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Asymmetric Returns and Sector Specialists

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Abstract

Returns from long-only exposure to equity and bond markets are fairly symmetrical. However, investors prefer asymmetrical returns over symmetrical returns as they prefer gains over losses and are averse to large drawdowns. Symmetric returns can be achieved through passive investment vehicles whereas asymmetrical returns require active risk management whereby risk is defined in absolute terms. This paper examines asymmetric returns of long/short hedge fund managers who specialise in one sector only.

Asymmetric Returns

and Sector Specialists

What today is referred to as active management is really passive, as it uses the same risk management techniques as enhanced indexing (which is considered as passive money management) and the same definition of risk (tracking risk) as do index funds.[1] The distinction between passive and active is merely the magnitude of the tracking error constraint. If risk management is passive the return distribution of the managed portfolio will be similar to that of the underlying market. Putting it crudely: if volatility is at 10 percent, the passive (or the so-called active) portfolio will have a volatility of around 10 percent, with higher moment risk characteristics similar to the benchmark. If volatility is at 50 percent, the portfolio volatility will be around that level as risk is defined and managed relative to the market benchmark. In other words, the benchmark long-only manager does not have a mandate to manage total risk.

In this paper we make the case for actively seeking asymmetric returns. As an example, we examine at absolute return sector specialists, ie, long/short hedge fund managers dedicated to one sector only. These managers have a more narrowly defined field of operation than generalists, that is, they are more specialised with respect to the

[1] See UBS Warburg [2001] and Ineichen [2001, 2003]

underlying sector. By 'asymmetric returns' we mean a return distribution that is different to a normal distribution. In an ideal world, all returns would be positive, that is, the distribution skewed to the right. One assumption made in this report is that all investors prefer asymmetric returns over symmetric returns. This assumption is based on the following three notions which, we believe, are common to all investors. The first two notions are from Markowitz [1952, 1959] and the third from Kahneman and Tversky [1979][2]:

(1) More return is preferred over less,

(2) Certainty is preferred over uncertainty,

(3) Losses weigh stronger than profits, that is, disutility from capital depreciation is larger than utility from capital appreciation.

[2] Note that Kahneman and Tversky [1979] were not the first to challenge utility theory: Friedman and Savage [1948] proposed that the coexistence of the human tendency to gamble and risk avoidance might be explained by utility functions that become concave upward in extremely high range. Markowitz [1952, 1959] also pointed out that losses weigh stronger than profits. Whereas Markowitz left it up to the investor to choose where along the efficient set he would invest, Roy [1952] advised choosing the single portfolio in the mean-variance efficient set where a 'disaster level' return is determined below which the investor places a high priority not falling below. Savage [1954] showed that the axioms from which expected utility theory is derived are undeniably sensible representations of basic requirements of rationality. Samuelson [1965] explains the violation of expected utility theory. Although this research preceded prospect theory, it illustrates the importance of the kink in the value function from Kahneman and Tversky.

If a manager defines risk relative to a benchmark, the portfolio will mimic the return distribution of the underlying market benchmark. However, hedge fund managers are not driven by market benchmark but by P&L. This means risk is defined in absolute terms (we use the term 'total risk'). If risk is defined as total risk and the investment process is driven by P&L, the manager will be taking into account these three factors .

The first factor (more return) is obvious. However, a hedge fund manager, unlike a relative return manager, also manages the second and third of the three notions actively: first, most hedge funds have a target volatility and control portfolio risk accordingly. Second, capital preservation is crucial, that is, avoiding large drawdowns is a major part of the objectives as well as the investment process.

It is with this latter point that sector specialists might have a problem. Traditionally, sector specialists had a long bias. This means that correlation of the long/short managers was high with the sector. This has proven to be a major disadvantage for this category, as, generally speaking, low correlation of absolute return strategies was one of the major reasons to invest in hedge funds in the first place.

The high correlation led to absolute drawdowns. One index for long/short specialists is under water (percentage loss from previous all-time high) by more than 50 percent. As we show later, this is not a lot when compared to long-only sector specialists. However, relative outperformance might help the marketing effort but, unfortunately, also triggers serious issues within the absolute return management firm: If there is a high watermark,

the performance fee will not kick in until losses are recovered. This gives principals an incentive to throw in the towel (and, after an extended sabbatical, start a new fund) and less senior staff an incentive to leave the firm and seek employment elsewhere.

As we show later, the historical performance of a diversified portfolio of sector specialists is impressive. The performance relative to the sector is even more impressive. This favourable track record could lead one to assume that sector specialists should be used as an alternative to gaining exposure to a sector: correlation to the sector is high while performance is superior to the passive long-only alternative. However, if the hedge fund has to shut down after a 20 percent drawdown for the aforementioned reasons, then the sustainability of the business model of the sector specialists has to be put in question.

A solution for sector specialists could be to abandon the long bias. If a sector specialist reduces his net exposure, portfolio volatility decreases as a result. If volatility is low, the probability of a 20 percent drawdown is lower than when volatility is high. By reducing the net long exposure, the sector specialist's business model becomes more sustainable. The sector specialist puts his information and/or analytical edge at work through thorough fundamental stock research, whereas portfolio volatility is controlled by avoiding directional bets on a portfolio level. This would mean, from the investors point of view, that sector specialists become not an alternative for sector long exposure, but an alpha generating satellite to the core portfolio. In other words, the long-only style is passive and gives exposure to a sector while long/short exposure is active and should exploit investment opportunities *within* the sector.

In the following we discuss the historical performance of sector specialists, namely long/short managers in the technology, health care and financials sector. The main angle is the focus on asymmetrical returns, ie, focus on the P in P&L and trying to avoid the L.

Sector specialists

Sector specialist hedge funds are a special type of long/short equity fund. At the most general level, they exploit opportunities in one sector only. The following section compares some sector hedge fund indices with the sector indices, that is, a proxy for the long-only investment style. Exhibit 1 summarises the main performance statistics for the three strategies. The analysis was conducted over different time periods owing to data availability.

<<< Exhibit 1 around here >>>

Absolute annual returns were between 17 and 21 percent for the long/short sector specialists and between 8 and 12 for the long-only sector specialists. On a return as well as a risk-adjusted return basis, the absolute return strategies have outperformed long-only strategies by a wide margin. We believe it unlikely that the substantial outperformance can be explained by survivorship bias or any other imperfections in the data collection process.

In the following three sections we compare the long/short alternative with a long-only proxy.

Technology

Exhibit 2 compares the HFRI Technology Index with the Nasdaq Composite Index. The observation period for this analysis is from January 1991 to July 2002 (138 months). All returns are in US dollars.

<<< Exhibit 2 around here >>>

Exhibit 2 speaks for itself. The hedge funds index, a diversified exposure to a group of absolute return managers investing in technology stocks on a long/short basis, was superior in all aspects: Annual absolute as well as risk-adjusted return and maximum return were higher, whereas all risk characteristics were lower. However, correlation, for what it is worth, was high. The correlation coefficient between the hedge funds index and the Nasdaq index over the whole observation period was 0.90. The high correlation suggests that exposure to this type of investment was, in the past, not a portfolio diversifier. The investor trades less liquidity and less regulatory protection for superior risk-adjusted performance. Both skew and excess kurtosis were negligible.

Exhibit 3 compares the frequency distribution (5 percent increments) of the HFRI Technology Index with the frequency distribution of the Nasdaq Composite Index. A negative value shows that the hedge funds index has fewer observations than the long-only equity index in that

particular bucket (dark bars). The light bars along the lower x-axis show the frequency distribution of the 138 monthly returns of the hedge funds index.

<<< Exhibit 3 around here >>>

The main focus point of Exhibit 3 is the left-hand side, which reveals where the superior performance comes from: by avoiding large losses. A diversified exposure to technology hedge funds has resulted in fewer occurrences of a monthly loss between -10 percent and -25 percent. On the other side there are also fewer hedge fund returns in the 15-20 percent bucket. In other words, hedge funds avoid large swings on the downside, but do not participate in large upswings (most often a rebound after a large decline) as a long-only strategy does. However, the long/short strategy has more months where the returns are in the 0-5 percent and 10-15 percent bucket.

A large loss followed by a rebound is bad to the investor. A loss of 40 percent diminishes an investment of 100 to 60. A 40 percent rebound brings the investment only back to 84. A 40 percent loss requires a 67 percent rebound to recover losses.

Exhibit 4 shows what avoiding large losses means to wealth creation (or preservation). The Exhibit shows the wealth of two investments starting at 100 in January 1997. The first investment is the long-only investment style, in this case the Nasdaq Composite. The second column is the long/short equity investment, the HFRI Technology Index.

<<< Exhibit 4 around here >>>

Exhibit 4 shows that avoiding losses is a laudable concept. Exhibit 4 also shows that the long-only investment had a higher return in the first three years – a total return of 215 percent compared with the 208 percent of the absolute return portfolio. This higher performance is due to long-only managers, on average, taking more market risk. However, the subsequent two-and-a-half year period resulted in a loss of 67 percent for the former and a loss of 40 percent for the latter (based on year-end and mid-year wealth levels). This, we believe, is a big difference, manifested in the estimated time it takes to recover losses. At an annual rate of eight percent, it will take until 2017 to move from 103 (July 2002) to the year-end high of 315 (December 1999). However, the hedge fund index is under water by only 40 percent. At a rate of eight percent per year, it would take less than seven years to move from 184 to 308.

Exhibit 4 begs the question what kind of investment the retail investor needs protection from – outright exposure to a volatile asset class (left column in Exhibit 4), or hedged (or semi-hedged in this case) exposure to a volatile asset class. The fact that occasionally a hedge fund goes bankrupt (as do listed companies) does not matter in this debate, as single-manager (or single-company) risk is a non-systematic risk that can be eliminated or strongly reduced through diversification.

Correlation between the two proxies in Exhibit 4 was close to one in the period from 1997-99, during the bull market. The normalised long-only proxy fell from 315 to 103 in

2000-02. The long/short proxy fell from 308 to 184. In other words, correlation is one on the way up and less than one on the way down. The losses of the long/short proxy in the bear market could be viewed as a call option premium outlay for a potential rebound in the Nasdaq. If the Nasdaq starts increasing again (which is a possibility), correlation is likely to move toward one again.

Exhibit 5 illustrates visually what we mean with asymmetric returns. The Exhibit shows average quarterly returns in down markets versus average quarterly returns in friendly markets for the calendar quarters from first quarter 1991 to second quarter 2002. We have subtracted 100 basis points from the quarterly returns of the hedge funds index to account for any data imperfections. Survivorship bias in hedge fund data is estimated to be around 300 basis points per year.

<<< Exhibit 5 around here >>>

Exhibit 5 reveals some interesting aspects of substituting long-only exposure with long/short exposure. The asset management industry is about alpha.[3] However, this might change.[4] Intuition (as well as to some extent Exhibit 3) indicates that long-term superior returns is at least partially derived from not losing one's shirt, that is, risk management where risk is defined as total risk. Risk management in absolute return space is usually not associated with

[3] At least from a marketing perspective. See for example Schneeweis and Spurgin [1999].

[4] Our hypothesis as to how the active asset management industry could change is outlined and discussed in Ineichen [2003] as well as in Ineichen [2001] and UBS Warburg [2001].

generating alpha as the term *alpha* is normally used to explain the part of the variance not explained by beta (market benchmark).

The observation that the average positive quarterly return of technology hedge funds is nearly equal to the average quarterly returns in the Nasdaq Composite Index in Exhibit 5 is coincidence. However, what is not coincidence is that absolute return managers do not follow the benchmark down on a one-to-one basis. One could argue that correlation is elastic on the upside but inelastic on the downside. Long-term superiority is achieved from balancing investment opportunities with total risk. Investment opportunities in equity markets might not be identical when the market trades at 10x prospective earnings to when it trades at 100x prospective earnings. The absolute return manager distinguishes between the two. The relative return manager, too, distinguishes between the two. The difference is that the relative return manager can do little about it because risk is defined as tracking risk and not total risk.[5]

Exhibit 6 shows the "under water perspective" of the long/short and long-only index. The two indices in Exhibit 6 are shown as a percentage of their previous all-time high. In other words, the index line is between zero (eg, nationalisation) and 100 percent (trading at all-time high) by definition. The Exhibit next to the line measures the annual compounding rate of return (CARR) for the whole observation period.

<<< Exhibit 6 around here >>>

[5] We have addressed the difference between focusing on total risk as opposed to tracking risk at length in UBS Warburg [2001] and Ineichen [2003].

If risk were defined as not losing one's shirt, then we see investing in hedge funds as a means to higher returns with less risk.[6] The hedge fund index lost less while compounding investors' wealth at a higher annual rate of return (19.8 percent versus 11.6 percent for the Nasdaq).

Healthcare/Biotechnology

Exhibit 7 compares the HFRI Sector Healthcare/Biotechnology Index with the AMEX Biotechnology and Pharmaceuticals Index. The observation period for this analysis is over a nine and a half year period (115 months), from January 1993-July 2002.

<<< Exhibit 7 around here >>>

The long/short index has outperformed the long-only index on a risk-adjusted return (here measured by Sharpe ratio) due to higher returns and lower volatility. The worst one-month and worst 12-month drawdowns for the long/short index were around half of those of the long-only index, while the highest 12 month return of the long/short index was also around half that of the long-only proxy. Correlation was high at 0.84. Both indices have moderate excess kurtosis. The high excess kurtosis of 5.6 for the long/short index is from

[6] In UBS Warburg [2000] and Ineichen [2003] we showed that risk is slightly more complex than the analogy with losing one's clothing suggests.

a positive 35 percent return in February 2000. Exhibit 8 compares the two return frequency distributions.

<<< Exhibit 8 around here >>>

Exhibit 8 shows that the superior performance of the long/short index is primarily derived from having fewer large losses and many more returns in the 0-5% bucket. The return comparison in Exhibit 7 makes it clear that the more positive outliers of the long-only index do not balance or even overcompensate the large losses. The mathematics of this phenomena is as follows: a loss of 50 percent diminishes an investment of 100 to 50. A 50 percent recovery brings the investment only to 75. In other words, to recover a 50 percent loss, a 100 percent recovery return is required.

<<< Exhibit 9 around here >>>

Exhibit 9 shows that from January 1997 to July 2002 the long-only index has outperformed the long/short index. However, the long/short index in Exhibit 9 had a positive return in the two-and-a-half year period ending in July 2002. Long/short managers often list in their marketing material that they can make money in bull as well as bear markets. This is true, in theory. In practice this is not always the case as the opportunity set is normally correlated with the performance of the market. Long/short has a positive correlation with the underlying equity market. The superior performance is

derived from, generally speaking, losing less when the opportunity set changes against one's favour.

Exhibit 10 shows average quarterly returns in down markets versus average quarterly returns in friendly markets for the calendar quarters from first quarter 1992 to second quarter 2002. We have subtracted 100 basis points from the quarterly returns of the hedge funds index.

<<< Exhibit 10 around here >>>

Exhibit 10 compares the hedge fund index with the AMEX Biotechnology Pharmaceuticals Index. The average underperformance of the hedge fund index in rising markets was 6.6 percentage points, whereas the outperformance in falling markets was around 9.3 percentage points. In other words, the return profile is also asymmetrical – a phenomenon also found with most other long/short equity strategies.

<<< Exhibit 11 around here >>>

Exhibit 10 showed that there were periods where the long-only strategy had outperformed a basket of hedge funds operating in the Healthcare/ Biotechnology sector. However, Exhibit 11 shows that the long/short index has far superior wealth preservation characteristics. Long/short investors compounded at nearly twice the rate over the full

nearly ten-year period.[7] The focus on managing total risk leads to asymmetric returns which, eventually, should lead to long-term superior performance characteristics.

Financials

Exhibit 12 compares the HFRI Sector Financials Index with the NYSE Financials Index. The observation period is from January 1992 to July 2002.

<<< Exhibit 12 around here >>>

The index of hedge funds focusing on investment opportunities in the financial sector outperformed the NYSE Financials long-only index by a wide margin with lower volatility. In other words, risk-adjusted returns were substantially higher than for the long-only investment proxy. The monthly drawdown was only slightly smaller for the hedge fund index (-20.7 percent versus -24.3 percent) but slightly higher over a 12-month period (-17.7 percent versus -13.8 percent). The monthly drawdowns were higher (ie, losses larger) than the 12-month drawdowns for both indices.

<<< Exhibit 13 around here >>>

[7] Note that the observation periods were determined by data availability.

Exhibit 13 shows that the superior performance is derived from fewer monthly observations in the -10 to 0 percent buckets and substantially more returns in the 0 to 5 percent bucket.

The frequency distribution of the hedge fund index has an extremely high excess kurtosis of 10.6, compared with 4.8 for the NYSE Financials Index in the same time period. The monthly loss of 20.7 percent for the long/short index in August 1998 was a 5.7-sigma event resulting in the high excess kurtosis figure of 10.6. The loss of the long-only proxy was a negative absolute return of 24.3 percent but "only" a 5.0-sigma event. The reason why excess kurtosis for the long-only index is lower despite the magnitude of the loss being higher, is because the volatility is higher for the long-only index. In other words, a 24 percent loss is perceived as less of an outlier if volatility is 16.9% than when volatility is 12.5%, as with the long/short index. This is an indication that excess kurtosis is not a valuable measure on a stand-alone basis. It needs to be put into context of portfolio volatility. If the August 1998 return is deleted for both time series, both indices show roughly zero excess kurtosis, that is, no fat tails.

<<< Exhibit 14 around here >>>

Exhibit 14 shows a somewhat unusual feature. The returns for the two periods (1997-99 and 2000-02) are not correlated. The returns for the NYSE Financials Index were 47 percent for the period 1997-99 and only 3 percent for the subsequent two and a half years. The magnitude for the hedge fund proxy is the other way around. The HFRI

Financials Index had a return of 29 percent in the first period and a much higher return of 63 percent in the subsequent period. The reason for this difference in direction and magnitude is that the long-only proxy is purely dependent on the direction of the subgroup of the asset class (in this case the NYSE Financials Index). The long/short proxy is a function of the investment opportunities within the subgroup of the asset class.

Exhibit 15 shows average quarterly returns in down markets versus average quarterly returns in friendly markets for the calendar quarters from first quarter 1991 to second quarter 2002. We have subtracted 100 basis points from the quarterly returns of the hedge funds index.

<<< Exhibit 15 around here >>>

Exhibit 15 shows the familiar pattern for long/short equity: symmetrical returns for the long-only index and asymmetric returns for the long/short proxy. In a relative context, this means slight underperformance in positive quarters and significant outperformance in negative quarters. Long/short equity seems to follow the Wall Street wit, according to which the best way of making money is not losing it. We believe illustrations such as the one shown in Exhibit 15, potentially, are just a further nail in the coffin of what today is still referred to as active money management.

Conclusion

To some, long/short equity is the archetype of a hedge fund. Long/short equity, in the past, had high risk-adjusted returns, high volatility when compared with arbitrage strategies and low volatility when compared to long-only investment strategies and high correlation with equities. The dispersion between different long/short equity managers is wide and is not expected to narrow any time soon.

A case could be drawn that outperformance will not be as high in the future as it was in the past. The average outperformance of the HFRI Equity Hedge Index against the MSCI World Total Return Index in the six-year period from 1990-95 was 15.4 percent per year (22.3 percent versus 6.9 percent) but "only" 11.3 percent per year (18.4 percent versus 7.1 percent) in the six years to 2001.[8] Economic logic and common sense suggest that this trend (decreasing outperformance) should continue. It is unlikely that a superior investment vehicle can maintain its superiority forever. Economic rents have a tendency to evaporate. Once the last pension fund trustee and plan sponsor has bought into the investment case for absolute return strategies, the alpha will be gone (or spread over a much larger population of investors). On a more positive note, the evaporation of alpha will likely not happen overnight. In 2002, close to 100 percent of UK pension funds were averse to hedge funds and around 70 percent in the US. In Germany, hedge funds were still viewed as outlaws by government and press. The conversion of pension fund boards, trustees, and other intelligent and prudent laymen is a slow process and could unfold over

a period of 10 years. By comparison, it took more than a decade for derivatives not to be viewed as a tool of the devil, but an instrument for controlling risk.[9]

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[8] The outperformance against the S&P 500 (total return) Index was 9.3 percent in the first six-year period and 5.7 percent in the latter.

[9] Although in the United Kingdom the general belief is still that it was derivatives (as opposed to corporate governance) that brought down one of the oldest banks in the country (Barings Bank). As a result, asset managers on some occasions are still constrained from using derivatives in portfolios managed for pension funds.

Endnote

This article draws on material from UBS Warburg [2002] and Ineichen [2003]. The views and opinions expressed in this article are those of the author and are not necessarily those of UBS Warburg. UBS Warburg accepts no liability over the content of the article. It is published solely for informational purposes and is not to be construed as a solicitation or an offer to buy or sell any securities or related financial instruments.

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Exhibit 1: Performance comparison long-only versus long/short

	Annual return (%)	Volatility (%)	Sharpe ratio (5%)	Under water (%)
Technology				
long-only	11.6	27.1	0.24	-71.7
long/short	19.8	20.6	0.72	-52.1
Health Care/Biotechnology				
long-only	8.1	43.2	0.07	-53.0
long/short	17.4	23.5	0.53	-26.5
Financials				
long-only	12.4	16.9	0.44	-17.9
long/short	20.7	12.5	1.26	-6.7

Source: Hedge Fund Research, Bloomberg, Datastream

Under water: percentage loss from previous all-time high based on month-end returns.

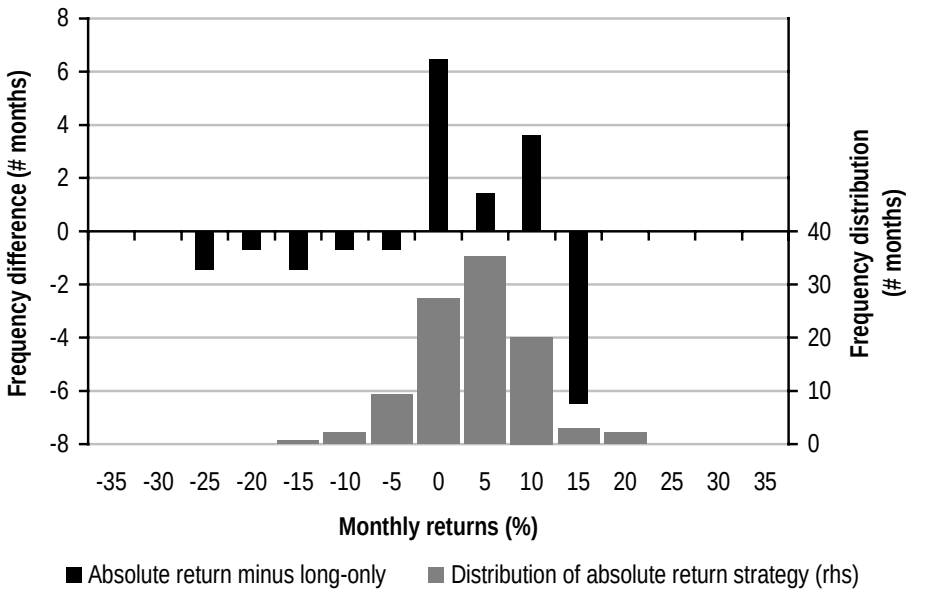
Time periods: Technology from January 1991 to July 2002; Health care from January 1993 to July 2002; Financials from January 1992 to July 2002.

Exhibit 2: Long-only versus long/short in the technology sector

	Annual return (%)	Volatility (%)	Sharpe ratio (5%)	Worst 1-month drawdown (%)	Worst 12-month drawdown (%)	Highest 12-month return (%)	Correlation	Excess kurtosis	Skew
NASDAQ Composite	11.6	27.1	0.24	-26.0	-59.8	105.3	1.00	1.58	-0.76
HFRI Technology	19.8	20.6	0.72	-16.4	-37.6	169.0	0.90	1.02	-0.03

Source: Hedge Fund Research, Datastream

Exhibit 3: Comparison of return frequency distributions



Source: Hedge Fund Research, Datastream

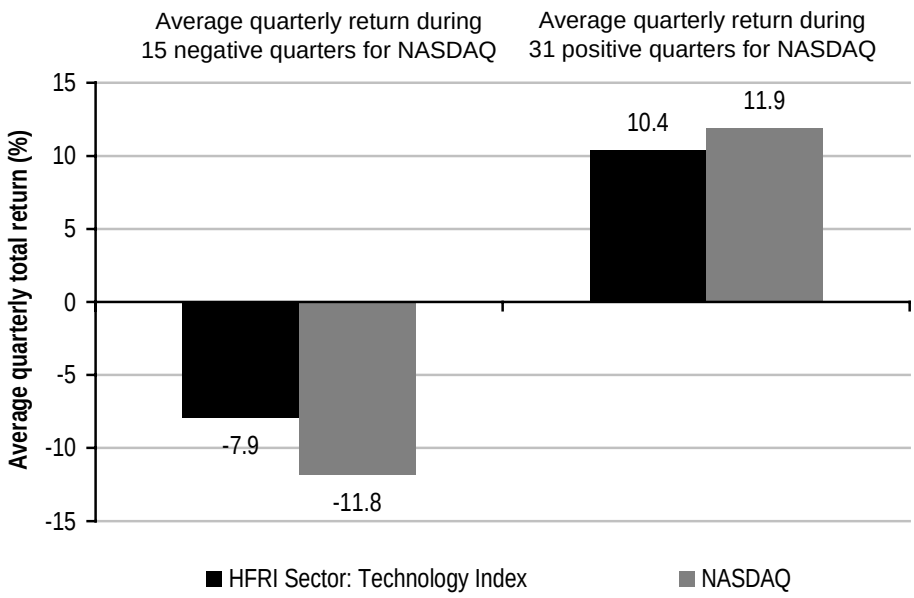
Exhibit 4: Comparison of wealth creation

	NASDAQ Comp.	HFRI Technology
Initial investment	100	100
Dec-97	122	107
Dec-98	170	137
Dec-99	315	308
Dec-00	191	261
Dec-01	151	227
Jul-02	103	184
Return 97-99	215%	208%
Return 00-02	-67%	-40%
Under water	-67%	-40%
Loss recovery return*	206%	67%
Recovery at 8% pa	Feb-2017	Apr-2009

Source: Hedge Fund Research, Datastream

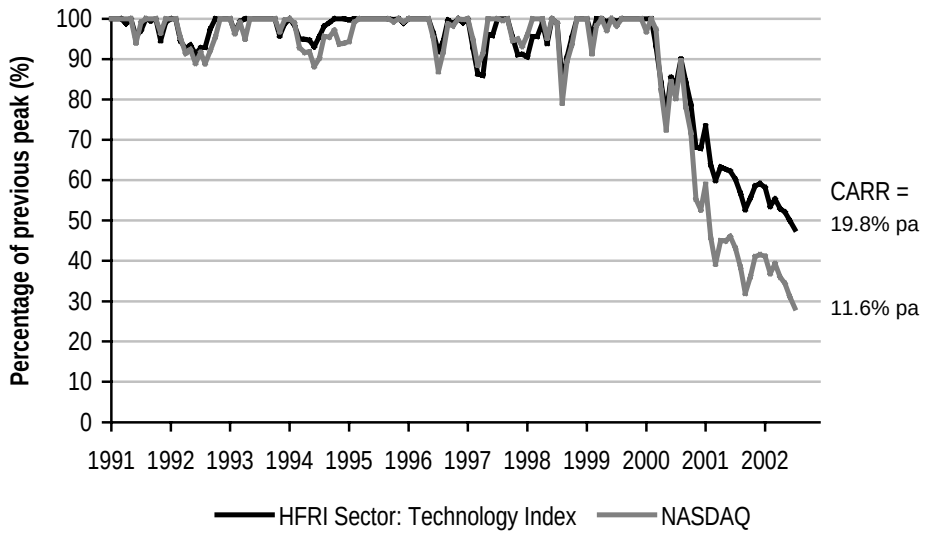
* Return required to recover losses.

Exhibit 5: Average negative versus positive returns



Source: Hedge Fund Research, Datastream

Exhibit 6: Under water perspective



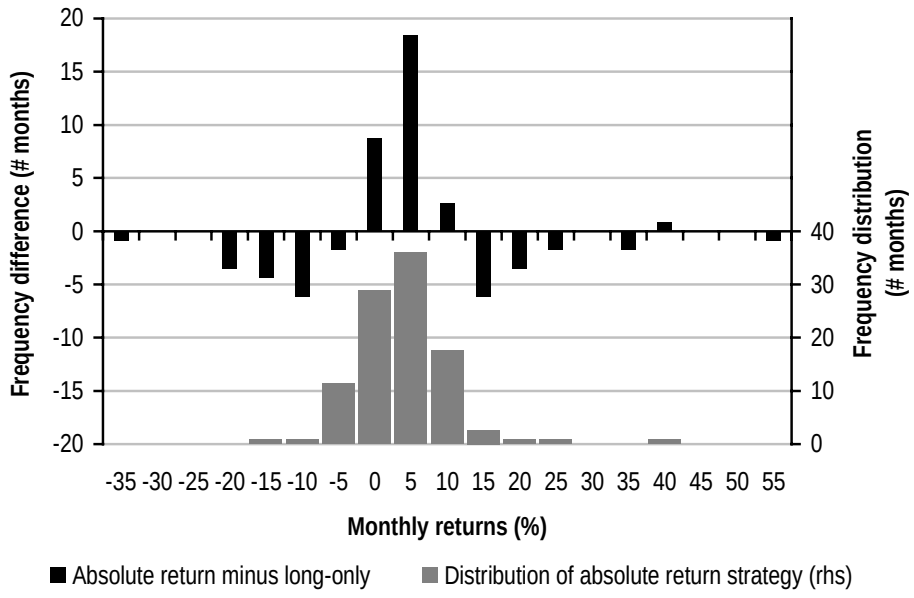
Source: Hedge Fund Research, Datastream
CARR: Compounded annual rate of return

Exhibit 7: Long-only versus long/short in the health care/biotechnology sector

	Annual return (%)	Volatility (%)	Sharpe ratio (5%)	Worst 1-month drawdown (%)	Worst 12-month drawdown (%)	Highest 12-month return (%)	Correlation	Excess kurtosis	Skew
AMEX Biotechnology/Pharmaceuticals	8.1	43.2	0.07	-39.3	-43.0	296.7	1.00	2.13	0.35
HFRI Health Care/Biotechnology	17.4	23.5	0.53	-19.5	-19.1	144.6	0.84	5.64	1.12

Source: Hedge Fund Research, Bloomberg

Exhibit 8: Comparison of return frequency distributions



Source: Hedge Fund Research, Bloomberg

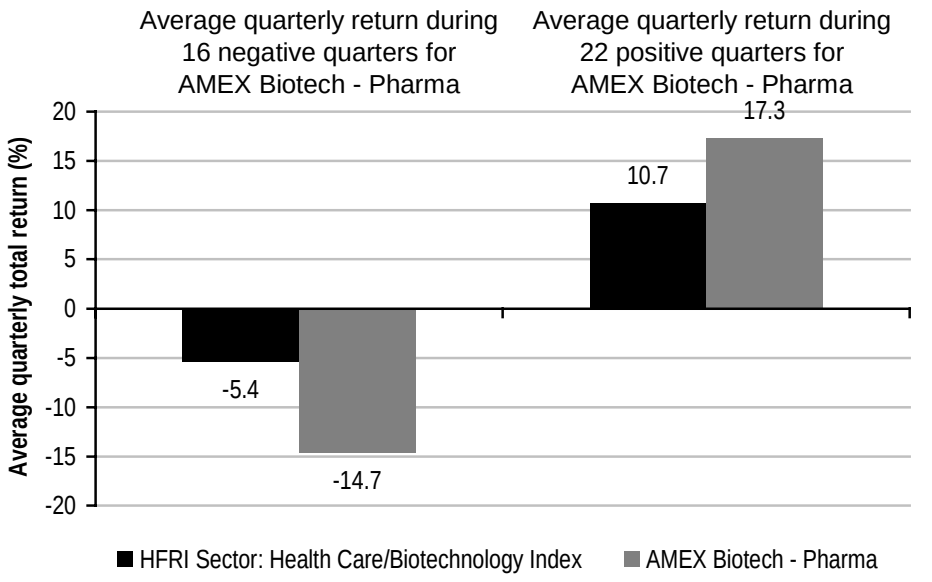
Exhibit 9: Comparison of wealth creation

	AMEX Biotechnology - Pharmaceuticals	HFRI Health Care / Biotechnology
	100	100
Dec-97	113	101
Dec-98	122	108
Dec-99	274	159
Dec-00	442	240
Dec-01	420	246
Jul-02	252	194
Return 97-99	174%	59%
Return 00-02	-8%	22%
Under water	-43%	-21%
Loss recovery return*	75%	27%
Recovery at 8% pa	Nov-2009	Sep-2005

Source: Hedge Fund Research, Datastream

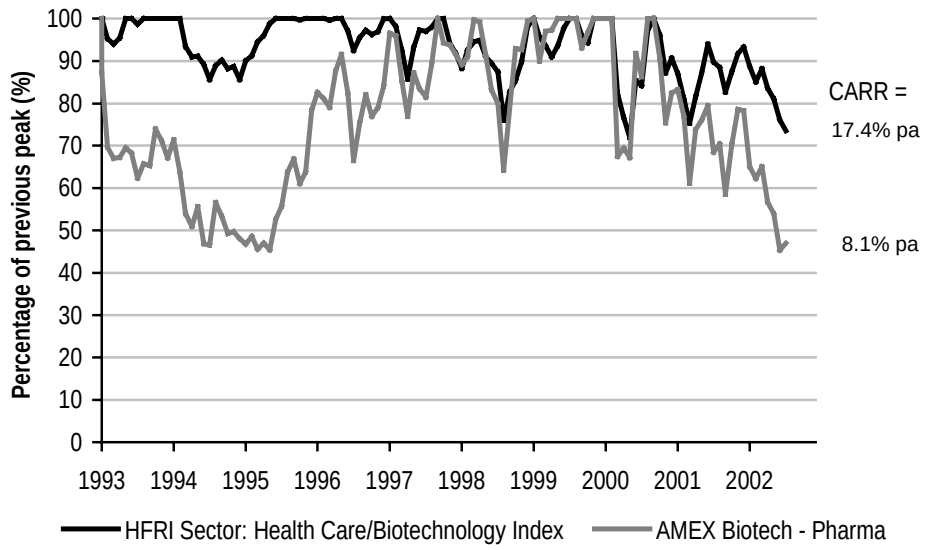
* Return required to recover losses.

Exhibit 10: Average negative versus positive returns



Source: Hedge Fund Research, Bloomberg

Exhibit 11: Under water perspective



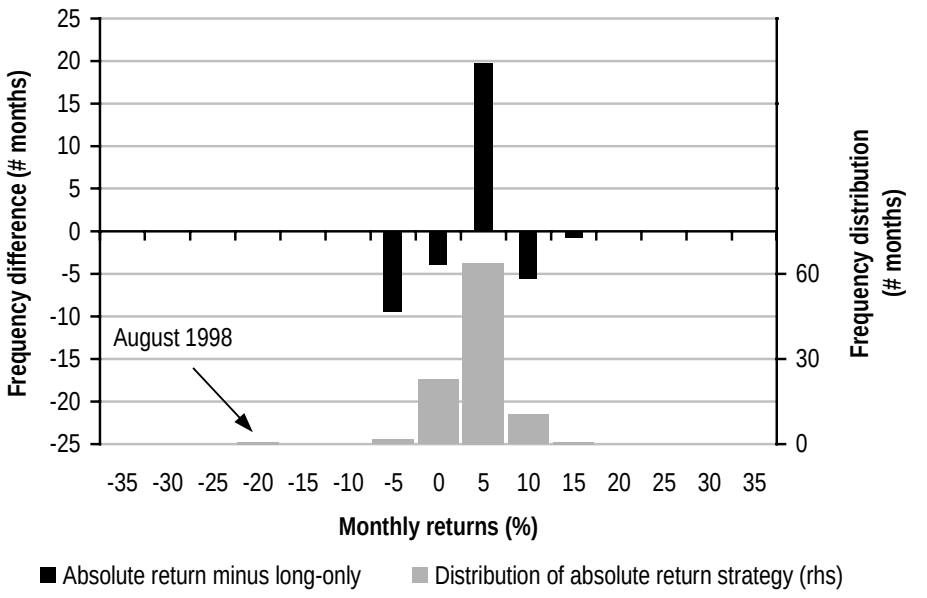
Source: Hedge Fund Research, Bloomberg

Exhibit 12: Long-only versus long/short in financials

	Annual return (%)	Volatility (%)	Sharpe ratio (5%)	Worst 1-month drawdown (%)	Worst 12-month drawdown (%)	Highest 12-month return (%)	Correlation	Excess kurtosis	Skew
NYSE Financials	12.4	16.9	0.44	-24.3	-13.8	60.2	1.00	4.80	-1.08
HFRI Financials	20.7	12.5	1.26	-20.7	-17.7	54.0	0.81	10.61	-1.98

Source: Hedge Fund Research, Datastream

Exhibit 13: Comparison of return frequency distributions



Source: Hedge Fund Research, Datastream

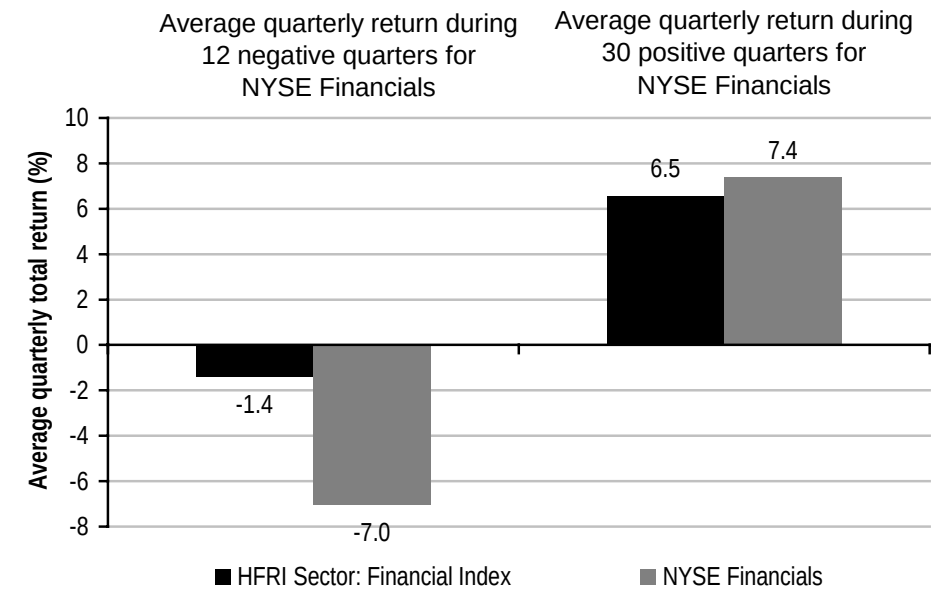
Exhibit 14: Comparison of wealth creation (January 1997-July 2002)

	NYSE Financials	HFRI Financials
Initial investment	100	100
Dec-97	141	149
Dec-98	148	131
Dec-99	147	129
Dec-00	184	176
Dec-01	169	207
Jul-02	151	209
Return 97-99	47%	29%
Return 00-02	3%	63%
Under water	-18%	0%
Loss recovery return*	22%	0%
Recovery at 8% pa	Feb-05	Index at peak level

Source: Hedge Fund Research, Datastream

* Required return to recover losses

Exhibit 15: Average negative versus positive returns



Source: Hedge Fund Research, Datastream