

Recent developments in the hedge fund industry

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1 Introduction¹

The rapid growth of the hedge fund industry has triggered a wide range of policy and regulatory discussions. Central banks are interested in the activities of hedge funds to the extent that they enhance or undermine the stability of the financial system. Representatives from a number of central banks have recently discussed the role of hedge funds and their impact on the financial system. This study was written in the context of these discussions.

The study reviews the most important developments in the hedge fund industry since the late 1990s. First, it surveys the evolution of the hedge fund industry's asset base and the main strategies to which assets are being allocated. Second, it examines the question of whether the activities of hedge funds may lead to excessive market volatility. Third, it discusses potential systemic risks associated with extreme leverage in the hedge fund industry. Finally, it touches upon the debate on hedge fund regulation.

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2 Definition

Definitions surrounding hedge funds and the hedge fund industry can give rise to confusion. In many ways, as the industry stands today, the word "hedge" has little definitional value.² Indeed, it can be misleading. At its core, hedge funds are best understood as potentially leveraged private investment vehicles deploying a wide range of largely unconstrained investment strategies with the aim of achieving high absolute rates of return (alpha).

Hedge fund managers typically invest a share of their personal wealth – often in the form of deferred compensation – in their own hedge fund vehicles in order to align their incentives with the interests of the external investors. Most hedge funds impose minimum investment requirements of at least USD 500,000. In many cases, these limits are significantly higher. Hedge funds typically have a dual fee structure. The investor pays an annual management fee of 1% to 5%. In addition, hedge funds usually charge incentive fees on any capital gains, in some cases above a pre-defined threshold such as the Treasury bill rate. Industry wide, these incentive fees vary between 20% and 50%. Alternatively, a number of fund managers charge all expenses of the management company to the fund. An increasing number of hedge funds impose investment lock-in periods of one to three years on their clients. During these lock-in periods principal, and in many cases profits, cannot be withdrawn. From the investor's point of view, liquidity is further constrained by the fact that even in the absence of, or beyond lock-in periods, redemption schedules are such that redemption orders can take three to six months to be executed.

² Alfred Winslow Jones is credited for the creation of the first hedge fund in 1949. His strategy consisted in combining long positions in undervalued stocks and short positions in overvalued stocks, in an attempt to minimise the influence of overall stock market moves. To magnify his portfolio's return, Jones added leverage. See L'habitant (2002).

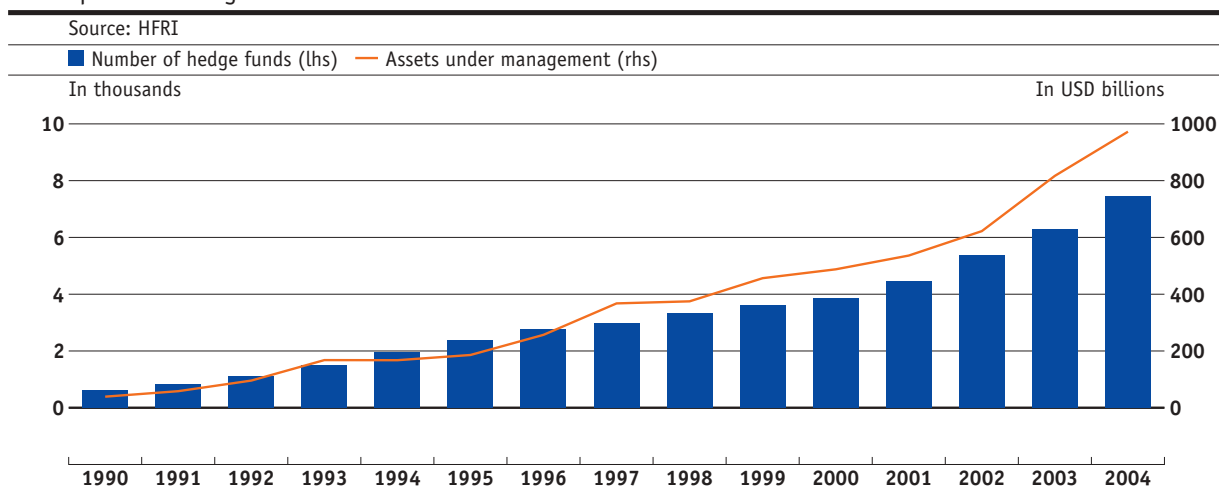
3 Capital base growth

During the last decade, the hedge fund industry has steadily grown in size. According to various sources, there were over 7400 hedge funds managing assets totaling USD 970 billion at the end of 2004 (Graph 1).³ In addition, USD 265 billion was held in privately managed accounts run by hedge fund managers. Not included in these figures is the significant pool of capital managed by the proprietary trading desks of global investment banks. Though not formally structured around hedge fund vehicles, the trading of these assets closely mirrors the investment activi-

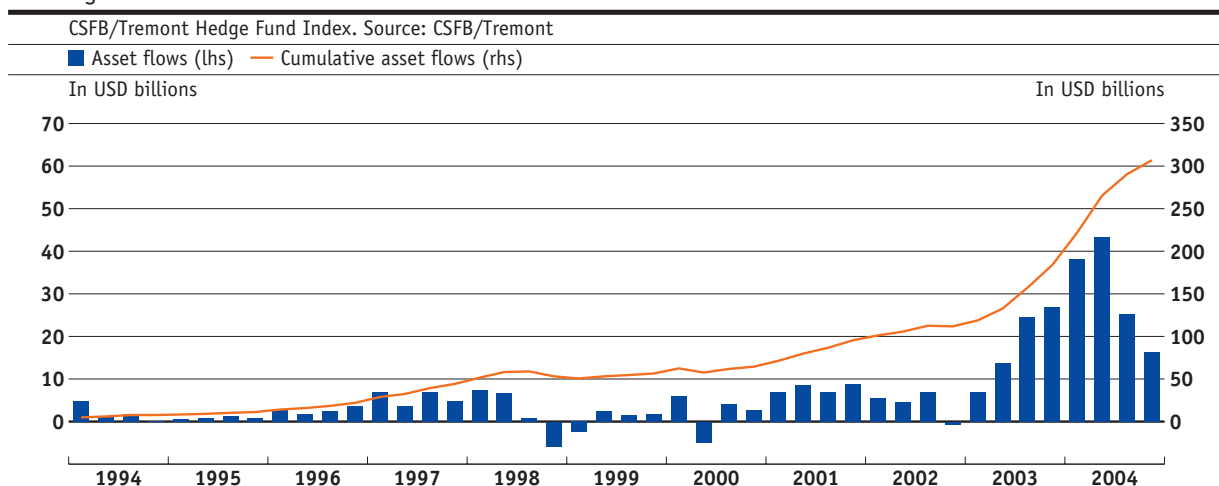
ties of hedge funds. Moreover, the compensation schemes of investment banks' proprietary desks increasingly reflect hedge fund compensation structures.

According to the CSFB/Tremont Hedge Fund Index, there has been only a few quarters with net outflows since 1994 (Graph 2).⁴ These outflows were associated with the Russian default, the Asian crisis and the bursting of the tech bubble. Since 2002, the pace of hedge fund investing has clearly accelerated. During the second quarter of 2004, total asset inflows topped at USD 43 billion, before receding to USD 25 billion in the third quarter.

Graph 1
Development of hedge funds



Graph 2
All hedge funds asset flows



3 Figures from Hedge Fund Research Inc, December 2004. Van Hedge Fund Advisors International, cited in an IMF (2004) study, estimate that 8800 hedge funds manage about USD 970 billion of assets.

4 The CSFB/Tremont Hedge Fund Index is the largest asset-weighted hedge fund index. Performance is calculated net of fees. The CSFB/Tremont Index is broadly diversified, encompassing around 400 funds across

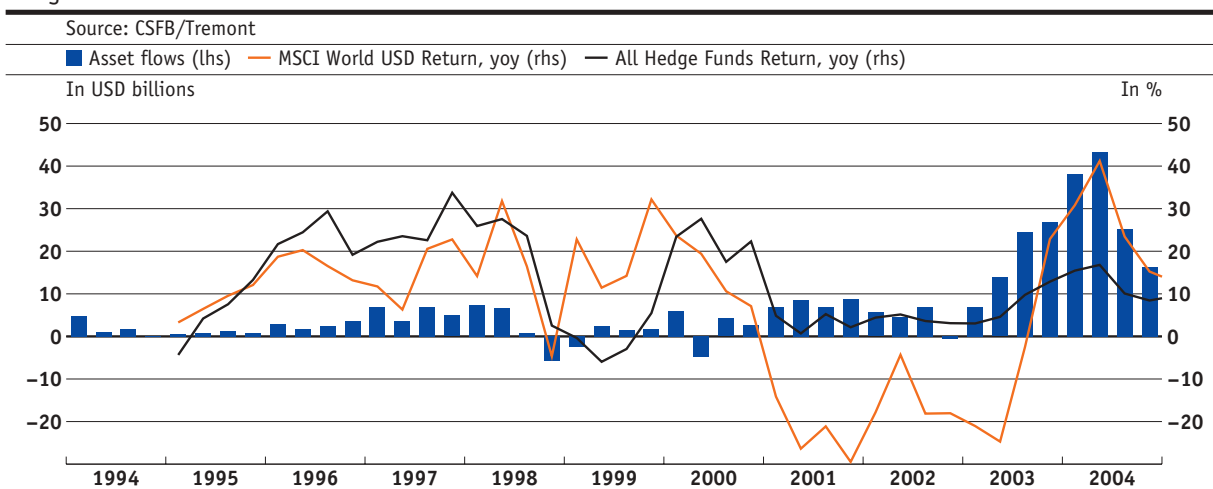
ten style-based sectors, and is representative of the entire hedge fund industry. Assets included within the CSFB/Tremont Hedge Fund Index amounted to USD 615 billion in September 2004.

Until the second half of the nineties, investors in the hedge fund industry were largely high net worth individuals. During the second half of the nineties, however, pension funds, endowments and other institutional investors began to allocate small percentages of their asset base to hedge funds. More recently, the promotion of funds of funds has encouraged new inflows to the industry.⁵ Notwithstanding industry flow data which suggest that assets from institutional investors have recently grown more rapidly than the overall industry capital base, the largest share of the industry's total client base continues to be private wealthy individuals, either as direct investors or through funds of funds vehicles.

The high relative rates of return have clearly contributed to the strong inflows (Graph 3). However, these figures need to be interpreted carefully. There is no definitive source for hedge fund data. Most vendor databases collect data that hedge funds disclose voluntarily. Many large hedge funds that are closed to new investors do not report to the data vendors. In addition, hedge funds that perform poorly often stop reporting to the vendor databases as their performance deteriorates (leaving the series open to 'survivor' bias). The databases are useful in understanding growth and trends within the hedge fund universe, but should not be relied upon as providing unbiased measures of the industry's performance.

The positive relationship between relative rates of return and inflows was particularly evident in the period between 1995 and 1998. In 1999, the hedge fund industry underperformed the MSCI (Morgan Stanley Capital International) World USD Index and inflows consequently slowed. The period between 2000 and 2002 brought renewed large inflows, driven by returns that were modest, but compared favourably to the losses of the MSCI World USD Index. In 2003 hedge fund returns increased though not nearly as much as the MSCI. Nonetheless, inflows reached record highs during that period. Overall, returns during the last few years have been much less spectacular than during the nineties. Even in 2003, most hedge fund managers were unable to match the returns achieved between 1995 and 1998. This decline in relative performance is associated with a rapid acceleration of inflows, leading to an apparent reduction in profit opportunities. The same pattern appears to be at work in 2004, where against the backdrop of record inflows, returns have declined markedly – annual returns in Q4 2004 were below 10%, compared with a 12.5% return for the MSCI World USD Index.

Graph 3
Hedge fund assets flows and returns



5 Funds of funds are investment pools which make allocations to a number of hedge funds, thereby seeking to benefit from diversification. They are typically operated by private banks, asset management firms or institution-

al asset managers (pension funds and endowments). They exist in virtually all strategy segments of the industry and typically combine different strategies in one fund of funds. The managers of these funds of funds negotiate

with the individual hedge funds on the size of investment and fee structure. These fees are passed on to clients, in addition to a management fee for the fund of funds itself.

4 Hedge fund strategies

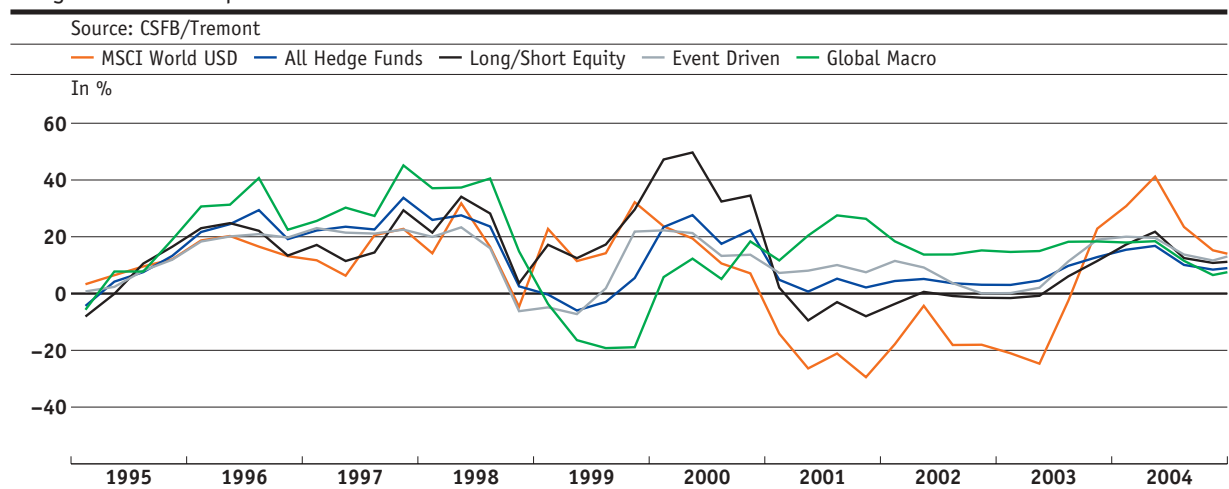
The following paragraphs focus on the different hedge fund strategies and returns as defined by CSFB/Tremont. Hedge funds are typically categorized according to their dominant strategies. These strategies are by no means the sole domain of hedge funds, with pension funds, university endowments, family offices and other asset managers all making use of these strategies at times. The performance of the various sectors is shown in Graph 4.

Long/Short Equity

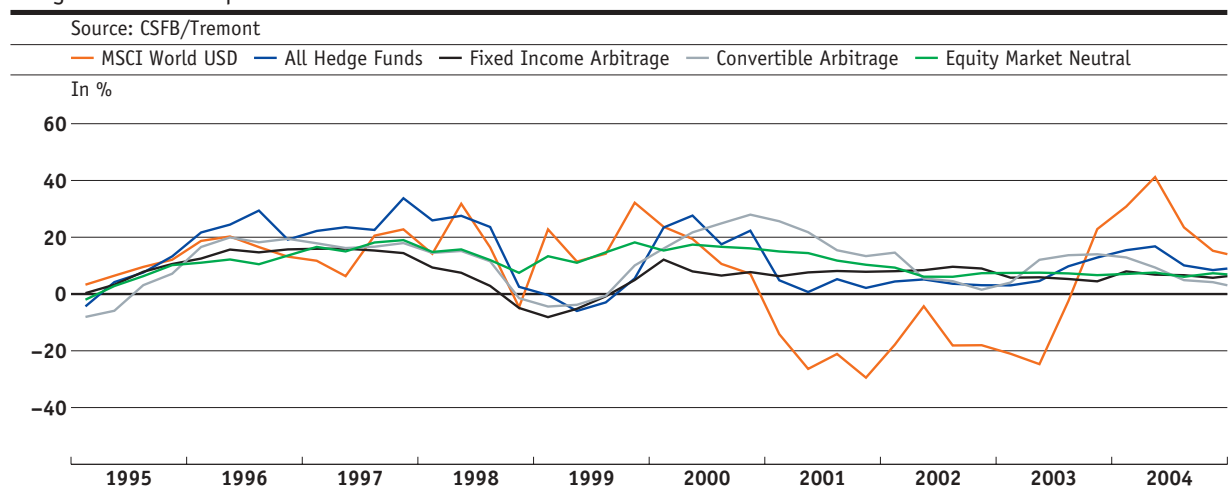
A long/short equity manager is long and/or short in equities, but not necessarily market neutral.

This category currently accounts for around one third of the hedge fund industry's capital base. Long and short positions can be held in value, growth, large cap and small cap stocks. Inflows were rather steady except for a large outflow in Q4 2002. Like other hedge fund categories, inflows picked up significantly in 2003; the USD 13.5 billion inflow in Q2 2004 represents the most significant sector-specific inflow since the inception of the CSFB/Tremont index. Returns averaged 16% during the nineties, were mostly negative in 2001 and in 2002, picked up again in 2003 and decreased again in 2004. Overall, returns have been slightly above the overall CSFB/Tremont hedge fund index (11%) and were characterized by the highest correlation with the MSCI index.

Graph 4a
Hedge funds sector performance



Graph 4b
Hedge funds sector performance



Event-driven

Event driven funds, which represent the second largest category, aim to generate profits from price movements associated with specific corporate events not yet fully anticipated by the market (e.g. restructuring, takeovers, mergers, liquidations or bankruptcies). Sub-categories are merger/risk arbitrage, distressed securities, regulation D and high yield. Steady inflows were interrupted towards the end of 1998 and again towards the end of 2002; inflows picked up strongly in Q3 2003. Returns have been close to average for the overall CSFB/Tremont hedge fund index.

Global Macro

Global macro strategies analyze shifts in macro-economic trends, with a view to capitalizing on directional opportunities across the full spectrum of markets, asset classes and financial instruments. The manager expresses his view by holding equity, bond, currency, commodity or derivative positions. In cumulative terms, this index has outperformed all other strategies, with a compound annual return of around 14% between January 1994 and December 2004. Over the past few years, global macro returns have been consistently higher than average hedge fund returns, though they have not reached the levels recorded at the end of the nineties. Nonetheless, the share of funds devoted to this strategy has declined from its peak of around 35% in 1994. Starting in early 2003, however, substantial inflows returned, with USD 16 billion invested in this category in the first three quarters of 2004.

Fixed Income Arbitrage

Fixed income arbitrage strategies aim to take advantage of price anomalies between related fixed income securities. Typical instruments are interest rate swaps, government bonds, the forward yield curve and mortgage-backed securities. Annual returns have been steady at around 7% since 1994. Inflows have increased significantly since 2003.

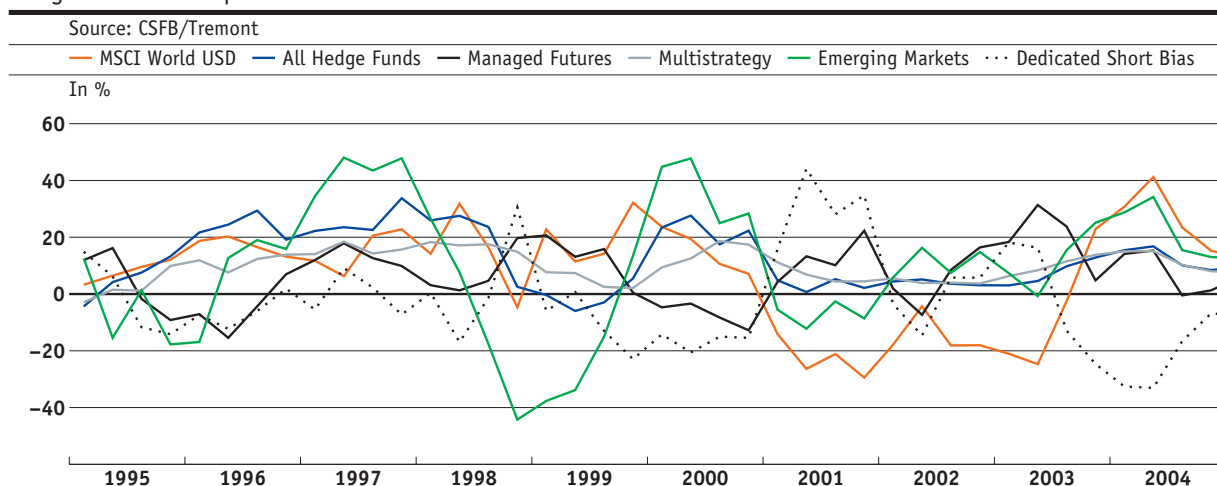
Convertible Arbitrage

Convertible arbitrage strategies aim to benefit from price discrepancies between convertible bonds and the common stock of the same company. Returns have generally been positive, except in 1998 and 1999. Capital inflows have been volatile over the past few years, while returns have been on a downward trend, consistent with diminished arbitrage opportunities.

Equity Market Neutral

Equity market neutral funds seek to exploit equity market inefficiencies. This typically involves being simultaneously long and short matched equity portfolios. Leverage is often applied to enhance returns. Inflows and returns have been relatively steady, although more recently returns have been particularly weak, owing perhaps to diminished arbitrage opportunities associated with strong inflows in the first quarter of 2004.

Graph 4c
Hedge funds sector performance



Managed Futures

Managed futures funds trade futures and derivatives in financial assets and tangible commodities worldwide, using systematic trend-following systems (computer driven) or a discretionary trading approach. Commodity trading advisors (CTA's) were originally distinguished from hedge funds because they were restricted to trading futures contracts. Today the distinction is blurred as CTA's often transact in over-the-counter derivative instruments. Until 2002 inflows were generally small, but they picked up significantly since, reaching USD 8.2bn in 2003 and USD 8.5bn during the first three quarters of 2004. Returns for managed futures funds are typically very volatile. For example, the quarterly returns for 2004 fluctuated between -10% and +12% with an average of 6%.

Other Strategies

Dedicated short bias funds hold net short positions, mostly in equities and equity derivatives. Emerging market funds take positions in a wide range of emerging market securities. Their strategies are often similar to long/short equity or global macro funds.

In terms of the most broadly aggregated taxonomy of different strategies, Fung and Hsieh (1999) distinguish between two broad approaches: the market timing approach (directional) and the non-directional approach (relative value). Market timing strategies take positions on the directions of markets. In their simplest form, they will be long or short

particular markets. Typical directional strategies are global macro, managed futures, emerging markets and dedicated short bias. Non-directional strategies attempt to extract value from arbitrage opportunities targeted at exploiting market anomalies and inefficiencies. A hedge fund manager using a non-directional strategy is long and short comparable securities and is market-neutral in so far as he or she seeks to eliminate systematic market risk. Typical market-neutral strategies are convertible arbitrage, equity market neutral and fixed income arbitrage.

There has been a pronounced shift in the investment style composition since the inception of the CSFB/Tremont Hedge Fund Index (Table 1). In general, capital has shifted from directional strategies to arbitrage/market neutral strategies. Typically, this shift is attributed to the arrival of institutional investors with a focus on risk adjusted returns. At the same time, computing and technological advances (e.g. modelling price movement patterns) have encouraged the shift to managed futures funds. Global macro funds have also seen substantial inflows after reaching a low point in 2001.

An ongoing issue for the hedge fund industry is that of style drift. This occurs when a hedge fund drifts away from its stated strategy. For example, in an environment where there is little convertible bond issuance, a hedge fund specializing in convertible bond arbitrage strategies may struggle to generate returns for its investors as well as fee income and new inflows for itself. The fund manager may then be tempted to generate returns using a different strategy.

Hedge fund strategies

Share of total hedge fund assets in percent

Table 1

	1994 Q1	2002 Q1	2004 Q3
Long/Short Equity	26.8	42.8	32.3
Event Driven	11.5	20.1	18.5
Global Macro	34.6	9.3	10.5
Fixed Income Arbitrage	5.8	5.6	7.1
Convertible Arbitrage	1.8	8.4	6.8
Equity Market Neutral	1.2	6.7	5.6
Managed Futures	6.0	2.9	5.1
Other	12.3	4.2	14.1

Source: CSFB/Tremont

5 Hedge funds and market volatility

Throughout the last twenty years, it has become conventional wisdom to associate hedge funds with extreme market volatility. Typically in this context, the focus has been on global macro and, more recently, on managed futures funds. They typically have a preference for trading similar instruments. More important still, both strategies share a directional approach: global macro funds take directional positions on the basis of fundamental economic developments, while managed futures funds seek to identify systematic market trends on the basis of technical market signals.⁶

Though different in approach, both strategies typically thrive during times of sustained market trends. Global macro managers have an incentive to identify trends that funds in the managed futures segment are likely to benefit from. As a result, many macro funds go to great length to try to follow, or better yet, to lead market trends triggered by the managed futures strategies. Indeed, some macro hedge funds are launching their own managed futures funds to help them identify typical trading trigger points.

The underlying argument associating hedge funds with excessive market volatility is based on the premise that hedge funds push market prices temporarily away from their equilibrium, either in the short- or medium-term. The traditional counter-argument sees hedge funds fundamentally as stabilizing market participants who identify arbitrage opportunities, take profits as these opportunities get eliminated and in the process provide the market with liquidity.

There is analytical work in support of both hypotheses. According to Devenow and Welch (1996) investors infer information from hedge funds and follow their lead, not least because hedge funds have the reputation of being well informed. The combined transactions of the leader and the follower can trigger important market movements (and hence add to market volatility).

On the other hand, according to Eichengreen et al. (1998) hedge funds are less likely to herd than other investors because they take great pain to prevent disclosure of their positions. Furthermore, there is little reason to believe that hedge funds are more likely to overwhelm a market than other large traders because hedge funds are rather small when compared to the risk capital available to other large investors. Eichengreen and Mathieson (2003) also provide argu-

⁶ Work by Olson (2004) suggests that earning excess returns from the latter is becoming increasingly harder to achieve.

ments for why hedge funds are less likely than other institutional investors to engage in positive feedback trading that amplifies market volatility. Hedge funds, unlike most mutual funds, are not bound by their prospectuses to invest inflows in the same manner as existing funds under management. Moreover, hedge funds are less likely to be forced to liquidate losing positions and thus sell in a falling market. They may be better able to ride out fluctuations because their investors are often locked in for substantial periods. Thus hedge funds often act as stabilizing speculators by selling fundamentally overvalued assets and buying fundamentally undervalued assets, thereby providing liquidity to the market.

Nonetheless, with regard to herding, Eichengreen and Mathieson (2003) conclude that limited econometric evidence suggests that hedge funds may indeed herd together, though there is little evidence that other investors regularly follow their lead. Herding based on information cascades can happen when information is asymmetric, for example with regard to monetary policy decisions. The lesson for policymakers is that policy transparency encourages investors to trade on fundamentals rather than simply go with the herd.

In a similar vein, Fung and Hsieh (2000) have provided an extensive overview of the role of hedge funds during the periods of market turbulence of the 1990s. They provide quantitative estimates of the market impact of hedge funds over a comprehensive set of market events. The authors found several episodes in which hedge fund activities were prominent and probably significantly impacted markets (Exchange Rate Mechanism (ERM) Crisis 1992, the European bond market rally 1993 and subsequent decline 1994). At the same time, there were other episodes where hedge funds appear to have had little or no market impact (stock market crash 1987, Mexican peso crisis 1994, Asian currency crisis 1997). In the latter case, Fung and Hsieh found no evidence that hedge funds were able to manipulate markets

away from their “natural paths” driven by economic fundamentals. Nor did the authors find any evidence of positive feedback trading by hedge funds. Most of the time hedge funds appear not to have acted as a single group or pursued unrelated trades. In a few periods, Fung and Hsieh (2000) found evidence of style convergence when both global macro and trend-following funds (i.e. managed futures) had large positions and traded in the same direction. They found no evidence, however, of herding between hedge funds and other investors. Based on this limited survey of analytical work, it is difficult to conclude that hedge funds decisively affect market volatility.

Direct observation of market price action may provide some additional clues. Consistent with the increased flow of new capital into the global macro and managed futures segment, a number of markets that managed futures strategies typically engage in have recently become more liquid, particularly in the area of commodities, as demonstrated by the increase in turnover and rise in non-commercial positions in the gold and oil future markets (Graph 5).

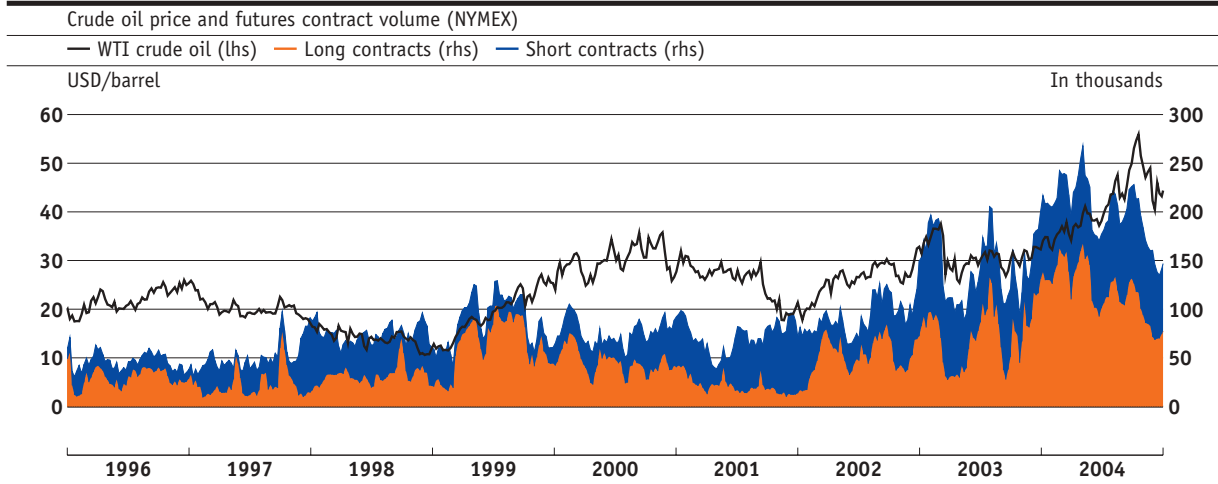
Whether the growth of the hedge fund industry has gone hand in hand with a change in market volatility, is difficult to assess. The increased significance of the industry since 1994 has not been accompanied by a clear change in market volatility (Graph 6).⁷ However, there have been episodes, e.g. between 1996 and 1999 or between 2001 and 2004, where inflows (outflows) into (from) hedge funds seem to have been associated with lower (higher) volatility.

Market observations also suggest that many technically driven hedge funds appear to hold similar positions on the basis of trading systems, driven by related trigger points.⁸ At least ex-post, one might therefore expect to be able to identify crowded technical points in the market. Analytically such points reflect moments of extreme market tension. An acceleration of an upward trend in prices, or a sharp reversal, can be a potential precursor to a new market equilibrium.

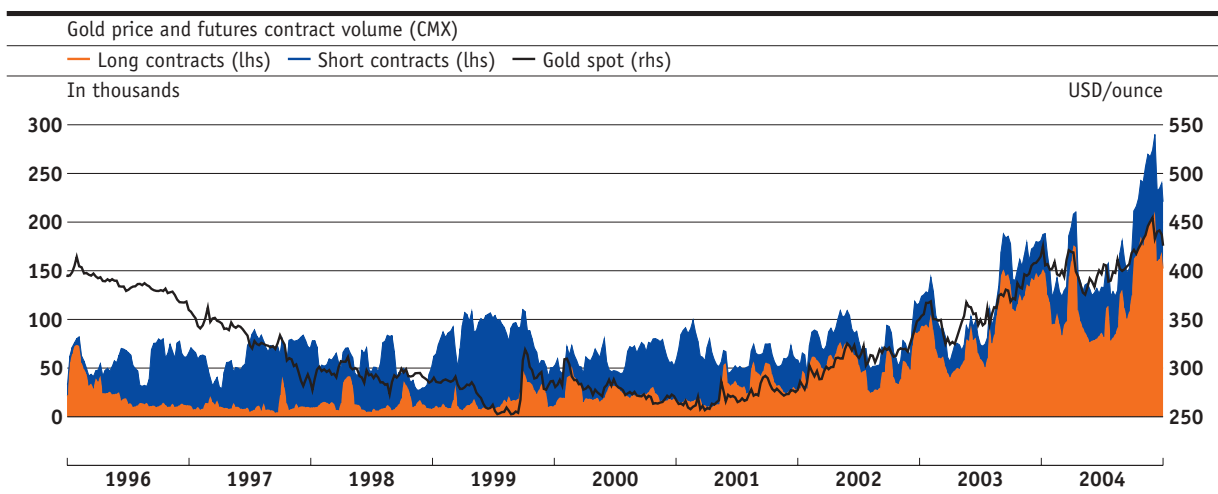
7 The implied volatility index calculated in Graph 6 is derived from normalized implied volatilities of at-the-money options in the stock (S&P), exchange (EUR/USD) and bond (10-year US Treasuries) markets.

8 For a discussion of clustering (or trigger points) in the foreign exchange market, see Osler (2003).

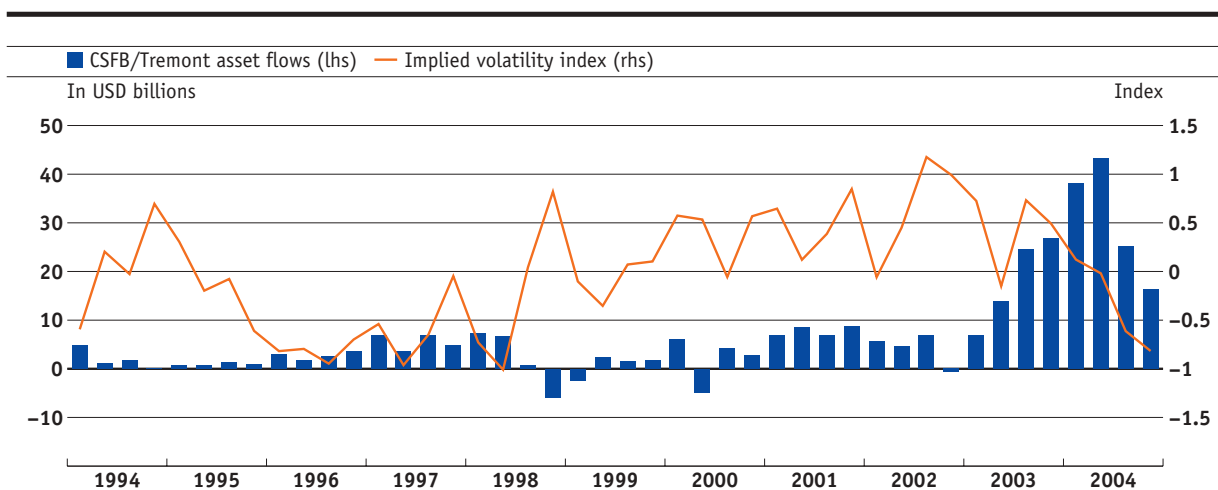
Graph 5a
Non-commercial positions in the oil futures markets



Graph 5b
Non-commercial positions in the gold futures markets



Graph 6
Asset flows and overall market volatility



There is some evidence that such dynamics may have occurred in recent months in various asset classes.⁹ A combined review of speculative positions in the market place, news flows and various hedge fund performance figures provides tentative evidence that heightened market volatility can at times be related to clustering patterns in the hedge fund industry. The following three examples provide a potential illustration of these dynamics.

- During the May to June 2003 period, speculative long positions in the US bond market appear to have been very large, based on the assumption that the Fed would have to reduce official interest rates below 1% because of deflationary risks. Long positions were further encouraged by market speculation that convexity hedgers (Fannie Mae, Freddie Mac) would eventually be forced to buy more duration and therefore drive interest rates lower. Ten-year Treasury yields promptly rallied by more than 80 basis points over the period until mid-June. This strongly trending market helped the hedge fund industry generate exceptional returns during the month of May 2003. The trend following CTAs, in particular, posted outstanding performances that month. However, the combination of a smaller-than-expected 25 basis point interest rate cut by the Fed on 24th June 2003, together with a discernible turn in language in the accompanying statement, took the market by surprise. A sharp sell-off in the bond market followed immediately. Generally negative hedge fund performance figures during the month of June are testimony to the gapping nature of the price movements following the Fed's interest rate decision.
- Data on speculative positions¹⁰ suggest that euro exposure was high and rising in mid-July 2004, prior to Federal Reserve (Fed) Chairman Alan Greenspan's monetary policy report to Congress. In his testimony, the Fed Chairman gave an inflation and interest rate outlook that was at the time perceived to be surprisingly "hawkish" by market participants. Immediately, following the testimony, long euro trades were covered on a large scale and the dollar appreciated sharply from 1.245 to 1.20 vis-à-vis the euro over the course of the following week.

- Another example relates to the recent evolution of crude oil prices. Data on speculative positions suggest that non-commercial traders such as investment banks and hedge funds have become more involved in crude oil since 2003.¹¹ Their net long positions were positively correlated with price movements (see Graph 5), a behaviour that may have amplified price movements.¹²

It is important to point out that extreme care needs to be exercised when interpreting such examples. First of all, any number of factors can cause markets to move to new equilibrium points. Second, price action is often shaped by overall liquidity conditions in a specific market segment. Sharp price movements are more likely to occur in markets where trading activity is light. Third, the nature of market participants engaged at any particular time will impact the nature of price movements. For example, if a specific concentration point is made up largely of managed futures accounts with similar trading systems, sharp gapping movements are likely to occur. If on the other hand, a concentration point results from a wide variety of hedge funds with different strategies holding similar positions, the price action is likely to vary due to the different reaction functions – a result of varying time horizons, loss tolerances and volatility appetites amongst the engaged hedge funds.

Analyzing price action is clearly not a precise science. Mature capital markets are made up of too many different types of market participants to infer systematic market behaviour, let alone specify behaviour by one relatively small category of market participants. Nevertheless, the previous examples suggest that it is at least plausible, particularly in relation to the managed futures segment of the hedge fund industry, that large asset pools have recently been deployed in related strategies which may have contributed to cases of heightened market volatility. Consistent with this, the largest systematic trend followers of the managed futures segment have recently posted similar performances. The correlation of monthly returns since January 2003 of six of the biggest trend following CTAs ranged between 0.5 and 0.9, with all funds posting exceptionally poor performances during the second quarter of 2004.

9 According to Rankin (1999) and Yam (1999) the activities of hedge funds were disruptive around the time of the Asian crisis in particular markets.

10 Non-commercial positions on the CME (Chicago Mercantile Exchange) EUR/USD contract as reported by the Commodity Futures Trading Commission (CFTC).

11 Non-commercial positions on the Nymex (New York Mercantile Exchange) crude oil contract as reported by the CFTC.

12 For further discussion about speculation in oil markets, see BIS (2004, p. 6).

The obvious counter-argument is that despite recent inflows, the managed futures component of the industry is simply not large enough to materially affect price action in important market segments. This argument overlooks two dimensions: First, as noted above, many macro hedge funds are also involved in similar trades. Second, it is not sufficient to evaluate the potential impact of the managed futures segment by looking at the nominal size of capital invested in the strategy. Market information, as well as survey data, suggests that the managed futures segment is significantly more leveraged than other parts of the hedge fund industry. As a result, the capital deployed in the managed futures segment is likely to be significantly higher than is suggested by the flow data. In other words, merely considering the nominal capital base of a hedge fund strategy may significantly underestimate its real impact. Leverage is therefore an important issue in any assessment of how hedge funds affect overall market conditions.

6 Leverage

In the aftermath of the 1998 LTCM crisis, the use of leverage by hedge funds was one of the central points in a wide range of industry and policy discussions.¹³ The basic premise was a simple one: The use of leverage is an important investment tool for hedge funds in their quest to generate absolute returns commensurate with their fee structure. At the same time, leverage can magnify market risk, credit risk and liquidity risk.¹⁴

Given the rapid growth of the hedge fund industry, a natural focal point is the nature of the relationship between record industry inflows, diminishing returns and the potential use of excessive leverage. The basic argument is a simple one: Elevated hedge fund investment returns in the past have tended to attract a large number of new entrants into the hedge fund industry. Increasingly, these new entrants and their activities tend to eliminate market inefficiencies which had accounted for the past high returns. With diminished returns, hedge funds are finding it increasingly difficult to justify their elevated fee structure. In an attempt to preserve returns commensurate with their fees, hedge fund managers might be driven to resort to increasingly elevated levels of leverage.

The data on flows and returns suggest that at least some components of such dynamics are currently at work. Record inflows to the hedge fund industry during the first quarter of 2004 have indeed been followed by unsatisfactory performances throughout most of the hedge fund industry during the second quarter of 2004. Leverage figures are much harder to assemble and interpret than flows and performance data. A recent study of the Bank of England concludes that overall leverage in the hedge fund industry has not markedly increased and remains moderate compared with the 1997–1998 period.¹⁵ Various market sources and data services provide similar assessments of the degree of leverage currently deployed in the hedge fund industry.¹⁶ On balance, however, it is not particularly useful to put too much stock in such cursory assessments of industry leverage. First, the data aggregation problem is significant. Second, leverage can evolve greatly over time. Third, and perhaps most importantly, there are different forms of leverage, some of which are unlikely to be captured reliably by any aggregate industry data. Thus, it is more the type, level and dynamic character of leverage that matters.

13 See US President's Working Group on Financial Markets (1999); Counterparty Risk Management Policy Group (1999); Financial Stability Forum (2000); Managed Futures Association (2003).

14 Managed Futures Association (2003, p. 19).

15 Bank of England (2004).

16 According to Van Hedge Fund Advisors, the strategies with the highest leverage were fixed income arbitrage, convertible arbitrage and global macro, whereas short selling had the lowest leverage. Asset weighted leverage estimates of the different strategies ranged from 1.1 to 8.3.

The most basic form of leverage pertains to financial intermediaries (typically global investment banks) extending credit facilities to hedge funds to allow them to invest capital in excess of their own capital base. Such credit facilities are usually at the root of industry-wide or strategy-specific estimates of leverage in the hedge fund industry. Much of the regulatory discussion following the collapse of LTCM focused on this type of leverage and attempted to strengthen the relationship between financial intermediaries and hedge funds in order to improve counterparty risk management.

A second, more recent form of leverage in the hedge fund industry is related to the rapidly growing funds of funds industry. A number of fund of funds managers have begun to leverage their products by either using their own balance sheet (in the case of large banks or insurance companies) or, alternatively, using credit facilities from other financial firms with large balance sheets. 2:1 leverage ratios are typical, although in some cases, leverage ratios can be as high as 4:1. This form of leverage, though probably still limited, is unlikely to be captured by any industry leverage figures which are based on individual hedge funds.

Finally, the most complex form of leverage that hedge funds employ is instrument leverage. This type of leverage is embedded in the use of most kinds of derivative instruments. Extreme leverage of this type could conceivably have systemic repercussions.

The hedge fund industry and the investment banks trading with hedge funds do not calculate and apply the leverage concept in the form it is traditionally used (i.e. the value of positions as a multiple of equity). Hedge funds define a target value at risk (VaR) or capital allocation to each position. Similarly, investment banks trading with hedge funds control the risks involved with the hedge funds by allocating to the fund a VaR limit. All open positions to the fund – mainly derivatives like futures, swaps, swaptions or forwards – are taken into account in the VaR limit, with all offsetting positions usually netted out. The size of the total position the hedge fund can build is a function of the variables that determine the VaR – e.g. the volatilities and correlations of the returns of the different instruments. As a measure of risk control the VaR of the fund has to be covered with margins, mostly in the form of securities. Generally speaking the investment banks apply the well-known margin system of futures exchanges to the overall business with hedge funds. There are additional safety procedures. For example, as a result of a large draw

down in the net asset value, the VaR limit can be reduced automatically, forcing the fund to reduce or close out its positions.

Nonetheless, it should be kept in mind that VaR measures have limitations – they reflect price behaviour in normal markets and are not well suited to a stressed market environment. It is possible that the reliance of institutions on VaR could introduce feedback effects. There is some anecdotal evidence, for example, which suggests that institutions are selling options in order to boost returns. On the one hand, this is contributing to the smooth functioning of financial markets. On the other hand, these options sales reduce the price of volatility, which leads to a decrease in VaR estimates. Thus institutions may have access to greater leverage than would apply in time of more “normal” volatility levels.

17 See Counterparty Risk Management Policy Group (1999).

7 Regulation

There has been a noticeable increase in calls for additional regulatory oversight of hedge funds. Prior to engaging in a regulatory discussion, it is important to recognize two aspects: First, hedge funds are already subject to a wide range of indirect regulations. They operate in regulated financial markets; they utilize the infrastructure of regulated financial centres and – more importantly – they deal with regulated financial institutions. Second, many hedge funds are already subject to direct regulatory requirements. According to a recent informal survey by one of the world's leading fund of funds operators, amongst their 220 invested funds, 58% were registered with the US National Futures Association (NFA), 36% with the US Securities Exchange Commission (SEC), 30% with the UK Financial Services Authority (FSA) and 1% with the CFTC.¹⁸

As far as the necessity for further direct regulation goes, it is useful to distinguish between three different potential regulatory arenas: prudential matters, position reporting, and leverage. Prudential regulation is concerned with the commendable goal of eliminating fraud. As noted above, many hedge funds are already subject to registration with regulatory authorities, which is part of this effort. Indeed, there is probably some need to avoid regulatory overlap and clarify responsibilities between different regulatory agencies. Efforts undertaken by the FSA in London to ensure proper business structures as well as control and pricing processes have arguably diminished the fraud risks in the industry. For many institutional investors, registration appears to have become an important criterion in selecting hedge funds

Regulatory initiatives in the arena of position reporting are, at best, an unrealistic proposition. At worst, it could undermine the integrity of financial markets. It is unrealistic because the timeliness and aggregation problems are virtually insurmountable in an industry which today represents nearly 12% of the total mutual funds industry in the United States. More importantly, it is potentially counterproductive because, amongst other things, position leaks could encourage behaviour by market participants which is fundamentally incompatible with a market-based price finding mechanism.

The most complex potential regulatory arena concerns leverage in the hedge fund industry. Extreme levels of leverage are an obvious source of concern for central banks in light of the credit risk nexus of hedge funds and the global banking system. This credit risk nexus could become particularly precarious if a large scale credit crisis were to coincide with a global capital market liquidity crisis. In light of this nexus, there is probably some validity to calls for further examination of the degree of leverage in the hedge fund industry, or at least the measurement methods deployed to assess leverage. But as noted above, there are vast aggregation problems, not dissimilar to those in the arena of position reporting, so expectations about what can be achieved need to be realistic. Mis-directed regulatory initiatives run the risk of being unable to accomplish what they set out to do. Nonetheless, the question of leverage in the hedge fund industry deserves further study.

Ultimately, the most critical point is likely to be situated in the risk management operations of the world's leading counterparties of the hedge fund industry. If the leading global investment banks maintain adequate counterparty risk and liquidity risk management systems and operations, leverage in the hedge fund industry should only represent a marginal risk to the stability of the global financial system. Therefore, further efforts to examine the question of leverage in the hedge fund industry should be directed primarily at the risk management operations and processes of the world's major investment banks. They are the primary trading partners of the hedge fund industry. They are also the most important providers of leverage to the industry. Fortunately, the global investment banking community is a small and concentrated one. This should facilitate further study of whether risk management systems and processes within the world's most important financial institutions adequately capture the risk taking of individual hedge funds.

¹⁸ In a recent speech in November 2004, a director of the SEC estimated that 40 to 50 percent of hedge fund advisers were voluntarily registered with SEC.

8 Conclusions

The hedge fund industry has undergone important changes since the LTCM crisis in 1998. Assets under management and the number of active funds have risen sharply, though the global hedge fund industry represented only 1.1% of the total capitalization of world bond and equity markets at the end of 2003. One important factor in the growth dynamic of the industry has been the growing demand for hedge fund investments from a wide range of institutional investors. Capital inflows have varied depending on the different hedge fund strategies.

Free of narrow constraints embedded in traditional investment guidelines, hedge funds have been an important source of innovation in the asset management industry. Moreover, hedge funds have rendered financial markets more liquid, more efficient and, ultimately, more flexible. Overall, the increased significance of the industry has not been accompanied by a clear change in market volatility. Nonetheless, the most recent rapid growth of both the number of hedge funds and their assets under management coincides with a dramatic reduction in market volatility. At the same time, market observation suggests that in some specific cases, certain segments of the hedge fund industry may have adversely impacted market volatility, either by accentuating existing market trends or by causing sharp price reversals or gapping price movements.

The use of leverage is a central characteristic of the hedge fund industry. Overall industry leverage is extremely difficult to measure. Market and survey evidence suggests that leverage is currently moderate. However, such leverage estimates must be interpreted with great caution as they are unlikely to capture the real extent of leverage embedded in the hedge fund industry. Leverage matters in a number of ways. One particular concern is that diminishing hedge fund returns in the aftermath of large capital inflows might motivate hedge fund managers to use extreme leverage to generate returns commensurate with the prevailing hedge fund fee structure. Systemic risks could conceivably result from such elevated levels of financial leverage, primarily through large credit risk transfers to the global banking system.

Ultimately, leverage, combined with inept asset management strategies, leads to hedge fund failures. These are likely to occur in the future as they have in the past. It is not inconceivable that expansionary monetary policy and the resulting global liquidity boost provide fertile grounds for the rise and fall of hedge funds. In the event of hedge fund failures, investors – for the most part wealthy individuals – will lose money. Nonetheless, such capital losses have no bearing on the stability of the financial system and should be of no concern to policy makers. What financial and economic policy makers must be concerned with are hedge fund failures or hedge fund activities that undermine the stability of the global financial system. Prudent and disciplined risk management methods, operations and processes in the global investment banks provide the most reliable defence against an erosion of lending standards and the potentially hazardous consequences of the use of excessive leverage in the hedge fund industry. Further study should be directed accordingly.

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