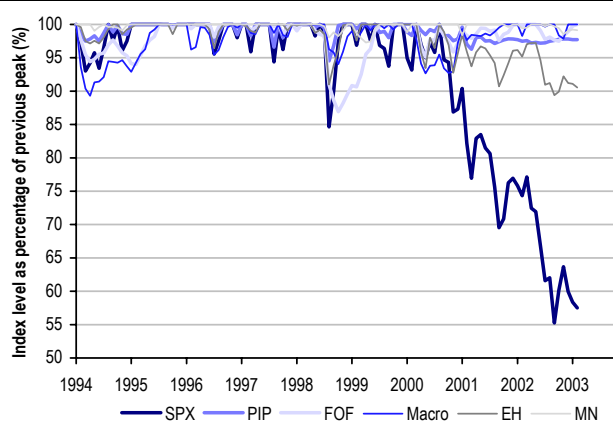
Chart 8 shows the cumulative performance of the six strategies, starting at 1,000 in January 1994. PIP stands for Protected Index Participation and is a UBS Warburg internal term for a zero-bond plus call structure without a performance cap (that could for example be achieved through a long position in a call spread instead of a call option). EH stands for Equity Hedge and MN for Market Neutral. Chart 9 shows the underwater perspective (index as a percentage of previous high) for the six strategies.

Chart 8: Cumulative performance



Source: UBS Warburg (based on data from Bloomberg and Datastream)

Chart 9: Underwater perspective



Source: UBS Warburg (based on data from Bloomberg and Datastream)

- Equity-hedge had equity-like (cumulative) returns during the bull market and was more or less flat in the aftermath of the bull market. Critics of the strategy argue that the strategy is unattractive because the correlation of long-short managers with the stock market is high. Chart 8 makes the point that this is literally only half the story.
- Chart 9 underlines our notion that if an investor associates financial risk with disutility from large capital drawdowns, absolute return vehicles and derivatives strategies can be conservative while long-only investing is an aggressive investment style by comparison. The notion that some investors experienced financial distress from absolute return managers is besides the point, because bankruptcy risk is idiosyncratic risk and an investor should not expect to get compensated for having concentrations of idiosyncratic risk in their portfolio.

Although the asymmetric properties of the five asymmetric strategies are clear from the two previous graphs (page 34), splitting the full time period in two time buckets makes it even more clear. Table 8 splits the full time period into two parts. Period 1 shows statistics from January 1994 to December 1998 (five year period), while period 2 shows the same statistics for the subsequent period from January 1999 to February 2003 (four years and two months). The figures for the two best strategies are highlighted in bold.

Table 8: Symmetric and asymmetric return profiles from 1994-1998 and 1999-2003

	S&P 500 Total Return Index	Capital guaranteed structure	HFRI Fund of Funds Composite Index	HFRI Macro Index	HFRI Equity Hedge Index	HFRI Equity Market Neutral Index
CARR (1: 1994-1998)	24.1	14.2	6.6	11.3	18.6	10.9
CARR (2: 1999-2.2003)	-8.4	1.5	7.8	9.1	8.7	6.8
Volatility (1)	14.0	6.9	6.6	8.5	8.1	3.0
Volatility (2)	17.7	3.7	6.1	6.8	11.2	3.7
Sharpe ratio (1)	1.34	1.29	0.18	0.70	1.63	1.86
Sharpe ratio (2)	-0.70	-0.68	0.62	0.75	0.42	0.77
Max 12M drawdown (1)	0.5	0.0	-6.0	-7.1	0.6	2.1
Max 12M drawdown (2)	-26.6	-2.9	-2.1	-2.4	-8.3	0.1

Source: UBS Warburg (based on Data from Bloomberg and Datastream)

Although we are strong believers in capital guaranteed structures, we were surprised to see how well the bond plus call structure compared with hedge fund indices.¹ (We were not at all surprised that it did outperform the long-only strategy on a risk-adjusted return basis, despite the fact that three thirds of the observation period was one of financial histories' greatest bull markets.) One reason why the capital guaranteed structure did well is because interest rates

Steel on its own does not move

¹ We had someone else calculate the time series independently to our own calculations to be sure we did not make some major mistake.

were high and implied volatility was low in the mid-1990s, resulting in these strategies having high equity participation and the principal guaranteed.¹ (Note that believers of risk management products, such as the capital guaranteed discussed here, believe that equity market exposure is like raw material that needs to be amended before inclusion in a portfolio. It's like with cars. There is a minimum degree of engineering required: Steel on its own does not move.²)

The Sharpe ratio of the capital guaranteed structure (0.63) is superior to the long-only strategy (0.24) when compared over the full 1994-2003 period (Table 7, page 34). However, the two Sharpe ratios over the two shorter periods are roughly the same (Table 8, page 35). This goes to show that relying too heavily on historical figures even if one agrees on the appropriate metric is tricky.

The main difference between the derivatives strategy and the four absolute return strategies is that the former had a negative Sharpe ratio in the second period (Table 8) while the four absolute return strategies had positive Sharpe ratios in all periods. The reason for this observation is that the bond-plus-call structure requires a bull market to achieve positive returns. The correlation coefficients in Table 7 (page 34) are an indication for the co-dependence of positive equity returns and the strategy's positive Sharpe ratio. The lower the correlation, the higher the probability achieving a positive and, at the same time, stable Sharpe ratio.

An interesting comparison is volatility between the long-only strategy and the capital-guaranteed strategy. Volatility in the first period was slightly lower than in the second with the long-only strategy. With the capital-guaranteed strategy, it is the other way round. Volatility in the 1999-February 2003 period was much lower. This is because the call option adds to volatility in a bull market but reduces volatility in the bear market (as the call option slowly decays and eventually becomes worthless). This is the beauty, we believe, about this structure: positive volatility in bull markets, capital preservation in bear markets (essentially the beauty of being long gamma: party when the heat is on but don't be the last to leave). The absolute return manager (as in for example fund of funds) tries to create this asymmetry through active management, whereas the capital guaranteed structure is more passive.³ Most institutional investors in the past had a dislike for both – hedge fund exposure as well as capital-guaranteed structures.

We previously noted that Macro is becoming more diversified by adopting a multi-strategy approach and, potentially, becoming a competitive force to fund of funds. The volatility of a diversified portfolio of Macro managers has become less volatile from period one to two (Table 8, page 35). While we would expect the dispersion of Macro managers to be much wider than the dispersion of fund of funds managers, one could argue that the extremely low correlation among

Relying in one risk metric is not reliable

Institutional investors in the past did not like asymmetric return profiles

Low correlation among Macro managers results in low volatility on a portfolio level

¹ Today it is the other way round, that is, interest rates are low and implied volatility high by comparison.

² It probably is pretty safe to assume that those private investors who have been in guaranteed structures during the bull as well as the bear market that followed, are likely to never do anything else again. The larger the disutility from capital losses, the more attractive these structures are.

³ Here passive is defined as the absence of some directional asset allocation process or investment skill (alpha). The investor pays a complexity premium for managing the risk over the life of the structure.

Macro managers results in diversified portfolios of Macro managers being not much more volatile than diversified portfolios of fund of funds. Low correlation among Macro managers results in low volatility on a portfolio level. The reasons for low correlation among managers is, we believe, due to the high manager flexibility, that is, the absence of a market benchmark, or any other idea the overall group could hug.

Those investors who do not invest in Macro do so in the belief that the expected return of the speculator is negative. If the investor's expected return is negative, then other factors such as correlation to the rest of the portfolio are irrelevant. Investing and speculation is often compared to gambling (see quote in the margin text). Those investors who shone directional strategies such as Macro and CTA will (apart from having a bias to short volatility strategies and therefore being stronger exposed to autumn 1998 type risk) compare the speculator with the slot machine user and relative-value managers with the slot machine owner. Those investors who are open to some (essentially anti-EMH) directional strategies will probably agree more with Larry Summers, who in 1985 compared financial economists with 'ketchup economists' obsessed with the relative prices of different-sized bottles of ketchup:

'... financial economists, like ketchupal economists ... are concerned with the interrelationships between the prices of different financial assets. They ignore what seems to many to be the more important question of what determines the overall level of asset prices'.¹

In the face of uncertainty, we recommend favouring an open and flexible approach to matters unknown or untestable, as opposed to a dogmatic and inflexible approach. This recommendation is built on our claim that risk management is as much a thought process (craft) as it is pure adherence to proven beliefs (science).

The main difference among symmetric and asymmetric return profiles is visible in the 12-month drawdowns² (Table 7, page 34 and Table 8, page 35.) The magnitude of drawdowns of all asymmetric return profiles is a fraction of outright exposure to equities. If investors experience exponentially increasing disutility from the magnitude of drawdowns (and the state of the pension fund industry in some countries and the European insurance sector suggests that this might be the case), the solution is asymmetric returns. (With 'solution' we mean long-term solution as opposed to short-term solution.) The absolute return approach results in asymmetric returns. The ultimate irony of all this is that in the halls of, for example, UK pension funds, derivatives as well as hedge funds are still perceived as of high risk.

Chart 10 shows the annual returns of the S&P 500 (symmetrical returns), the capital-guaranteed example, and the HFRI Fund of Funds Composite Index. The figure in brackets in the legend shows the compound annual rate of return for

'People think I'm a gambler. I've never gambled in my life. To me, a gambler is someone who plays slot machines. I prefer to own slot machines.'
Donald Trump

Combining those who seek relative value and those who seek mispriced value can result in reducing portfolio volatility

The absolute return approach is not indifferent as to whether the statistical outliers are on the left or on the right hand side of the return distribution

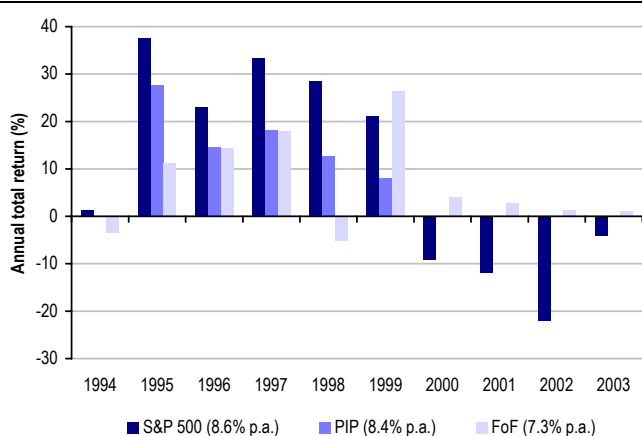
¹ From Campbell [2000]

² Drawdowns could be viewed as multiple standard deviation events on the left hand side of the return distribution in combination with serial correlation.

the whole observation period (Table 7, page 34). Chart 10 shows the relationship between interest rates and equity participation of the capital guaranteed structure. Chart 11 shows that the equity participation rate is primarily a function of interest rates at the beginning of every calendar year in the observation period (and, though to a lesser extent, implied volatility). If interest rates are high, there is more capital available to buy upside volatility, that is, equity participation through long option positions.

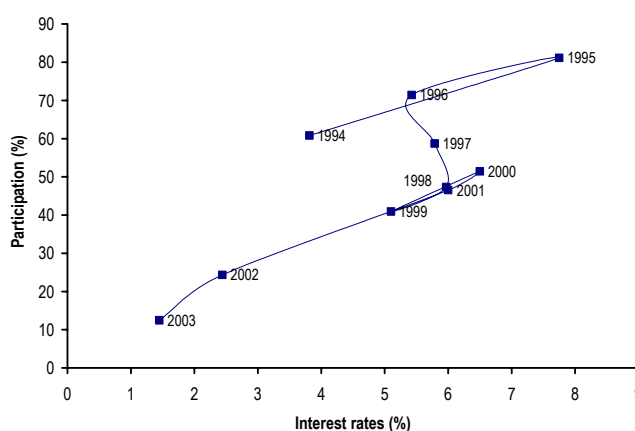
In the real world, the construction of capital-guaranteed structures changes with the level of interest rates and implied volatility. We have left this constant, to show a more passive approach to asymmetric returns and contrast it with the active approach to asymmetric returns (hedge funds).

Chart 10: Annual returns



Source: UBS Warburg (based on data from Bloomberg and Datastream)

Chart 11: Equity participation as a function of interest rates



Source: UBS Warburg (based on data from Datastream)
Based on one-year structure with 100% of principal guaranteed.

Chart 10 illustrates how the symmetric strategy, the passive (PIP) and active (FoF) strategies have performed (note that the PIP always underperformed the long-only strategy during the bull market)¹. Due to an unfortunate lack of market directional foresight, we do not know what these bars will look like over the next 10 years. What we do strongly suspect, though, is that asymmetric returns are superior to symmetric returns if disutility of large drawdowns is large. This could change the financial industry materially, because it means that financial products cannot (or it will be more difficult) be sold on the premise (and promise) that everything will be fine in the long term. The concept of asymmetric returns is based on the notion that interim volatility matters too.

An interesting observation, we believe, is that the ranking of volatility in Table 7 (page 34) is identical to the ranking of one-year 12-month drawdowns. Long-only was the most volatile, followed by equity hedge, Macro, fund of funds, capital guarantee structure, and equity market neutral. The reason why we find this interesting is the following: in financial markets there is the general belief

“In the long run we are all dead.”
John Maynard Keynes

How long does the long-term have to be for the notion that reward is related to risk to be true?

¹ Simulated with a 105% call (instead of at-the-money) and 95% guaranteed at year-end (instead of 100%) the structure outperforms long only in the three years from 1995 to 1997, as well as on a compound annual return basis and risk-adjusted return basis for the full simulation period. Volatility and one-month and 12-month drawdowns remained much lower than with an outright long buy-and-hold strategy.

that reward is somewhat related to risk in the long term. This must be true ex-ante. However, how long does the 'long term' have to be for the notion to be true on an ex-post basis? We will try and find some answers to this question on page 53, where we revisit the topic of return expectation by assessing risk from the perspective of the historian as well (as opposed to just the view of the financial economist).

Risk, returns and market efficiency

Why, we ask, is the financial industry in such a mess? By ‘mess’ we refer to the observation that many CIOs of insurance companies in Europe are currently doing an extended sabbatical, and the fact that many pension funds had their surplus wiped out within a brief period of time (relative to the time it took to build them). By ‘mess’ we also refer to the extreme dispersion of ideas and beliefs in the financial industry today. Or as Keynes put it: ‘The difficulty lies, not in the new ideas, but in escaping the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds.’

Here is an attempt to clarify or even explain the situation. It is without doubt, that Modern Portfolio Theory (MPT) had a great influence in how most market participants and observers think about risk. One of the pillars of Modern Portfolio Theory is the Efficient Market Hypothesis (EMH)¹ or its twin brother, the concept of security prices following a random walk similarly to molecules randomly colliding with one another as they move in space. In addition, the market cannot outperform itself. For a minority to constantly outperform, there is need for a great supply of losers.²

Given the high complexity of market dynamics and the reflexive relationship between cause and effect (feedback loops), it is pretty safe to assume that market forecasting is either impossible or very difficult in a persistent fashion. The number of investment professionals who point-forecast markets 12 months hence without giving a hint to the probability distribution around the forecast is probably decreasing (during the bear market, that is). The same concept of randomness is occasionally applied to successful managers. If markets are not predictable, any financial success must be a function of randomness. In other words, great investors were just lucky. Warren Buffett et al. are just the outliers on the right hand side of a distribution of investors starting out in the 1950s. It is an extreme form of survivorship bias where only the random winners are visible as the losers exit the game.

The leap from securities following a random walk to successful money management being a function of luck is potentially wrong. (Vendors of index funds will most certainly disagree.) We believe that the common denominator of successful money managers is not only luck but also entrepreneurial skill (high on the flexibility side, low on static guidelines) in general and risk management skill in particular (as adopting to change seems important for short-term as well

Investment wisdom is evolutionary - the financial industry's collective wisdom is therefore unlikely to be at its peak

The market cannot outperform itself, can it?

Fooled by randomness indeed

Successful money management is rather a function of the skill to manage risk as opposed to a function of luck

¹ Note that we do not believe that anyone seriously believes in the strong form of EMH. Perfectly efficient markets are an impossibility as demonstrated by Grossman [1976] and Grossman and Stiglitz [1980] more than 20 years ago. If markets were fully efficient, no one would bother to gather information, which in turn means market prices would not reflect all information. The debate is only whether the inefficiencies are large enough to reward those who try to exploit them.

² We do not subscribe to the view that markets are efficient just because a majority of ‘active’ managers underperform the benchmark. The view that markets are efficient because the market cannot outperform itself is, we believe, a misunderstanding derived from the ‘fallacy of composition.’ *Fallacy* is the general term for reasoning that can seem correct but is really unsound and confusing. The ‘fallacy of composition’ is reasoning that says: because one person in the crowd can do it, everyone in the crowd can do it. For example if fire breaks out in a cinema, one person can get out in 30 seconds. However, that does not mean all people can get out in 30 seconds. It is unreasonable, therefore, to believe that just because a minority of investors can outperform, all can outperform. Not everyone is equally fit.

as long-term financial health). Nearly all successful absolute return managers (Bernard Baruch, JP Morgan, Benjamin Graham, Warren Buffett, George Soros, Julian Robertson, Michael Steinhardt, Ed Thorpe, Jack Nash, Leon Levy, etc. – just to name a few) might or might not have had outperformed a broad index had they given a tracking error constraint of 200 basis points. What they have in common is a flexible (and absolute return) approach to investment management of which constantly assessing risk and adapting to change is elementary. This means that risk management is an important and integral part of the investment approach. Arguing that these gentlemen are a function of luck is like arguing that the success of Henry Ford, Sam Walton, John D. Rockefeller, Akio Morita, Thomas Edison, Andrew Carnegie, Walt Disney, Bill Gates, Michael Dell, Larry Ellison, etc. are also due only to luck. It is true that there are more people who failed with their enterprise than those who succeeded. But concluding from this asymmetry that aforementioned entrepreneurs are not better than those who failed but were just luckier is unlikely to be a wise conclusion. Entrepreneurial success is most likely a function of many variables of which the most important are probably (in random order) talent, intelligence, integrity, humility, hard work, diligence, drive (Lee Iacoccas' 'fire in the belly'), energy, passion, creativity, social network, adaptability (as in exposure to change), and, yes, some luck. (Capital also helps.) What is even more important is that all these variables can to some extent be assessed in advance – except luck.

Example

Given that the debate about whether markets are efficient or not is a very old one, is it relevant for the asset management industry today? Is it possible that there is no satisfactory answer as to whether for example equity markets are efficient or not and whether an active or a passive approach is called for? Indeed most market observers would argue that the U.S. stock market is one of the most efficient. However, one could also argue that the U.S. stock market is among the least efficient.

The NASDAQ is part of the U.S. stock market. The performance of the NASDAQ Composite index probably looks pretty similar to a composite index of tulip bulbs during the tulip bulb mania some 300 years ago. Hardly anyone would argue for market efficiency in the case of tulips in 17th century Holland.¹ However, the market dynamics were comparable. The US has the largest participation of retail investors in the stock market. This is pleasant for the brokerage community, but from a market dynamics point of view, it favours herding behaviour.² In addition, in the US, the percentage of indexed money (index funds and other passive forms of investing) is highest globally. This is amplified by the fact that financial consultants are more influential in the US (and in the U.K.) than elsewhere. Herding retail investors, indexed or quasi-indexed asset managers and consultants hugging the consensus results in market homogeneity. It is this market homogeneity that, one could argue, makes a market inefficient as it means that a large part of the market does the same thing

One cannot be certain about something one cannot test

Trading tulip bulbs at the NASDAQ

¹ The "greater fool theory" suggests that bubbles can exist even if all market participants are rational, that is, buyers buy on the premise that there is a greater fool around pushing prices even higher.

² One underlying assumption of this notion is that retail investors are less critical and therefore more receptive to what talking heads are selling on financial TV programs than are professional investment managers.

at the same time (as opposed to balancing fundamentals with risk).¹ Capital does not flow in projects or investments with the most favourable net present value because investors have other objectives than balancing potential return with an absolute measure for risk (for example buying Microsoft with new cash flow for tracking risk considerations). If there is no absolute yardstick to assess risk, the probability is higher that either all market participants either buy or sell (as for example was the case with NASDAQ). A trend becomes self-reinforcing. Expectations rise even further, amplified also through increased bullishness of various market participants (typical example of a feedback loop or Ponzi scheme). An asset bubble builds, and, eventually, pops (an asset price bubble is then naturally succeeded by a regulatory and lawsuit bubble). Hardly the result of an efficient market. Conclusion: small market inefficiencies can be arbitrated quickly as the arbitrage requires small amounts of capital. Extremely large market inefficiencies can exist and persist longer as it requires large amounts of capital to put on the arbitrage. Potentially, the arbitrageur runs out of capital long before proven right (as the 1995-2000 experience, sort of, demonstrates).

Introducing a flexible approach to managing money

The bottom line of this is that we, the financial industry, should perhaps stop worrying about whether markets are efficient or not. Potentially the debate has no answer, as the claim is not testable. We believe a subject worth debating is the flexibility of investment managers, that is, the hypothesised transition from the relative return approach to an absolute return approach. The absolute return approach is essentially, as highlighted above, a flexible approach to investment management. The absolute return approach is the merger of traditional asset management and risk management where risk is defined in absolute terms, that is, disutility from capital depreciation. The task of a long-short manager, for example, on the investment analysis side is pretty similar to the long-only manager, that is, bottom-up company research. However, the big difference is on the risk management side. If risk is defined as exposure to change, the long-short manager has a mandate to change the exposure of the portfolio (ie, the capital at risk) according to a change in his assessment of his market's environment (note that a reassessment of risk is not the same as market timing). The assessment of the change is obviously purely subjective (as opposed to objective or rule-based). This change could be due to a change in market conditions or a change in beliefs held by the manager – it does not really matter. What matters is that the manager manages money in a flexible fashion where an ever-changing environment and a reassessment of the situation are part of the equation. The incentive to act in a flexible and entrepreneurial fashion is further enhanced by the manager having his own net worth exposed to the same risks as his investors. (An enhancement that we believe is very important. If the hedge fund industry is going to change disadvantageously from here it is probably because of a change from the monies being managed by flexible entrepreneurs - who have their money where their mouth is - to less flexible administrators (who follow static rules and guidelines) responding to the call for transparency.)

The absolute return approach is essentially a flexible approach to investment management

¹ As argued elsewhere, market homogeneity also increases systemic risk as it reduces liquidity where liquidity is not defined by trading volume but by finding a buyer when one wants to sell.

IBM Chairman Louis V Gerstner Jr was quoted in the late 1990s as referring to the new internet companies as ‘fireflies before the storm.’ He called the storm that was arriving the real disturbance to the system, when companies transform themselves and seize the power of global computing and communications infrastructure (read: change). The dot-com companies he referred to as fireflies before the storm – ‘they shine now, but will eventually dim out.’ (Not unlike sell-side analysts, finding themselves in a sector currently en vogue.)

Fireflies before the storm

We could adopt this analogy for the asset management industry today. Hedge funds, potentially, are just the fireflies before of the storm. They certainly are shining now and, potentially, will dim out. However, the storm could be the US\$30+ trillion asset management industry transforming to the absolute return approach, that is, adopting the investment philosophy of the US\$0.6 trillion hedge fund industry. Economic logic suggests that successful approaches are copied.

Are hedge funds the fireflies before the storm?

Compare the following:

- (a) Typically a UK pension fund has an asset liability study done by their consulting actuaries every three years following on from the triennial valuation of the scheme.
- (b) A typical hedge fund observes geopolitics, social trends, and financial markets and assesses risk on a tick-to-tick basis.

Assuming risk is defined as exposure to change, which of the two do you believe is best suited to manage risk?

How does this relate to fees? One could argue that every fee-based business is somewhat like the massage business: you can do it yourself, but the result is not the same.

Living legends

AIMR (Association of Investment Management and Research) issued its inaugural issue of the *CFA Magazine* in January/February this year. The cover story was ‘Words from the Wise’ – a conference call from November 2002 that was chaired by Charles D. Ellis (author of *How to win the loser’s game?*). The ‘wise’ were John Neff, Gary Brinson, Peter Bernstein, Jack Bogle, Warren Buffett, Dean LeBaron, and Sir John Templeton. Together these legends share more than 300 years of collective experience.

300 years of collective wisdom

One of the questions was the following:

Looking back over the last 30 years, what are the most important changes in the fundamental nature of our profession? And then looking out over the next 30 years, what do you think will be remembered from today that’s really significant?¹

Here are some quotes from some of the participants. The quotes are in chronological order but are taken slightly out of context, as we did not reprint the whole debate. Our first quote is from Jack Bogle, founder and ex-chairman of the Vanguard Group:

This business has really changed. It used to be about stewardship, and now it’s about salesmanship. There used to be about 300 broad-based equity funds, and now there are 5,000, many of them narrowly based and speculative speciality funds, often created and sold just when they shouldn’t be bought. ...

Mr Bogle then pitches for investing in index funds and finishes response to the question:

... In all, the mutual fund industry has turned from a profession into a business. The challenge for the next 30 years is just as obvious as the smiles on our faces: This industry should return to its roots.

Back to the future

The adoption of the absolute return approach is, we believe, to some extent the industry ‘returning to its roots.’² There was an asset management industry before there were benchmarks and indexing. The first stage of the asset management industry’s evolution was an absolute return approach. The first stage of asset management was also a holistic approach with a low degree of specialisation. Individuals and institutions sought to generate returns by balancing stocks, bonds, and cash in a single portfolio. This approach was primarily implemented by the trust department of the neighbourhood bank. This paradigm suffered two great weaknesses: mediocre returns and lack of manager

The asset management industry started with an absolute return approach

¹ CFA Magazine, AIMR, Inaugural issue, January/February 2003.

² Benjamin Graham (1894-1976) on the difference between investment and speculation: “An investment operation is one which, upon thorough analysis promises safety of principal and an adequate return. Operations not meeting these requirements are speculative.” From Graham [1985], p. 1. This quote was originally from Graham’s classic “Security Analysis” first published in 1934.

accountability. These weaknesses were the seeds that enabled a whole new investment management industry to grow, and a shift to the second paradigm: the relative performance game.

With the relative return approach, clearly measurable passive market indexes provided the benchmark against which performance could be measured and investment managers held accountable. The second paradigm fits nicely with modern portfolio theory and seminal academic work on performance evaluation and risk measurement. With a final push from regulatory changes, the ERISA act of 1974 in the U.S. in particular, the second paradigm firmly established its roots in the United States and elsewhere.

Benchmarks were introduced by end investors, not managers

However, the introduction of clear and meaningful performance evaluation highlighted one of active management's greatest weaknesses: poor performance. 'Beating the benchmark' became the focus of a negative-sum game where only a small minority of managers can outperform the benchmark on a consistent basis. Arguably the introduction of a market benchmark can be blamed on further negative phenomena including the focus on asset growth (as opposed to performance), and the following of investment trends rather than the pursuit of contrarian strategies. Above all it can result in the deliberate seeking of 'the average mean' (i.e. mediocrity) as opposed to meritocracy, and a strong disincentive to use risk management techniques to preserve investors' wealth.

Benchmarks protect the investor, but not his portfolio

Mr. Bernstein (author of arguably the best book on risk *Against the Gods*) on the same question listed above:

One of the problems with this market has been, particularly for professional managers, 'benchmarkitis' on the part of the clients. I think there are forces at work that are going to break that down. One is the hedge fund, which you can approve or disapprove of as an animal, but it's focused peoples' attention away from the conventional benchmarks. This is a very, very important development.

Corporate governance and absolute returns

One question of the conference call with the legends was on corporate governance. Corporate governance could, we believe, be improved through implementation of the absolute return approach. The main decision for buying a stock under the relative return approach is balancing outperformance potential with its marginal contribution to tracking error. Most of the relative return managers portfolio is dead weight, that is, long positions held to manage tracking risk.¹ The main reason to buy a stock under the absolute return approach is balancing potential capital appreciation versus potential capital depreciation. One could argue that corporate executives will pay closer attention to investors who not only can buy or not buy the stock but also sell short the stock.

Corporate governance could improve by the asset management industry adopting an absolute return approach

Here are some soundbites on corporate governance from the legends. These quotes are taken out of context but are related to the subject of corporate

¹ We have discussed dead weight in UBS Warburg *In Search of Alpha* [2000]

governance in the investment management industry. Ellis phrases the question as if the U.S. president was calling the panellists on the subject of corporate governance. Some of the responses were:

LeBaron: *Sunshine, sunshine, sunshine, disclosure and more of it. And the president should start with it himself.*

Buffett: *The only real way to get improvement in corporate governance is to have big investors demand it.¹*

Bogle: *But most important is for institutions to wake up and behave like owners.*

Bernstein: *The president should understand that we run the risk of ending up with corporations run by bean counters instead of risk takers if we push this thing too far. Sunshine is essential. And the tax thing is an interesting idea, but otherwise try to keep the sticky fingers a little off.*

We believe that at least some of these quotes point towards an absolute return approach. Diverging interests between principal and agent have come a long way. Some of the current problems in the economy in general, and in the financial industry in particular, could be solved (or the status quo improved) by re-aligning interests between principal and agent. What safer way than principals requesting that agents become at least a little bit principals?² For this not to work, capitalism and free enterprise needs to be a flawed idea.

Incentivising agents to think, behave and act like principles

Stop press

As of 20 May 2003 and after a year-long investigation and two days of hearings on the hedge fund industry, SEC regulators have found no evidence hedge funds are marketing to average investors. On the contrary SEC members said the problem might be that ordinary investors cannot get access to these funds. One SEC commissioner said that rather than cracking down on hedge funds the SEC may need to consider loosening rules that govern mutual funds. Another SEC commissioner added, ‘We started out worrying about whether the investor was being protected from hedge funds. Now, we’re talking about whether the investor needs to get into hedge funds, or hedging.’ (From Wall Street Journal Interactive.) A paradigm shift indeed.

¹ Curiously the UK is taking the first brave steps by rejecting executive pay proposals at AGMs.

² Note that the introduction of market benchmarks was not the agent’s idea. Principals, potentially, have only themselves to blame.

Time diversification, risk and uncertainty

An interesting observation, we believe, is that the capital guaranteed structures discussed above are only considered applicable to private investors. The main notion against such structures for institutions is that equity outperforms bonds in the long-term and therefore there is no need for hedging. This, we believe, is a paradox. The reason it could be a paradox is because it is known that equities are more risky than bonds. If this is true, then why is it that having a large equity allocation is considered conservative in the long-term? The reason, we believe, has to do with the concept of time diversification, the definition of 'long-term' as well as the definition of risk.

There are essentially two camps. One school of thought is that time reduces risk, the other argues, that time increases risk. Conventional wisdom suggests that over long horizons above average return tend to offset below average returns. In addition, volatility decreases with time and the probability of (end-of period) loss also falls with time. However, if the magnitude of potential loss defines risk, then risk increases with time. The bottom line is, as Kritzman [2000] put it:

*The truth is that risk has no universal definition; rather like beauty, it is in the eyes of the beholder.*¹

If time reduces risk, then it is true that investors just need to invest in equities and everything will turn out to be ok, as long as the investment horizon is long-term (for example infinite). However, if this were true, then equities could not be more risky than bonds. If it were true that equities outperform bonds in the long-term, why bother investing in bonds in the first place? If equities outperform bonds in the long-term, interim volatility and drawdowns do not matter in the short and medium term. Reliance on this notion to some extent implies indifference to volatility during the investment period. In addition, if it were true that equities outperform bonds in the long-term, the pension fund industry would not be experiencing its current malaise. All participants (corporate sponsors, trustees, board members, advisors, government, pensioners, labourers, etc.) could just hang in there and wait until the 'long-term' materialises and asset growth catches up with liabilities. (Or wait until interest rates rise, and see the discounted value of the liabilities falling back into line with assets.)

In UBS Warburg's *Managing the Curve* [2002d], we argued for the second school of thought, namely that time does not reduce risk but time amplifies risk. Our line of argument was that true risk was perceived as large amounts of capital being wiped out, that is, occurrences on the left-hand side of the return distribution in combination with serial correlation (leading to large drawdowns). This is in addition to the fact that disutility from losses is not linear, that is, a 40% loss is more than twice as bad as a 20% loss (as recent forced selling by insurance companies shows).² The logic behind this point of view is that the

Does time increase or reduce risk?

The time diversification controversy depends on how we define risk

When 'hanging in there' stops to be a viable option

Disutility from losses increases with magnitude

¹ We recommend Kritzman [2000] for a good summary of the issues with respect to time diversification.

² The idea which underlines the notion of asymmetric disutility from losses as well as a reference point can be traced a couple of hundred years back (Switzerland's Bernoullis come to mind) but was formalised by Kahneman and Tversky [1979], who defined their utility function in terms of gains and losses (as opposed to asset position or

disutility (negative utility) from large losses is bad for all investors, that is, private as well as institutional investors. There are two important points to make:

1. There is no immediate solution to the debate whether time reduces risk or not as it depends on how we define risk. In other words, taking either side is speculative (the term speculative is here used as the opposite of conservative). If an investor believes in one argument, he takes risk, that is, he is exposed to his assumption being outright wrong or proven untrue over time (due to change in circumstances and market conditions for example).² This means that by taking a bet on something not known today or something unsolvable or untestable, is an extreme leap of faith. The risk is that the assumption proves untrue or changes without the investor spotting the change. This is, in our view, why many investors are in financial difficulty today. The dogmatic reliance on beliefs or assumptions is, we believe, the opposite of managing risk. Hugging the status quo might not be that good of an idea when circumstances change. Milton Friedman called the lack of manoeuvrability or unwillingness to adopt to change as the ‘tyranny of the status quo.’ A successful risk manager, we believe and assuming we are in the position to judge, has a probabilistic (as opposed to dogmatic) view on issues not known. In addition, the risk manager even questions ‘known’ facts. This is because knowledge in itself is uncertain by definition. This is true for the natural as well as social sciences.³ If this was not true, civilisation would not be evolving and knowledge, therefore, not expanding with time. Knowledge is only ‘true’ until someone comes along with a new theory that replaces the old.⁴ Knowledge, therefore, has to be treated as temporal from the start. That is why we believe physicists, theologians, as well as economists have one thing in common: they all fall back on their

**‘Everything is flux.’
Heraclitus¹**

**‘All we can do is to search for the falsity content of our best theory.’
Karl Popper**

wealth), loss aversion (as opposed to risk aversion), and their utility function is S-Shaped (as opposed to quadratic), that is, concave above the reference point, and convex below it.

¹ According to Greek philosopher Heraclitus (535-475 B.C.), there was no permanent reality except the reality of change; permanence was an illusion of the senses. Heraclitus was arguably one of the first (Western) philosophers. One of the last, Karl Popper (1902-94), popularised the notion that so-called scientific laws were not incorrigible truths about the world. (Most philosophers in between the two were in search of certainty.) Scientific laws were theories, and as such they were products of the human mind. For Popper, physical reality exists independently of the human mind, and so we can never apprehend it. We create theories to explain it, and use them for as long as they work. However, eventually each theory will prove inadequate, and we replace it with a better one.

² The notion that (high duration) equities are a perfect match for (high duration) liabilities was, at one stage, a good idea that was based on some strong beliefs and sound research. However, circumstances change. As Lord Keynes asked: “When circumstances change, I change my view. What do you do?”

³ We do not deny the existence of objective truth (because it would put us in argumentative difficulties) neither do we want to discuss Kant’s subjectivism in this report (because we have no edge in doing so). We just would like to make the point that the degree of confidence is seldom absolute and that the degree of confidence is subject to change. To prove for example that “all polar bears are white” (this analogy also works with swans) one literally needs to check out all polar bears. (In the case of polar bears and swans it does not matter if it is an albino or not.) If one just examines a small sample, the “fact” that all polar bears are white is not a fact but a belief where a certain degree of confidence can statistically be measured. If someone then spots a black “polar bear” walking down a glacier (sharing a similar genetic code as his white brethren), we then expand our knowledge by calling this “new” creature for example “glacier bear”. The “fact” that all polar bears are supposed to be white proves to be false as new discoveries and definitions replace the old.

⁴ Mr. Ptolemaeus also had a well thought out and “proven” theory underlying his point of view (until Mr. Copernicus and Mr. Kepler came along that is).

belief.^{1,2} Risk management is, in our opinion, the discipline that deals with the beliefs changing or being proven wrong to the disadvantage of the investors' financial health.

2. The notion that equities outperform bonds in the long-term is probably true but this is potentially irrelevant for most investors. The reliance on equities outperforming bonds in the long-term is only rational, we believe, in the very special case where capital is infinite. The problem is, though, that there is no such thing as indefinite capital in the real world.³ If there is uncertainty with respect to capital requirements before the end of history, the investor, in our view, cannot be indifferent to volatility. In other words, interim volatility matters. In addition, the hypothesis of equities outperforming bonds in the long term is only relevant for the scientist trying to test the hypothesis in a controlled laboratory experiment. The scientist is constrained to the scientific approach of the natural sciences as someone in the past thought it was a good idea to lean the methodologies of financial economics to the methodologies of the natural sciences (such as physics, astronomy, etc) as opposed to the social sciences (history, sociology, psychology, etc). The consequence of this (rather loosely phrased) remark is that relying on equities outperforming bonds in the long-term is risky – especially when long-term is not specified and the investor faces uncertainty with respect to needing the money before the long-term is reached.

Volatility matters

Because of our assertion that experience matters in assessing risk, we believe that more experienced managers potentially should do better. (Someone with an edge should do better than someone without.) However, experience in spotting change and assessing probabilities might be not enough. One could argue that the organisational set-up matters too. The more nimble and flexible, the better. There is enough anecdotal evidence of pension fund managers risking (or terminating) their career prospects on trying to introduce a contrarian strategy.⁴ Several administrative overlays are unlikely to be optimal when managing risk. If our hypothesis has merit, that is, the end investor outsources parts of the wealth preservation function, then the most skilled risk managers will be managing an increasing pool of capital in chunks of US\$100-1,000m blocks. This range seems to have proven as manageable before diminishing economics of scale kicks in. The most successful of this group can then go on and try to jump over the US\$1bn, US\$2bn, US\$5bn, and US\$10bn hurdles.

Experience matters too

How does all of the above relate to fees?

¹ This belief about beliefs we got from John Adams [2002], a professor of geography at the University College London and who has conducted research (among other things) on risk and road safety in the UK. His book "Risk" gives a fresh perspective on issues surrounding risk and uncertainty.

² The idea of beliefs being important in decision making under uncertainty is probably as old as Western philosophy. In economics for example, Kurz's [1994, 1997] theory of Rational Beliefs and Rational Belief Equilibrium challenges the theory of rational expectations and game theory that are based on the premise that economic agents know and understand a great deal about the structure of their environment. The theory of rational belief is based on the observation that intelligent economic agents hold diverse beliefs even when there is no difference in the information at their disposal.

³ Lord Keynes comes to mind again: "Financial markets can remain irrational far longer than you can remain solvent."

⁴ In this respect, the Boots case in the UK is exceptional since the idea generators kept their jobs.

It seems that successful risk management in an ever-changing environment is like shooting on a moving target: it is difficult and improves with practice. This means experience matters. Running an enterprise successfully over a long period of time requires a huge array and adaptable set of skills. Luck is likely to be only one of the factors driving entrepreneurial success. It is, in our view, unlikely that successful risk management will trade at a discount any time soon.

Shooting a sitting duck is easy

Conclusion: fireflies before the storm

There is still a lot of mythology with respect to hedge funds; much of it is built on anecdotal evidence, oversimplification, myopia, or simply a misrepresentation of facts. Although hedge funds are often branded as a separate asset class, a point can be made that hedge fund managers are simply asset managers utilising other strategies than those used by relative return long-only managers. The major difference between the two is the definition of their objectives: Hedge funds aim for absolute returns by balancing investment opportunities and risk of financial loss. Relative return managers, by contrast, define their return objective in relative terms. Benchmarked long-only managers aim to win what Charles Ellis [1993] calls a loser's game, that is, to beat the market.

Mr Ellis calls the pursuit of beating a benchmark a loser's game. In a winner's game, the outcome is determined by the winning actions of the winner. In a loser's game, the outcome is determined by the losing behaviour of the loser. Ellis makes reference to a book by Simon Ramo: *Extraordinary Tennis for the Ordinary Tennis Player* (New York: Crown Publishers, 1977). Dr Ramo observed that tennis was not one game, but two: one played by professionals and a very few gifted amateurs; the other played by all the rest of us. Professionals win points; the rest lose points. In expert tennis, the ultimate outcome is determined by the actions of the winner. In amateur tennis, the outcome is determined by unforced errors (i.e., the activities of the loser - who defeats himself or herself).

The future path of an economy or stock market is not predictable with any reasonable degree of confidence. Having a year-end target for the S&P 500 in January other than for entertainment purposes is similar to having a view on what the weather will be on Christmas Eve in June. Both systems (weather as well as the stock market) are extremely complex as the forecasting horizon expands.¹ The degree of confidence in the forecast decays exponentially with the increase in time. Decision-making with respect to the future will always involve uncertainty regardless of the approach used.² There will always be risk and uncertainty.

'A severe depression like that of 1920-21 is outside the range of probability.'
Harvard Economic Society, Weekly letter, November 16, 1929

¹ One could argue that stock market is more complex than the weather. In meteorology cause and effect are distinguishable and the forecaster does not influence the effect. This means a scientific approach makes sense. In a social system with agents being intelligent and capable of adaptation, cause and effect are sometimes reversed and the forecaster influences the effect through the fact that he influences expectations (which then changes the effect).

² Von Neumann and Morgenstern [1947] showed that rational investors make decisions by maximising expected utility on objectively known probabilities. Savage [1954] generalised the assumption of objectively known probabilities and pointed out that, even when it is impossible to construct an explicit probability distribution, people nonetheless manage to make decisions and resolve trade-offs. These decisions reveal the implicit probabilities they assign to potential outcomes. Whether these probabilities are "objective" and based on relative frequencies, or whether they

The preceding statement is not as fatuous as it may sound. It raises the question of what a money manager should focus on in the long term: expected return or risk. We advocate the latter. We believe one cannot manage expected return, but one can manage risk. Return is the by-product of taking risk. Banks today do not manage portfolios; they manage risk. Their long-term investment strategy is to define the risk they want to be exposed to and manage their exposure accordingly. This implies that banks have an absolute return focus as opposed to a relative return focus. Potentially, asset management could be in the process of moving in the direction of banks - and other absolute return managers such as what we today refer to as hedge funds (i.e., defining risk in absolute terms rather than relative terms). In other words, the asset management industry might be in the process from moving from the second to the third paradigm, as outlined in the introduction. One could also argue that the asset management industry is moving back to an absolute return orientation and that the passion with market benchmarks was only a brief blip in the industry's evolution. In other words, what we call hedge funds today could simply be the fireflies before the storm about to be sweeping over the asset management industry.

On an only partly unrelated note

We have quoted Karl Popper twice in this document. One of Karl Popper's main intellectual achievements was that a statement that no observation would falsify cannot be tested, and therefore cannot count as scientific, because everything that could possibly happen is compatible with its truth then nothing can be regarded as evidence for it. This notion stems from *The Logic of Scientific Discovery* first published in German in 1934 and in English in 1959. After Popper discovering this idea for the natural sciences, he realised that it also applied for the social sciences.

Karl Popper also popularised the term 'Open Society' in *The Open Society and Its Enemies* in 1945. Certainty, he argued, was no more available in politics than in science, and therefore the imposition of a single viewpoint is never justified. Popper's notion of The Open Society is based on some form of uncertainty: he states that we, a society, do not know how to make people happy (the upside). However, we can remove avoidable suffering and handicap (the downside).¹

This logic could be applicable for the investment profession: we cannot manage returns (the upside), as they are uncertain. However, we can manage risk (the downside).

Everyone agrees that the term 'hedge fund' is a misnomer. One could argue that 'absolute return strategy' is a misnomer too. Perhaps we should call it 'absolute risk strategy' as it is risk that is managed, not returns (however, we suspect that 'absolute return strategy' is better for marketing purposes and therefore assess the probability of the industry adoption our suggestion as rather slim.)

are "subjective" and based on individual beliefs, was shown to be irrelevant to the analysis of decision making. However, expected utility theory is probably best described as being "under review".

¹ Literary work by George Soros (arguably a Popper disciple) on Open Society and, Robert Shiller [1994, 2003] point in the same direction.

Return expectations revisited

‘There can be few fields of human endeavor in which history counts for so little as in the world of finance.’

John Kenneth Galbraith

In *20th Century Volatility*, December 1999, we discussed equity volatility in the 20th Century where we analysed UK stock market volatility since 1694 and US stock market volatility since 1800. One of the conclusions was that volatility at the end of the 1990s was more or less the norm in a long-term context. It was the below-average volatility of the mid-1990s that was the exception. We also examined volatility in UK consumer prices since the 13th Century. At the time we thought that covering 700 years of history was sufficient to claim having a long-term view. We were short-sighted, one could argue, as the history of civilisation goes back roughly 5,000 years. In our December 1999 report, therefore, we were only covering the medium-term (700 years) and the sort-term (100-300 years). We would like to rectify this and look at the long-term as well.

The long-term is defined as about 5,000 years

Above we defined risk as exposure to change. This definition holds pretty well the test of time. Table 9 below shows the largest cities over time. Faber [2002] uses the size of a city as a rough proxy for its prosperity.

Table 9: Cities that have been largest

City	Year	City	Year
Memphis	from 3100 BC	Cordoba	935 AD
Akkad	2240	Kaifeng	1013
Lagash	2075	Constantinople	1127
Ur	2030	Merv	1145
Thebes	1980	Constantinople	1153
Babylon	1770	Fez	1170
Avaris	1670	Hangzhou	1180
Memphis	1557	Cairo	1315
Thebes	1400	Hangzhou	1348
Nineveh	668	Nanjing	1358
Babylon	612 (first over 200,000)	Beijing	1425
Alexandria	320	Constantinople	1650
Patna	300	Beijing	1710
Chang'an	195	London	1825 (first over 5,000,000)
Rome	25	New York	1925 (first over 10,000,000)
Constantinople	340 AD	Tokyo	1965 (first over 20,000,000)
Ctesiphone	570		
Chang'an	637		
Baghdad	775 (first over 1,000,000)		

Source: Faber [2002] based on Chandler [1987]

Mr. Faber uses this table to make the point that things (as for example prosperity) change. The size of a city is somewhat related to its prosperity. Most cities in Table 9 flourished at the time when they were the largest city in the world (give and take 100-150 years). However, prosperity comes and goes. One needs either an extremely short memory or a complete lack of history to assume that matters do not change. As Jim Rogers (co-founder of the Quantum Fund and author of the Investment Biker) puts it:

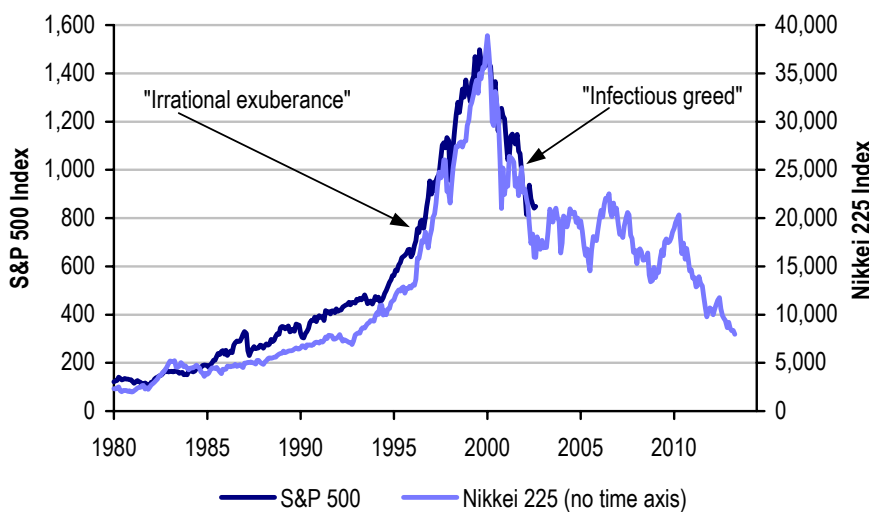
Prosperity comes and goes – as do ideas

‘The main thing about the investment world is, it is always changing and whatever today’s wisdom is, will not be next decade’s wisdom.’¹

Looking at Table 9: what are the chances of London, New York, and Tokyo remaining centres of prosperity forever? As we have pointed out in our December 1999 report, throughout history, rough periods (eg, war) are the rule, and quite periods (eg, peace) are the exception.

As we mentioned on page 5, most knowledge is temporary, and hence uncertain or, more precisely, subjected to change. We believe that there are many beliefs in the financial industry today. Two important ones are, first, that asset allocation explains around 90% of returns and second, that market timing does not work (as Chart 12 below clearly demonstrates).

Chart 12: S&P 500 Index versus leading Nikkei 225 Index



Source: UBS Warburg *Return Expectations* [2002e] p. 6 and Ineichen [2003a] p. 472
 The time axis refers to the S&P 500. The Nikkei 225 index has been brought forward so the peak in December 1989 matches the peak in the S&P 500 index which was in August 2000 based on month-end index levels.

We would like to challenge the first belief.² Asset allocation might or might not explain most of a portfolio managers’ performance. However, how relevant is this fact for an institution with an investment process with many administrative overlays? Some UK pension funds, for example, had their surpluses wiped out because their allocation to (historically overpriced) equities was 75% of total

Lack of absolute yardstick to measure and manage risk

¹ Bloomberg interview, 13 May 2003

² See Kritzman and Page [2002] for a recent challenge to the Brinson, Hood, and Beebower [1986] and Brinson, Singer, and Beebower [1991] claim that asset allocation policy accounts for more than 90% of return variation.

assets. Had these pension funds a large allocation to gold, timber, cash and hedge funds (ie, a different asset allocation), the surpluses would still be there – enhanced even. However, the general belief is (or until recently was) that commodities, cash and hedge funds do not belong into an institutional portfolio. Conventional wisdom was (or still is) ‘equities outperform bonds in the long-term’.¹ We believe that relying too heavily on (uncertain) beliefs is myopic and that one of the major issues the institutional asset management industry is facing today is the underestimation of the importance of an absolute yardstick to manage risk.

What happened to the long-term?

The paradigm of long-only equity investment is continuing its dissemination process. More and more investors are realising that being too long can be suboptimal. The belief that being long for the long-term and safe at the same time is being proven wrong if long-term is not defined properly and disutility is experienced from interim losses. Investors are not, we believe, indifferent to volatility (an absolute measure for risk). One could even go one step further and argue that an overweight in equities is a paradox: The reason equities outperform bonds is because they are more risky. However, if they are more risky, then the probability that they go in the wrong direction is higher. If that was not true, then equities would not be more risky. (We briefly discussed the time diversification controversy on page 47 of this report.)

The consensus view is that equities outperform bonds in the long term. Dimson, Marsh, and Staunton [2002], Fama and French [2002], and Ibbotson and Chen [2002] all put the expected equity-bond risk premium for the US stock market after adjusting for the positively upward biased sample period at around 4%. We do not have a counter-claim. The point made here is that we do not know how long long-term is and that disutility can be experienced from volatility before the long-term materialises.

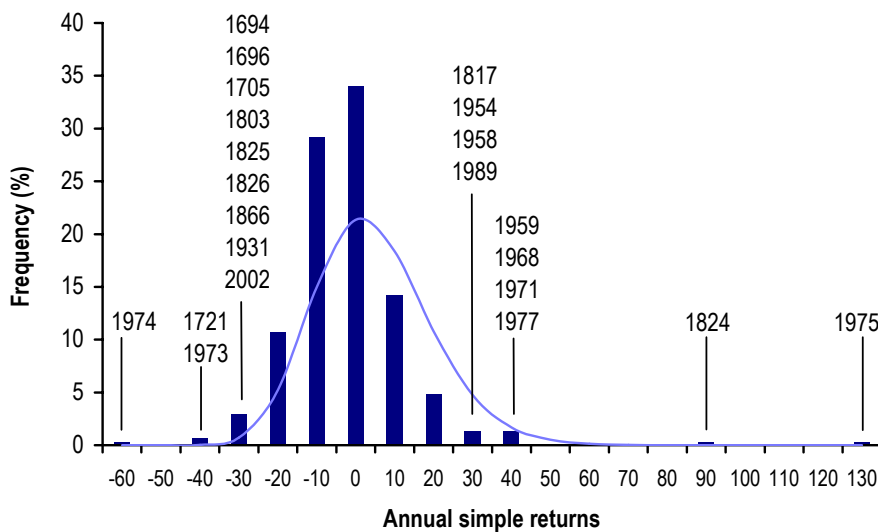
Chart 13 shows the frequency distribution of annual returns for the UK stock market from 1694 to 2002 in nominal terms. The distribution is log-normally shaped, as we show simple returns (as opposed to log returns).

‘Managing the curve’ is still a laudable concept

Equities outperform bonds in the long-term

¹ One could also argue that the true risk neutral position of a pension fund is a perfect duration match between assets and liabilities. This view, if it gained wide acceptance, would, in our view, also cause a paradigm shift as the obvious trade for pension funds would be to reduce equity allocation to zero.

Chart 13: Frequency distribution of annual UK stock market returns, 1694-2002



Source: UBS Warburg (based on data from Global Financial Data and Datastream)

- The 1970s contributed five outliers (irrespective of showing a distribution of nominal or real annual returns). This illustrates quite nicely the clustering properties of equity market volatility.
- There are some mean reversion patterns with respect to the outliers. The worst negative outlier (1974) was followed by the best (1975). The second best outlier (1824) was followed by market falls in the two subsequent years (1825-26).

A bet on mean reversion can be risky. Such a bet would have worked in 1974 but would have been disastrous in 1973. We believe a fair assessment of the current situation is that we do not know whether we are in a situation similar to 1973 or one similar to 1974. We never know.¹ Campbell and Shiller [2001] on mean reversion:

Assuming mean reversion is risky

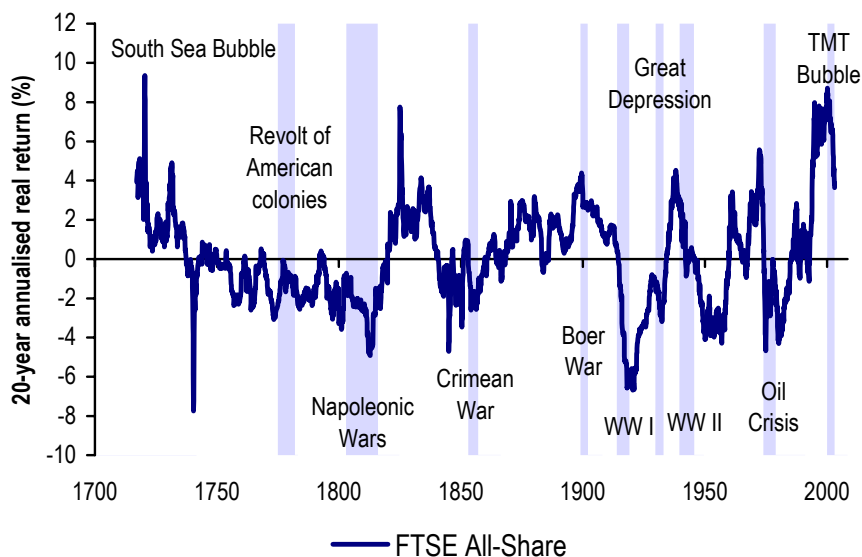
The very fact that ratios have moved so far outside their historical range poses a challenge however, both to the traditional view that stock prices reflect rational expectations of future cash flows, and to our view that they are substantially driven by mean reversion. Observers of either persuasion must face the fact that something extremely unusual has occurred. In this situation a broad judgement of our position in history, of the uniqueness of recent technological advances and investment patterns, and of the state of market psychology assumes more than usual importance in judging the outlook for the stock market. There is no purely statistical method to resolve finally whether the data indicate that we have entered a new era, invalidating old relations, or whether we are still in a regime where ratios will revert to old levels. In

¹ This should not imply that we should not try and predict stock markets other than for entertainment purposes. It's just that the forecast is not manageable and reliance upon can be futile. However, the distribution around the forecast is manageable.

our personal judgment, while we do not expect a complete return to traditional valuation levels, we still interpret the broad variety of evidence as suggesting a poor long-term outlook for the stock market.¹

By historical standards, the UK stock market has seen lower levels. Chart 14 below shows the rolling 20-year real return excluding dividends. The compound annual rate of real return for the whole time series from 1694 to January 2003 when dividends are excluded is around zero.

Chart 14: Rolling 20-year real returns of UK stock market



Source: UBS Warburg (based on data from Global Financial Data and Datastream)

Chart 14 is one of these ‘the-party-is-over’ graphs. We (the financial community) would all be better off if the party continued, that is, if equity markets went back to compounding at 20% per year. However, history suggests otherwise. The important message of Chart 14 is that there could be extended periods where value is destroyed. The annual 20-year real return is still positive, that is, 3.64% for the 20-year period ending on 31st March 2003. As Dimson, Marsh, and Staunton [2002] put it:

The most fundamental question of all is: Do investors realise that returns are likely to revert to more normal levels, or do current valuations embody exaggerated expectations based on imperfect understanding of history?

The worst annual 20-year returns were those following the South Sea Bubble. Some pension funds (primarily in continental Europe) just started to have meaningful allocation to long-only equity around the mid and late 1990s. This underlines two previously made notions: First, a flexible entrepreneurial approach (absolute yardstick for risk) is probably superior to a static administrative investment process when dealing with uncertainty, and second, investing and risk management is like musical chairs.

Do high equity valuations imply that ‘this time it’s different’ or are they based on an imperfect understanding of history?

Musical chairs is a game where you need to grab a chair when the music stops. You are left without a chair if you’re slow because there are more players than chairs.

¹ Campbell and Shiller [2001]

A more formal description of what we call the ‘musical chair effect’ is the distinction between a trend-following and a contrarian investment strategy. In terms of financial risk (as opposed to for example newspaper headline risk or career risk) a trend-following strategy has a high probability of failure, if one is the last to jump on the trend. (It is a good example, we believe, of the reflexive relationship between the expectations of the fundamentals or the expectations shaping the fundamentals.) In the UK, for example, we could be witnessing another practical example of the musical chair effect: In the mid-1990s, actuaries and consultants in the UK pushed equity weightings to above 75%. A working party of the actuaries profession is now about to present a report on the relationship between pension assets and liabilities.¹ The report will recommend the adoption of a liability benchmark portfolio (LBP), split between fixed interest and index-linked bonds. This means that actuaries recommended 75% equities around the peak of the equity market, and now that bonds have peaked (as interest rates are at their lowest for more than a generation), the recommendation will be a bond-heavy portfolio. We would not necessarily describe this as a contrarian approach to investment management.

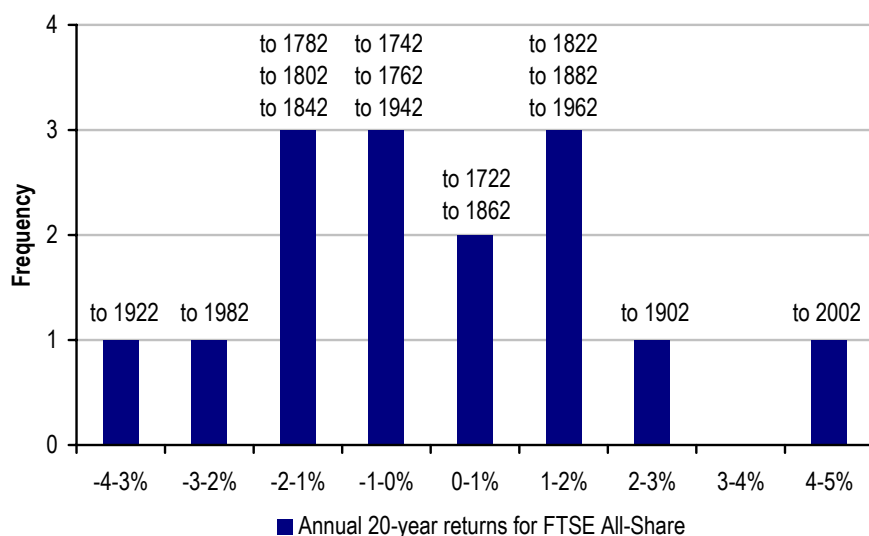
The ‘musical chair effect’ suggests that having good ideas too late can be disastrous

One purpose of the risk management function is to avoid disasters

Some of our assertions are based on our belief that a contrarian, dynamic, flexible and market-oriented approach to risk management is superior to a trend-following, static, administrative and dogmatic approach. This, of course, is a matter of perspective.

The following chart shows the same data as Chart 14 in a different format. Chart 15 shows a frequency distribution of annual 20-year real returns (compound annual return before dividends over a 20-year period adjusted for consumer price inflation) for the UK stock market. With this graph we try to show that equity markets can fall even over 20-year periods. Note that some market observers would consider a 20-year period the long term.

Chart 15: Frequency distribution of annual 20-year real returns for UK stock market



Source: UBS Warburg (based on data from Global Financial Data and Datastream)

¹ See "Question hangs over equities," Barry Riley, Financial News, 5-11 May 2003.

- The 20-year annual real return to 2002 can be considered an outlier by statisticians and non-statisticians alike.
- There seems to be some mean reversion patterns. The extreme outlier on the right (1983-2002 period) followed an outlier on the left (1963-1982). The extreme outlier on the left (1903-1922) followed an extreme outlier on the right (1883-1902). However, reliance on mean reversion can be tricky.
- What is the probability of the 2003-22 period to add an outlier on the right hand side of Chart 15 in twenty years from now? Based on actuarial assumptions of pension funds in the US and UK, it seems, the probability is perceived as very high. However, potentially actuarial assumptions are too high.¹

Table 10 shows an update of a (slightly amended) table previously shown in UBS Warburg's *Return expectations* [2002e]. The situation has not necessarily improved since last year. The first numeric column shows the loss from previous all-time high to 8 April 2003. The following column shows the time it could take to recover from this loss assuming the index compounds at 8% per year. All calculations are in local currency. (The same table in US dollar looks worse for most countries because of recent US dollar weakness.) The table was sorted in descending order. The indices are before dividends except the DAX.

¹ Actuaries of a UK pension fund with a 60+% allocation in equities have recently stated that they are assuming to deliver a "long-term return" of 7.13 per cent. Give the desire for transparency, we thought it was a shame that the estimate was only published with two decimals.

Table 10: Losses and potential recovery period

Country	Index	Loss (%)	Loss recovery (year)	Country	Index	Loss (%)	Loss recovery (year)
Thailand	Bangkok SET	-78.6	2023	Turkey	Istanbul SE National 100	-46.3	2011
Greece	FTSE/ASE 20	-76.2	2021	China	Shanghai SE B	-44.5	2010
Japan	Topix	-72.1	2019	Denmark	Copenhagen KFX	-44.0	2010
Finland	HEX General	-71.0	2019	UK	FTSE 100	-43.2	2010
Sweden	OMX	-67.9	2018	Indonesia	Jakarta SE Composite	-43.0	2010
Germany	Xetra DAX 30	-65.7	2017	US	S&P 500	-41.8	2010
Lebanon	Lebanon Blom	-63.9	2016	Philippine	Philippines SE All Share	-40.2	2009
Portugal	PSI 20	-62.5	2016	Brazil	Brazil Bovespa	-37.0	2009
Netherlands	AEX	-60.0	2015	Poland	Warsaw General	-36.7	2009
France	CAC 40	-57.8	2014	Israel	Tel Aviv 100	-35.8	2009
Egypt	Egypt Hermes General	-56.5	2014	Russia	Russian RTS	-34.1	2008
India	India BSE 200 Share	-53.2	2013	Argentina	Argentina Merval	-33.9	2008
Italy	MIB 30	-52.4	2012	New Zealand	NZSE Top 10	-33.9	2008
Norway	Oslo SE OBX	-52.2	2012	South Africa	FTSE/JSE All Share	-31.1	2008
Ireland	Ireland SE General	-51.9	2012	Austria	Austrian Traded	-30.2	2007
Hong Kong	Hang Seng	-51.9	2012	Peru	Lima SE General	-26.3	2007
Taiwan	Taiwan SE 100	-51.3	2012	Hungary	BUX	-22.9	2006
Malaysia	Kuala Lumpur Composite	-51.3	2012	Mexico	Mexico IPC (Bolsa)	-21.8	2006
Belgium	Bel 20	-50.5	2012	Venezuela	Venezuela SE General	-21.5	2006
Spain	IBEX 35	-49.5	2012	Chile	Chile General (IGPA)	-19.4	2006
Czech Rep.	Prague PX 50	-48.8	2011	Iceland	Iceland SE All-Share	-19.3	2006
Korea	Kospi	-48.4	2011	Croatia	Croatia Crobex	-14.6	2005
Singapore	Singapore All Share	-48.0	2011	Australia	S&P/ASX 100	-14.1	2005
Switzerland	SMI	-46.9	2011	Colombia	MSCI Colombia	-11.7	2004
Canada	S&P/TSX 60	-46.7	2011				

Source: UBS Warburg (based on data from Datastream)

We believe it is illustrations such as the one in Table 10 that underline the necessity for a paradigm shift with respect to risk management. The current situation in which the financial industry is in is unlikely to be just bear market phenomena. The problems, we believe, are structural in nature. The industry is potentially at a crossroad. In our view, the belief that returns are manageable has to be relaxed. Risk is manageable, but not returns. Returns from passive exposure to asset classes, such as equities and bonds, are given by the market. Returns are not forecastable as the returns are influenced by the forecast. Returns are not a pure function of fundamentals as the fundamentals are influenced by the expectations of the fundamentals, that is, cause and effect are not distinct as is the case in the natural sciences. Risk, on the other hand, can be assessed and managed.

There is no such thing as 'return management'

Markets will continue to fluctuate

The equity market will be either higher or lower in one, three, five, or twenty years from now. (The often quoted observation that the year-end close of the DJ Industrial Average in 1964 (874.13) was the same as 1981 (875.00) is a coincidence.) In the following we briefly discuss the bull case, the bear case and the objective case. It is probably a long time since the views of the bulls differed by so much to the views of the bears. It seems to us that the bears are much more bearish than the bulls are bullish. We conclude this section with the 'alternative case'.

The bull case

Most market forecasters were bullish in the beginning of 2000. Markets fell in 2000. In 2001, most market forecasters suggested that there is light at the end of the tunnel. As a matter of fact, that still summarises the bull case: there is light at the end of the tunnel. Notorious optimists always see the light at the end of the tunnel. However, it is unclear whether the light at the end of the tunnel marks the end of the tunnel or are the headlights of another train. The medicine of low interest rates, fiscal stimuli, and the passage of time will result in the economy and equity markets recovering, and compound at a positive rate again. This is a rather brief description of the bull case. However, since the asset management industry has a bias towards long-only equity, we assume the bull case is known.

The bear case

The bear case is less discussed in sell-side research but is regularly brought up by a minority of pundits and journalists as well as frivolous alarmists. The three most often described scenarios are a credit crunch, deflation, Keynes' liquidity trap or a combination thereof. The general belief of the bears is that Alan Greenspan was right in referring to the equity market as 'irrationally exuberant' in December 1996 but turned from a bull market critic to a bull market cheerleader in the aftermath of these remarks in December 1996. Most bears, we believe, weight the impact of debt (more precisely leveraged overinvestment) on the economy stronger than do the bulls. In addition, they believe that central bankers intervention in the monetary system has a positive short-term impact, with dire negative long-term side effects, as fighting market forces, they believe, works in the short-term but not in the long-term. Bears, generally speaking, do not ignore some of the claims of Austrian economics ('it's credit that matters, not money') whereas everyone else in the financial industry, by and large, does.

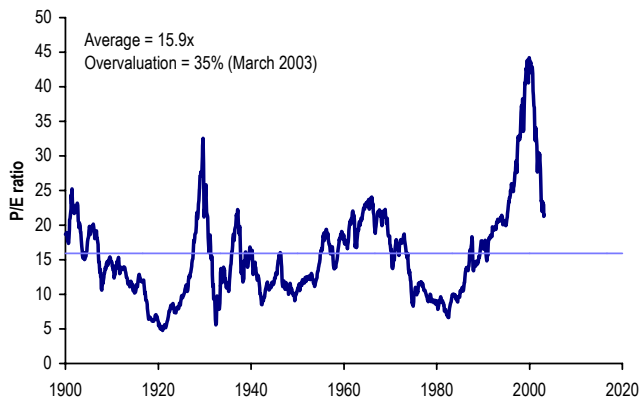
Chart 16 and Chart 17 below show two similar valuation methods for the US stock market from 1900 to the first quarter of 2003. As both methods have stock market prices in the numerator, the two graphs look alike. Chart 16 shows cyclically adjusted P/E for the S&P 500 index and is from Robert Shillers' *Irrational Exuberance* [2000] and Chart 17 shows Smithers and Wright' 'q' [2000]. 'q' refers Nobel Laureate James Tobin's 'q'. Smithers and Wright define 'q' (or 'equity q') as the ratio between the value of companies according to the stock market and their net worth measured at replacement cost. Tobin's q includes corporate debt.

Markets, most likely, will be different tomorrow than they are today

A notorious optimist is someone standing in quicksand but is not worried because he or she believes in mean reversion

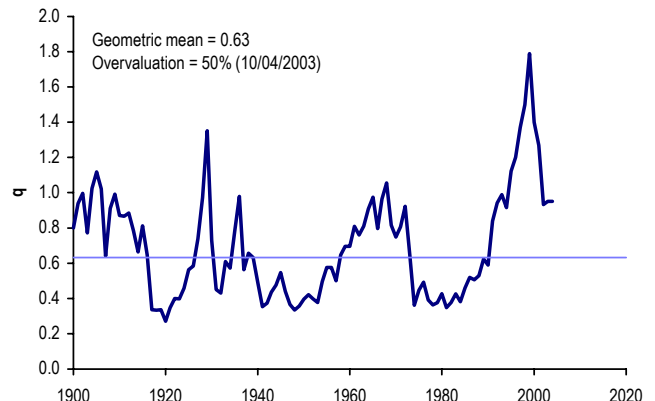
For the bears, overinvestment is a problem

Chart 16: Cyclically adjusted PE, 1900-2003



Source: Shiller [2000] Update from <http://aida.econ.yale.edu/~shiller/>

Chart 17: Equity q, 1900-2003



Source: Smithers and Wright [2000] Update from www.valuingwallstreet.com

At an S&P 500 level of around 880 at the end of March 2003, the US stock market was still valued above its long-term average based on these two metrics. Assume investors holding US stock decide that not its current valuation but a P/E of 10 times is more appropriate (which, historically as well as statistically, is a possibility) and assuming US\$50 is a reasonable estimate for the index constituents aggregate earnings per share including all adjustments for options and pension fund deficits, the S&P 500 could fall to 500. For an investor experiencing great disutility from an index level of 500, the notion that equities outperform bonds in the long-term is not that relevant. Interim volatility is largely influenced by valuation swings. These swings, we believe, are difficult or impossible to forecast. However, the risk is manageable.¹

Repricing is difficult or impossible to forecast

Late Leon Levy refers to the recent (until 2002) erosion of US\$7 trillion in market value as a Shakespearean drama with five acts, whereby we are now in the third:

My instincts, refined by fifty years of experience in finance, tell me that we are in but the third act of a five-act Shakespearean drama that portends a bad ending. Stock prices may have plummeted from their dizzying heights, but neither consumers nor investors have yet realized the perils of the suffocating pall of debt hanging over the financial world. Nor have they reckoned with the increasing difficulty of competing in a global market burdened with excess capacity and idled workers in almost every industry. Even at today's discounted prices, the markets have yet to digest that the massive tide of foreign money that

¹ We wonder: orthodox economics (we define "orthodox economics" as the science that is written in economics text books and is taught at universities) is in the process of loosening up to behavioural issues and crowd behaviour. (This remark is slightly unfair as a small minority of financial economists have been including behavioural issues in their work for decades.) Technical analysis seeks to find patterns of human behaviour in past market movements. In addition, it is safe to say that technical analysis is about as respected with "educated" investment professionals and market observers as is reading tea leaves. (Essentially viewed as about as valuable as behavioural finance or hedge fund investing a couple of years ago.) It will be interesting to see whether, in the coming years, technical analysis will enter the tool box of a majority of investors (as opposed to the status quo, where only a minority - the trading-oriented managers - use technical analysis). Potentially it could be used not as an attempt to predict market direction, but to assess directional risk of existing positions. It could (and this is a hypothesis) help defining exit strategies (as opposed to entry strategies).

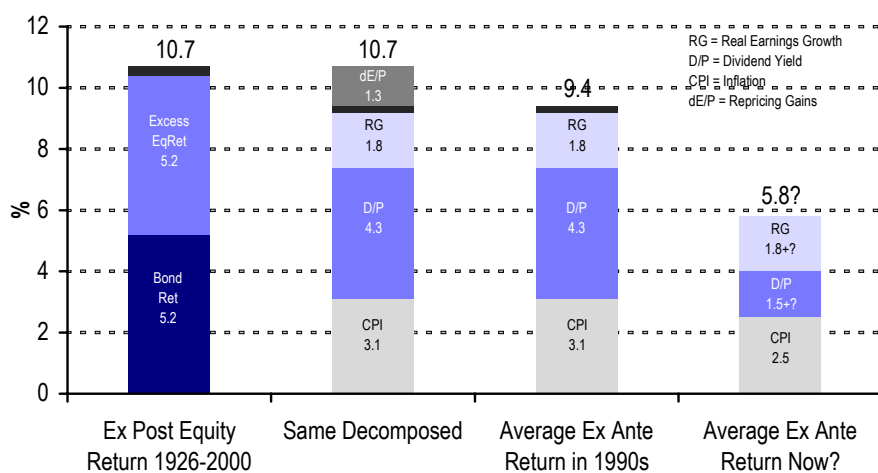
flowed into the markets in the past decade is ebbing and may begin to flow out, and consumers have only just begun to save more and spend less (a nearly inevitable result of harder times that will drive the last act of this drama).¹

The objective case

There is an objective case. The objective case is what a rational investor can expect of equities based on an estimate for bonds plus a premium for holding equities or a notional expected return based on inflation plus dividend and earnings growth. The aforementioned bull and bear cases are subjective. However, one could quite easily argue that there is no objective case as any case is based on the assumptions and beliefs of the observer assessing the situation.²

Ibbotson and Chen [2002] show an illustrative decomposition of equity market return components from 1926-2000 for the US stock market.

Chart 18: Decomposition of 1926-2000 equity market returns



Source: Ilmanen [2003] based on Ibbotson and Chen [2002]

Ibbotson and Chen decompose the realised 75-year average compound US stock market return of 10.7% into supply and demand. Demanded return is decomposed into 5.2% nominal Treasury bond return + 5.2% ex post equity risk premium + small interaction/reinvestment terms. Supplied return is decomposed in 3.1% inflation + 4.3% dividend yield + 1.8% real earnings growth rate + 1.3% repricing effect + small interaction/reinvestment terms. The third bar removes the unexpected pricing effect. The paper concludes that investors required an average nominal equity market return of 9.4% between 1926 and 2000.

Feasible long-term equity returns are a sum of dividend yield and a long-run earnings growth rate

¹ Levy [2002], p. 2

² As William A. Sherden, author of "Fortune Sellers," puts it: "Remember the First Law of Economics: For every economist, there is an equal and opposite economist - so for every bullish economist, there is a bearish one. The Second Law of Economics: They are both likely to be wrong."

We believe the most important word in the last sentence is ‘average’. The fourth bar in Chart 18 is an illustrative way of showing an expected average for the future. The figure derived from the model is the objective return expectation for the next 75 years (or whatever one defines as the long-term).¹ Any other estimate would be subjective at best or heretic at worst. However, how relevant is the estimate for the practitioner who needs to make financial decisions?

The probability distribution around an estimate is probably more important than the estimate itself

Potentially it is not that relevant, as it is perceived by a majority of investors. It is certainly a blessing if we know with a high degree of confidence that equities will outperform bonds by a couple of percentage points in the long run going forward. However, these long-run expectations are not manageable. If there is disutility from interim volatility, the objective long-term return expectation loses, we believe, its practical relevance for most or even all investors. We believe that the prolonged bull market has led to the asset management industry focusing on the forecast (which is not manageable) as opposed to the probability distribution around the forecast (which is manageable).

One cannot manage an expectation, but one can manage the potential disutility from the expectation being proven wrong

We do not claim the absence of the equity premium. Our point is that a risk manager facing uncertainty has to make financial decisions irrespective of differing views and school of thought. The debate about the equity premium continues to be a puzzle.² Mehra and Prescott [1985] initiated the equity premium puzzle nearly 20 years ago. Academics and practitioners alike have proposed various solutions to the equity premium puzzle (alternative utility functions, market imperfections etc.), but there is limited agreement on the topic. More recently, Mehra [2003] discusses the challenges the claim from 1985 battled over the years. The current debate is about the *expected* equity premium being different from the past premium. Mr. Mehra argues that before the equity premium is dismissed, researchers with opposing views need a plausible explanation why the future should be different from the past. In the absence of such an explanation, Mehra ends his recent article by making the following claim:

The equity premium puzzle remains to be a debate

Over the long term, the equity premium is likely to be similar to what it has been in the past and returns to investment in equity will continue to substantially dominate returns to investment in T-bills for investors with a long planning horizon.

¹ Two pre-Worldcom surveys of different U.S. experts (finance and economics professors by Welch [2000, 2001] and CFOs and treasurers by Graham and Harvey [2001]) resulted in long-run equity return expectations of 8-9% and stock-bond risk premium estimates of 3.5-4.5%. The equity return forecast in the CFO survey has stabilised at around 8.2% to 8.3% in 2002. A survey of global investors by Ilmanen [2003] from April 2002 comes up with the most cautious views on future equity market returns. The mean forecast for next decade average equity market return is 7.6% for the United States. Compared with bond yields of around 5.2%, these forecasts imply a stock-bond risk premium of 2.4%. From Ilmanen [2003]. This goes to show that the “objective case” is somewhat of a misnomer. A vast array of models, and differing views on model input variables such as growth rates and risk premiums, result in a wide range of solutions. Relying ones’ financial health on one of the outputs is, we believe, speculative and unlikely to be optimal for most investors.

² A good compilation of articles on the debate and links to further material can be found on <http://www.aimrpubs.org/ap/issues/v2002n1/toc.html>

Conclusion: the alternative case

Our challenge is not based on a counter claim. We challenge the practicability of ‘long term’ and ‘long planning horizon’. Today it should be clear that relying on ‘the long term’ story could result in an underestimation of volatility and its subsequent disutility with respect to financial objectives. Volatility was not perceived as much of a problem during the bull market – for plan sponsors, trustees, consultants, and private investors alike. However, the game has now changed. Most investors now have a different perspective than five years ago. Our observations surrounding the debate on the equity premium is not necessarily an economic counter-claim. However, we note that the term ‘long term’ is very vague. Potentially too vague for most investors to have practical application.

While there is uncertainty with respect to the expectation (model uncertainty as well as uncertainty with respect to the return components), we believe the greater contribution to ex-ante volatility is derived from changes in valuation, that is profits and losses from repricing. This volatility, we believe, is not forecastable with any degree of confidence or sustainability. (Although, as stated earlier, risk can be assessed in an historical context and managed accordingly.) We do not know whether valuations will fall through its long-term averages (the vertical line in Chart 16 and Chart 17 on page 62) over the next three years or not. If history is any guide we can assume that there is some probability that they do. (Unless, the claim ‘this time it’s different’ has merit.) However, what we do know with (by comparison) high degree of confidence is that price as well as valuations will fluctuate (read: change) for the foreseeable future. If there is disutility from losses, a long-only buy-and-hold strategy (where volatility is not managed either through an absolute return strategy or derivatives or other hedging techniques) might not be optimal.

Relying to heavily on the long term could result in an underestimation of risk as it exposes the portfolio to change

Risk management is the opposite of hugging the status quo

Investing in beliefs

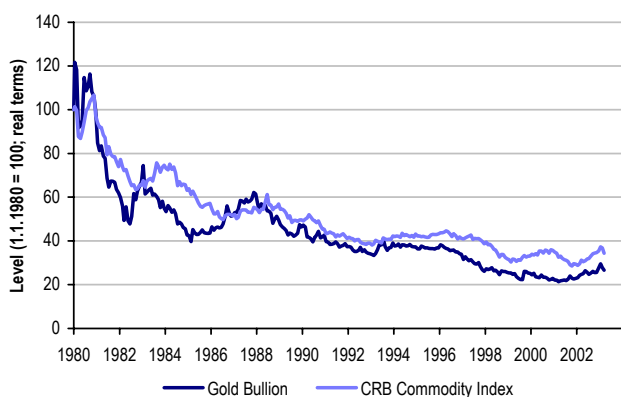
Three years ago the average allocation to hedge funds was around zero in institutionally managed portfolios. It is probably fair to assume that the average allocation of institutional money in commodities today is very close to zero. The reason is that the market has come to believe that commodities (either passive long-only or as managed futures) do not belong into an institutional portfolio. We believe the reason for this low allocation has as much to do with behavioural aspects (no one holds commodities) as with fundamentals (expected return for most commodities is zero).

Current paradigm (static 60:40 or 75:25 investment policy) suggests little or no exposure to commodities

Unlike developed equity markets, many commodities are trading at long-term lows. Chart 19 shows Gold and the CRB Commodity index in real terms and indexed to 100 as of 1980. The graph looks not entirely dissimilar to a graph showing real long-only equity returns in the run-up to the beginning of the 1982-2000 bull market. Chart 20 shows the trading range of a selection of commodities and commodity (price) indices. The trading range has been normalised between 0 and 100 for comparability. The thin vertical line shows the high and low between January 1980 and March 2003 in real terms (adjusted for US inflation). The bold vertical line shows the 90% range. The horizontal tick shows the level as of March 2003.

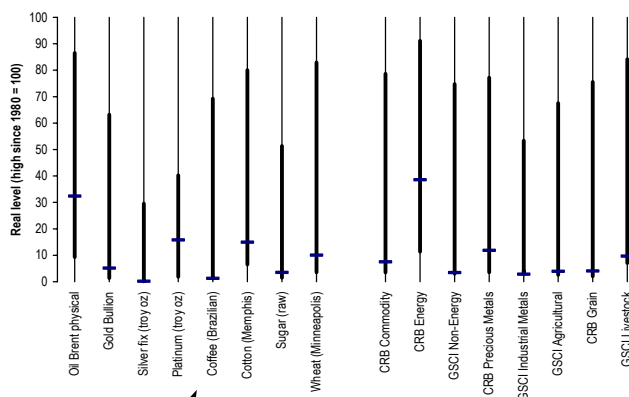
Commodities are cheap in an historical context

Chart 19: Commodities in 1980 US\$, 1980-2003



Source: UBS Warburg (data from Datastream)

Chart 20: Commodities and commodity indices, 1980-2003



Source: UBS Warburg (data from Datastream)

Note: GSCI indices are spot return indices. Oil since 1982, CRB Energy since 1983, CRB Precious Metals since 1986.

What if the Chinese, once affluent, start drinking coffee?

We do not have an edge in discussing commodity markets (yet). We therefore recommend Marc Faber's *Tomorrow's Gold* [2003] for anyone interested in the bull case for commodities. However, we ask: What if Gold or a basket of commodities compounds at 15-20% over a three or five year period? Chances are that the current (commodities-averse) consensus belief would change. Pioneers would have bought followed by early adopters. Once the trend is established (after three to five years) the consensus is likely to change slowly (as it did with long-only equity investments after the 1982 lows or hedge funds after 2000). Research starts to appear suggesting commodities for the long run. Old and forgotten or disrespected theories are revisited (in the case of commodities for example the notion that commodities do well in a rising wave of the

In search of gold

Kondratieff cycle). A continuous loop builds among private investors and financial intermediaries as the former demands a product while the latter increases supply and marketing effort as a result of spotting increase in demand (which then amplifies demand). Soon thereafter consultants start recommending commodities triggering and/or reinforcing lemming-like behaviour among private and institutional buyers alike. (Last in the long chain of events, a sell-side analyst writes *In Search of Gold – Investing in Commodities*)

Conclusion

The notion that asset allocation is important is pretty solid. Having a strategic target, therefore, has merit. However, having a strategic target biases the investment process towards a deterministic and/or dogmatic view of the world as it heavily relies on return expectations. We believe that the reliance on return expectations is admirable as it focuses on the long-term. However, it also exposes the portfolio to interim volatility and disutility thereof. In this report we tried to make the case that, when dealing with uncertainty, a probabilistic, dynamic and flexible approach is probably superior to a dogmatic, static and inflexible one.

A 'probabilistic approach' implies that there are no axioms in the social sciences (everything is uncertain) and that reliance on beliefs and dogmas might help administer large portfolios but also can be dangerous with respect to managing risk. It means that what we believe today is either true, false or currently a good idea but is subject to change. It means, putting it simply, we do not know what we do not know (as opposed to the dogmatic approach that assumes and relies upon 'we know'). A probabilistic approach suggests that one treats beliefs as beliefs and respects that the only constant is change. If we define risk as 'exposure to change' then risk management (as opposed to asset allocation) is the discipline that relies on little else than that the status quo will change. An asset allocator with a 75:25 equity-bond mix can become complacent with respect to risk during a bull market. The risk manager on the other hand is always aware that circumstances could change and expose the principal to excessive or undesirable risk. The condition for this being the case, we believe, is that there is an absolute yardstick for risk and a focus thereof.

By 'dynamic and flexible approach' we refer to the observation that absolute return managers try to protect the capital they were entrusted by their investors and are flexible to react to changes in the market environment. The absence of a proper wealth preservation incentive and lack of flexibility on the part of the manager under the relative return paradigm, results in the asset management function being rather administrative and static in nature as opposed to dynamic and flexible. Many layers of administration might protect the investor, but not his portfolio.

A dynamic and flexible approach is more risky than a static and administrative approach. However, the reason we feel strongly that the paradigm should change is that the increased risk from a flexible and entrepreneurial approach is primarily idiosyncratic in nature, that is, single manager risk can be nearly fully eliminated through diversification alone.

It is now for the fee-paying investor base to enforce change. (The fee-receiving part of the financial industry will supply whatever there is demand for.)

Closing remarks

The asset management industry (that is, the search for alpha) is most often considered as a zero-sum game (or a negative-sum game after fees). A zero-sum game implies the presence of both, winners and losers. If a paradigm shift results in all investors managing risk more aligned to their individual preferences, then all investors win. (Except those who miss the shift, of course.)

We believe that the purpose of risk management and risk management products is asymmetric returns. By asymmetric returns we mean a return profile that is not available in 'nature', but is artificially managed to meet the end investors' risk preferences more efficiently. Our belief is based on some assumptions of which an important one is that investors are loss averse, that is, volatility on the downside is not the same as volatility on the upside.

The asymmetric return profile is either achieved through absolute return managers driven by P&L or, more passively, through financial engineering using hedging techniques. We believe that what we call a hedge fund today is really part of the risk management business. Given that most investors expect this decade to be less investor-friendly than the last, we could currently be witnessing the merger between what we referred to as the asset management industry and what we have come to understand to be the risk management business. One could go on and view this as a merger between the long-term (as in 'equities outperform bonds in the long-term') and the short term (as in 'interim volatility matters'). The synthesis of the two would be, in its active form, managers seeking investment opportunities while managing total risk. In its more passive form, it would be structured investment products (either tailored or off-the-shelf).

We believe that one of the main sources of confusion, myth, and misrepresentation with respect to risk comes from the observation that risk is sometimes defined in relative terms and sometimes in absolute terms. During the 20-year bull market, the asset management industry used a more relative metric whereas the risk management industry (essentially trading and hedge funds) focused on an absolute metric to define and manage risk. Among the pivotal objectives of absolute return investing are, unlike with relative return investing, avoiding absolute financial losses, preservation of principal, as well as actively managing portfolio volatility. One of the major disadvantages of all this is that the absolute return approach does not fit as nicely into the traditional asset allocation process of the institutional end investor. One could conclude that the absolute return approach is not fit for survival because there is limited transparency and one cannot budget for risk as well as one can with the relative return approach. We believe that this view is similar to the assessment of individual transport one hundred years ago. Because of the lack of proper roads, there was the belief that 'the horse is here to stay'

**As with everything in business and life:
do the advantages (benefits) outweigh
the disadvantages (costs)?**

Appendix

Historical returns – an update

Table 11: Historical performance, January 1990 – April 2003

	Number of returns	Annual Return (%)	Volatility (%)	Sharpe Ratio (5%)	Highest 1M loss (%)	Negative months (%)	Worst 1Y return (%)	Correl. MSCI World	Correl. JPM Bonds
S&P 500 (Total return)	160	9.8	15.3	0.32	-14.5	38	-26.6	0.861	0.045
MSCI World (Total return)	160	4.8	15.1	<0	-13.3	42	-27.9	1.000	0.186
MSCI EAFE (Total return)	160	1.2	17.2	<0	-13.9	44	-28.3	0.937	0.278
MSCI Europe (Total return)	160	6.8	16.2	0.11	-13.2	41	-25.5	0.880	0.233
JPM Global Bond Index (Total return)	160	7.7	6.0	0.45	-3.3	39	-6.2	0.186	1.000
HFRI Convertible Arbitrage Index	160	11.9	3.4	2.04	-3.2	13	-3.8	0.290	-0.020
HFRI Distressed Securities Index	160	14.6	6.3	1.52	-8.5	21	-6.4	0.347	-0.146
HFRI Emerging Markets (Total) Index	160	13.6	15.7	0.54	-21.0	34	-42.5	0.615	-0.086
HFRI Emerging Markets: Asia Index	160	8.0	13.8	0.22	-12.1	41	-30.8	0.581	-0.014
HFRI Emerging Markets: Eur/CIS Index	108	18.7	33.8	0.41	-38.6	40	-69.5	0.408	-0.227
HFRI Emerging Markets: Global Index	136	13.9	16.2	0.55	-27.5	36	-44.4	0.510	-0.220
HFRI Emerging Markets: Latin Am Index	147	18.4	21.2	0.63	-15.6	37	-28.5	0.523	-0.058
HFRI Equity Hedge Index	160	17.8	9.1	1.40	-7.7	29	-8.3	0.615	-0.016
HFRI Equity Non-Hedge Index	160	15.2	14.8	0.69	-13.3	37	-21.7	0.724	-0.026
HFRI Equity Market Neutral Index	160	10.1	3.2	1.56	-1.7	17	-0.1	0.098	0.124
HFRI Event-Driven Index	160	14.3	6.8	1.37	-8.9	19	-4.8	0.580	-0.095
HFRI Fixed Income (Total) Index	160	11.0	3.6	1.67	-3.3	13	-3.1	0.431	-0.045
HFRI Fixed Income: Arbitrage Index	160	8.6	4.6	0.79	-6.5	19	-10.4	-0.012	-0.240
HFRI Fixed Income: Convertible Bonds Index	123	9.9	13.4	0.36	-11.5	37	-22.7	0.724	-0.165
HFRI Fixed Income: Diversified Index	100	8.7	3.8	0.97	-1.6	25	-1.1	0.009	0.283
HFRI Fixed Income: High Yield Index	160	9.2	6.7	0.62	-7.2	25	-12.1	0.391	-0.041
HFRI Fixed Income: Mortgage-Backed Index	123	10.3	4.9	1.08	-9.2	11	-9.8	0.021	-0.124
HFRI Macro Index	160	16.6	8.6	1.34	-6.4	31	-7.1	0.391	0.102
HFRI Market Timing Index	160	12.9	6.8	1.16	-3.3	36	-5.4	0.654	0.021
HFRI Merger Arbitrage Index	160	11.0	4.5	1.33	-6.5	14	-2.7	0.409	-0.009
HFRI Regulation D Index	88	16.2	7.6	1.47	-4.0	27	-11.2	0.152	-0.228
HFRI Relative Value Arbitrage Index	160	13.0	3.7	2.14	-5.8	12	1.1	0.345	-0.102
HFRI Sector (Total)	160	19.1	14.1	1.00	-13.0	29	-24.7	0.561	-0.027
HFRI Sector: Energy Index	100	23.5	20.5	0.90	-11.8	38	-37.1	0.344	0.102
HFRI Sector: Financial Index	136	20.0	12.4	1.21	-18.7	26	-17.7	0.476	-0.078
HFRI Sector: Health Care/Biotechnology Index	124	16.6	22.9	0.51	-17.7	42	-21.6	0.335	-0.097
HFRI Sector: Miscellaneous	148	16.5	10.4	1.10	-7.6	32	-12.6	0.218	0.028
HFRI Sector: Real Estate Index	112	11.0	6.5	0.93	-2.5	37	-0.8	0.153	-0.005
HFRI Sector: Technology Index	148	19.1	20.1	0.70	-15.2	41	-37.6	0.612	-0.056
HFRI Short Selling Index	160	3.4	22.5	<0	-21.2	48	-38.0	-0.654	0.012
HFRI Statistical Arbitrage Index	160	9.4	4.0	1.10	-2.7	25	-3.4	0.493	0.106

Source: UBS Warburg (data from Datastream and Bloomberg)

Table 12: HFRI fund of funds indices, January 1990 – April 2003

	Number Of Returns	Annual return (%)	Volatility (%)	Sharpe Ratio (5%)	Highest 1M loss (%)	Negative months (%)	Worst 1Y return (%)	Correl. MSCI World	Correl. JPM Bonds
HFRI Fund Weighted Composite Index	160	14.3	7.2	1.30	-8.7	28	-6.4	0.671	-0.057
HFRI Fund of Funds: Composite Index	160	10.3	5.8	0.90	-7.5	26	-6.6	0.422	-0.098
HFRI Fund of Funds: Conservative Index	160	9.0	3.4	1.21	-3.9	16	-1.6	0.438	-0.052
HFRI Fund of Funds: Diversified Index	160	9.3	6.3	0.68	-7.8	28	-8.7	0.423	-0.095
HFRI Fund of Funds: Market Defensive Index	160	10.4	6.0	0.90	-5.4	29	-7.1	0.003	0.031
HFRI Fund of Funds: Strategic Index	160	13.4	9.5	0.88	-12.1	31	-13.2	0.451	-0.085

Source: UBS Warburg (data from Datastream and Bloomberg)

Table 13: CSFB/Tremont indices, January 1994 – April 2003

	Number of returns	Annual return (%)	Volatility (%)	Sharpe ratio (5%)	Highest 1M loss (%)	Negative months (%)	Worst 1Y return (%)	Correl. MSCI World	Correl. JPM Bonds
S&P 500 (Total return)	112	9.1	16.2	0.25	-14.5	38	-26.6	0.942	-0.055
MSCI World (Total return)	112	4.5	14.9	-0.03	-13.3	41	-27.9	1.000	0.016
MSCI EAFE (Total return)	112	0.7	15.3	-0.28	-12.4	44	-28.3	0.937	0.111
MSCI Europe (Total return)	112	5.7	16.2	0.05	-13.2	39	-25.5	0.896	0.079
JPM Global Bond Index (Total return)	112	6.3	6.0	0.21	-3.3	42	-6.2	0.016	1.000
CSFB/Tremont Hedge Fund Index	112	10.7	8.7	0.66	-7.5	31	-7.3	0.465	-0.132
CSFB/Tremont Convertible Arbitrage	112	10.6	4.9	1.16	-4.7	17	-9.0	0.106	-0.182
CSFB/Tremont Dedicated Short Bias	112	-0.3	17.9	<0	-8.7	52	-28.0	-0.746	0.086
CSFB/Tremont Emerging Markets	112	5.4	18.5	0.02	-23.0	44	-44.2	0.523	-0.251
CSFB/Tremont Equity Market Neutral	112	10.8	3.1	1.86	-1.1	17	-2.0	0.378	0.022
CSFB/Tremont Event Driven	112	10.8	6.4	0.92	-11.8	21	-7.2	0.578	-0.184
CSFB/Tremont Fixed Income Arbitrage	112	6.9	4.1	0.46	-7.0	19	-10.1	0.028	-0.156
CSFB/Tremont Global Macro	112	14.2	12.4	0.74	-11.6	30	-22.2	0.185	-0.145
CSFB/Tremont Long / Short Equity	112	11.5	11.2	0.58	-11.4	36	-11.4	0.605	0.010
CSFB/Tremont Managed Futures	112	6.9	12.2	0.16	-9.4	45	-15.4	-0.211	0.351

Source: UBS Warburg (data from Datastream and Bloomberg)

Table 14: Annual calendar returns (1990-April 2003) for a selection of strategies

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MSCI World Index	-16.5	19.0	-4.7	23.1	5.6	21.3	14.0	16.2	24.8	25.3	-12.9	-16.5	-19.5	3.5
JPM Global Bond Index	11.8	15.5	4.5	12.3	1.3	19.5	4.3	1.4	15.1	-5.1	2.3	-0.9	20.1	4.6
60:40 equity-bond mix*	-5.2	17.6	-1.0	18.8	3.9	20.6	10.1	10.3	20.9	13.2	-6.8	-10.3	-3.7	4.0
HFRI Convertible Arbitrage Index	2.2	17.6	16.3	15.2	-3.7	19.9	14.6	12.7	7.8	14.4	14.5	13.4	9.4	6.0
HFRI Distressed Securities Index	6.4	35.7	25.2	32.5	3.8	19.7	20.8	15.4	-4.2	16.9	2.8	13.3	5.5	7.3
HFRI Emerging Markets (Total) Index	-3.4	45.4	24.4	79.2	3.4	0.7	27.1	16.6	-33.0	55.9	-10.7	10.4	3.2	6.2
HFRI Equity Hedge Index	14.4	40.1	21.3	27.9	2.6	31.0	21.8	23.4	16.0	44.2	9.1	0.4	-5.0	1.4
HFRI Equity Market Neutral Index	15.5	15.6	8.7	11.1	2.7	16.3	14.2	13.6	8.3	7.1	14.6	6.7	0.7	0.6
HFRI Equity Non-Hedge Index	-7.2	57.1	22.8	27.4	5.1	34.8	25.5	17.6	9.8	41.8	-9.0	1.4	-8.9	6.0
HFRI Event-Driven Index	-0.5	27.4	19.5	28.2	6.0	25.1	24.8	21.2	1.7	24.3	6.7	12.2	-4.3	5.6
HFRI Fixed Income: Arbitrage Index	10.8	12.9	22.1	16.6	11.9	6.1	11.9	7.0	-9.9	7.4	4.8	4.8	9.5	2.3
HFRI Macro Index	12.6	46.7	27.2	53.3	-4.3	29.3	9.3	18.8	6.2	17.6	2.0	6.9	6.2	3.2
HFRI Market Timing Index	13.5	23.1	7.7	24.2	3.5	12.6	13.5	13.6	24.8	26.2	11.8	4.1	-2.9	0.7
HFRI Merger Arbitrage Index	0.4	17.9	7.9	20.2	8.9	17.9	16.6	16.4	7.2	14.3	18.0	2.8	-0.8	1.4
HFRI Relative Value Arbitrage Index	13.4	14.1	22.3	27.1	4.0	15.7	14.5	15.9	2.8	14.7	13.4	8.9	5.5	3.6
HFRI Short Selling Index	36.2	-17.0	10.0	-7.5	18.5	-17.1	-4.0	3.9	-0.5	-24.4	34.6	9.0	29.6	-3.0
HFRI Statistical Arbitrage Index	11.2	17.8	10.8	12.6	4.7	14.2	19.6	19.4	10.1	-0.2	8.9	1.6	-3.4	1.2
HFRI Fund Weighted Composite Index	5.8	32.2	21.2	30.9	4.1	21.5	21.1	16.8	2.6	31.3	5.0	4.6	-1.6	3.3
HFRI Fund of Funds: Composite Index	17.5	14.5	12.3	26.3	-3.5	11.1	14.4	18.0	-5.1	26.5	4.1	2.8	1.3	2.4
HFRI Fund of Funds: Conservative Index	14.2	11.8	7.3	16.3	-1.2	13.1	13.7	15.0	-1.6	18.9	5.8	3.1	3.6	3.2
HFRI Fund of Funds: Diversified Index	17.0	13.8	10.3	25.4	-3.1	7.8	12.8	13.7	-5.5	28.5	2.5	2.8	1.1	2.2
HFRI Fund of Funds: Market Defensive Index	26.3	8.4	2.6	19.0	1.3	9.9	16.8	16.1	-4.1	13.8	15.4	7.3	7.5	2.7
HFRI Fund of Funds: Strategic Index	33.0	23.7	25.2	37.3	-7.6	16.9	16.1	22.8	-9.8	38.5	-0.6	1.2	-4.1	1.7

Source: UBS Warburg (data from Datastream and Bloomberg)

* assuming annual rebalancing at year-end

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UBS rating	Definition	UBS rating	Definition	Rating category ¹	Coverage ²	IB services ³
Buy 1	Excess return potential > 15%, smaller range around price target	Buy 2	Excess return potential > 15%, larger range around price target	Buy	47%	35%
Neutral 1	Excess return potential between -15% and 15%, smaller range around price target	Neutral 2	Excess return potential between -15% and 15%, larger range around price target	Hold/Neutral	47%	32%
Reduce 1	Excess return potential < -15%, smaller range around price target	Reduce 2	Excess return potential < -15%, larger range around price target	Sell	6%	26%

Excess return: Target price / current price - 1 + gross dividend yield - 12-month interest rate. The 12-month interest rate used is that of the company's country of incorporation, in the same currency as the predicted return.

1: UBS Buy 1/Buy 2 = Buy; UBS Neutral 1/Neutral 2 = Hold/Neutral; UBS Reduce 1/Reduce 2 = Sell.

2: Percentage of companies under coverage globally within this rating category.

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