

# Highwaymen or Heroes: Should Hedge Funds be Regulated?\*

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Revised Version. November 2004

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## Summary

Our objective was to study the need for regulating hedge funds, using existing regulatory approaches and our own models as a frame of reference. Our questions include: Should hedge funds remain unregulated? Should potential regulation of hedge funds fall within the present regulatory structure, or do we need new approaches to effectively regulate hedge funds, and if so what would those approaches be?

Existing studies have highlighted the broad benefits that hedge funds can provide to the financial system in terms of diversification, competition and price discovery. Our models emphasise the extremely valuable role that hedge funds, as unregulated institutions, can play in alleviating liquidity problems. Suppose all financial institutions were regulated, and the economy suffers a significant shock leading to a liquidity crisis. In this case the regulated institutions may be prevented from engaging in essential trading activity for regulatory reasons, perversely exasperating the crisis. Unregulated financial institutions, such as hedge funds, are not so restricted and will see a benefit in trading, thus helping to contain the crisis.

Despite these potential benefits of hedge fund activities, there are compelling reasons why some form of regulation of hedge funds is necessary. In particular, we would highlight that there is a real potential that the collapse of a large hedge fund may trigger a systemic crisis episode, carrying with it significant economic costs. Furthermore, whilst such a collapse may break the current impasse in the regulatory debate it is likely to lead to a knee-jerk reaction by the public and politicians, forcing the implementation of inefficient and overbearing regulations. By contrast we find arguments for regulating hedge funds directly for reasons of consumer protection unconvincing.

Unfortunately, most discussion on the regulation of hedge funds proposes to fit hedge funds within the existing regulatory structure (disclosure and activity restrictions), and fails to address the unique nature of hedge funds. We argue that such regulations are inappropriate, and would either be ineffective or cause an irrevocable harm to the hedge fund industry, impeding their ability to deliver wider market benefits.

The systemic risk from hedge funds stems from the aftermath of a large funds collapse, not the ongoing regular trading activities of solvent funds. Therefore regulations should aim at containing the fallout from any such default so as to minimise market disruption. At the same time, regulations should not hinder the benefits associated with funds regular operations.

We suggest that this can most effectively be implemented by instituting a formal resolution process whereby the regulator, prime brokers, and client banks all have the legal obligation to ensure that the fund be unwound as quickly as possible. Clearly, such an organized resolution process must not be confused with a bailout, and no public funds must be used.

# Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
<b>2</b>	<b>The Regulatory Debate</b>	<b>7</b>
2.1	The Legal Environment . . . . .	7
2.2	Approaches to Regulation . . . . .	8
<b>3</b>	<b>Perceived Costs and Benefits of Hedge Funds</b>	<b>9</b>
3.1	Costs Attributed to Hedge Funds . . . . .	10
3.1.1	“Hedge Funds are Destabilizing” . . . . .	10
3.1.2	“Hedge Funds are Overly Levered” . . . . .	11
3.1.3	“Hedge Funds Constitute Counterparty Risk” . . . . .	12
3.1.4	“Hedge Funds Herd” . . . . .	13
3.1.5	“Hedge Funds use up Market Liquidity” . . . . .	15
3.1.6	“Hedge Funds are Prone to Commit Fraud” . . . . .	15
3.2	The Benefits Attributed to Hedge Funds . . . . .	16
3.2.1	“Hedge Funds Aid Price Discovery” . . . . .	16
3.2.2	“Hedge Funds Aid Competition and the Invisible Hand”	16
3.2.3	“Hedge Funds Provide Diversification” . . . . .	17
3.2.4	“Hedge Funds Aid Market Clearing and Provide Liquidity” . . . . .	18
<b>4</b>	<b>Application of Existing Regulatory Methodology to Hedge Funds – Appropriate, Sufficient or Desirable?</b>	<b>19</b>
4.1	Disclosure . . . . .	19
4.1.1	Disclosure of Summary Statistics of Aggregate Exposures	20
4.1.2	Detailed disclosures . . . . .	21
4.2	Prescriptive Activity Restrictions . . . . .	23
<b>5</b>	<b>Proposals: Focusing on Systemic Events</b>	<b>24</b>

# 1 Introduction

Hedge funds occupy a unique place as the only financial institutions exempted from most prudential regulation. When hedge funds remained niche players, their special regulatory status raised few concerns. However, in recent years assets under management by hedge funds have grown exponentially<sup>1</sup> and so have worries about their impact on the financial system, prompted by the role of hedge funds in the major financial crisis episodes of the 1990s such as the ERM, Asian, and LTCM crises. More recently, alleged cases of fraudulent behavior have added further, micro-prudential concerns.

These events precipitated a heated debate about the regulatory status of hedge funds and a number of wide-ranging national and supra-national regulatory reviews.<sup>2</sup> The debate has been further fuelled by the conspicuous exclusion of hedge funds from the Basel-II process. Much of this debate has focused on a narrow range of arguments, leading to extreme conclusions: either fully regulate hedge funds like other financial institutions, or leave them unregulated. A more nuanced analysis of the pros and cons of hedge funds is likely to reject these extreme views and prescriptions for public policy reform ought to reflect a balanced analysis of the whole spectrum of views.

Our objective is to identify the key economic reasons for and against regulating hedge funds, and consider the potential optimal form of regulation. The arguments in favor of regulating hedge funds focus both on consumer protection and financial stability. So long as hedge fund clients are either wealthy investors or regulated institutions, the tangible benefits from directly regulating hedge funds for consumer protection reasons appear limited. Wealthy investors neither need nor want specific micro-prudential protection, and investments by regulated institutions, such as pension funds, banks, and insurance companies, are best regulated by their own supervisors (regulating the demand side rather than the supply side of hedge fund products). Financial stability reasons for regulating hedge funds, which are the main focus of

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<sup>1</sup>Reaching \$1.160 bn, in May 2004, and representing more than 8000 hedge funds and 10% of all assets managed by the US mutual funds industry. Data from Alternative Fund Services Review, an industry publication, and Correctnet, a data management company (FT May 15, 2004).

<sup>2</sup>Whilst regulators had followed the growth of hedge funds in previous decades with interest, for example, as far back as a 1969 SEC investigative study, the crises of the 1990s led to major investigations by the President's Working Group on Financial Markets (1999), the Basel Committee on Banking Supervision (1999) and the Financial Stability Forum (2000). These reports examined the LTCM failure in great detail, producing a raft of recommendations. More recently the SEC (2003b) has concluded a major review of hedge funds activity.

this paper, are more convincing, particularly since a single hedge fund collapse has the potential to trigger a systemic crisis, as nearly happened with LTCM. However, the case for not regulating hedge funds is also compelling, since hedge funds bring clear benefits to the financial system by improving efficiency, price discovery, and consumer choice.

To date this debate has not led to any substantive changes in the regulation of hedge funds themselves.<sup>3</sup> Nevertheless, if another hedge fund crisis were to occur this clearly could provide the impetus for major reform. There is a real concern that the political pressure in such a situation would be so strong that regulators will be forced to implement overbearing and suboptimal solutions, as happened following the 1929 crash. Prior analysis of the costs and benefits of different forms of regulation can play a role in helping to guard against such an outcome.

Traditional regulatory techniques, such as activity restrictions and disclosure are likely to be ineffective for the macro-prudential regulation of hedge funds, partly because since hedge funds are nimble enough to move their operations elsewhere, and not least since hedge funds specialize in the most advanced uses of proprietary financial technology. It is hard to see how even the most sophisticated regulator can comprehend all the models in active use, draw firm conclusions from those models, and issue effective guidelines based on those conclusions. Instead, they are more likely to resort to blunt regulatory instruments, which may unduly hinder the regular operation of hedge funds without much benefit.

In fact, in contrast to other financial firms whose actions lead to calls for regulation, hedge funds are quite unique. Regulation is typically called for when the decisions of firms cause significant net costs to third parties. An example is misselling of pensions which has some private benefits to the vendors, at the expense not only of their clients, but also undermining public faith in private pensions provisions. Hedge funds, however, do not fit into this mold. Whilst their activities can impose negative costs on the economy in a default, they also provide positive benefits, such as more efficient and liquid markets. This simultaneous provision of negative and positive externalities from hedge fund activities means that using traditional regulatory techniques to eliminate the former may destroy the latter — Killing the geese, including the geese that lay the golden eggs.

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<sup>3</sup>Although, based upon the SEC (2003b) report and the formal proposal (SEC, 2004), at an open meeting on Oct. 26, 2004 the SEC voted to adopt Rule 203(b)(3)-2 that requires hedge fund advisors to register with the Commission under the Investment Advisers Act of 1940 by Feb. 1, 2006.

Addressing financial stability concerns whilst at the same time preserving the benefits of hedge funds therefore requires a new regulatory approach. The extremely large potential downside from a systemic crisis, however remote the possibility, strongly suggests that a central feature of any such approach should be its ability to deal with the potential fallout from the failure of a major hedge fund (there were about eight hundred hedge fund failures in 2003, up from seven hundred in 2002, but none of them significantly affected the market). The resolution process instigated by the New York Fed following the collapse of LTCM in 1998 provides one example of such a mechanism. When the New York Fed learned of the pending collapse of LTCM and the potential systemic implications, they brought together all the key client banks, including prime brokers, and encouraged them to implement an orderly winding down process for LTCM's positions with the aim of providing the least amount of disruption to markets. An important part of this process was that no public funds were used, with the Fed's role limited to managing the process. While in this case Fed was able to use persuasion to resolve the crisis, what if the client banks had resisted more strongly, the Fed had been less determined or less persuasive, or the whole process had become politicized and bogged down?

It is crucial to ensure that any future failure of a systemically important hedge fund be accompanied by a successful resolution process. One option is for a formal resolution mechanism to be adopted for such cases. While the procedural issues are complex, they do not appear insurmountable. For example, it could be that the relevant supervisors should have the duty and power to start and carry through the resolution process, with a hedge fund in difficulty, its prime broker(s), and other client banks obliged to alert the supervisor if they suspect problems. Furthermore, as a guiding principle it is important that client banks and the prime broker bear the whole cost of this process, and under no circumstances should public funds be contributed given the moral hazard they could induce. The details of such a mechanism and its incentive effects clearly require further analysis but hopefully this proposal serves to focus the debate on what appears to be a prime motivation for any reform.

## 2 The Regulatory Debate

### 2.1 The Legal Environment

The special status of hedge funds is rooted in particular exemptions from the securities laws of the US, and some other countries, provided the only investors in a fund are few in number (less than 100) and *accredited*, i.e. sufficiently sophisticated and wealthy, and for investments only to be offered in private placements excluding public advertisement and marketing. Meeting these criteria frees up hedge funds from constraints on investment activities, governance and transparency.<sup>4</sup> These laws were originally designed with consumer protection in mind, and it was felt that accredited investors should not be legally forced to be protected from fraud and abuse by the securities industry.<sup>5</sup> Other countries, like the UK, have similar laws, but not all jurisdictions provide the necessary exemptions to allow for the operation of hedge funds.

If investors find the domestic legal requirements too restrictive they may opt for hedge funds domiciled offshore, for example in Luxembourg and Ireland for European investors or in the Caribbean for US investors. These jurisdictions have advantages in terms of disclosure, and allowable activities, but the main benefit in offshore investing relates to taxation. However, since most clients are onshore, the management companies, or advisors, of those offshore investment vehicles are mostly onshore in the major financial centers and possess the delegated powers to trade on the fund's behalf. In the US, they can choose to be registered with the SEC, and there are calls for registration to be mandated, as proposed by the SEC in July 2004.<sup>6</sup> Currently around 50% of hedge fund managers are not registered under the 'Investment Advisers Act' of 1940. In much of Europe (including the UK as a major center) registration is compulsory.

Even if the fund itself or its advisors are unregulated they do not operate in a regulatory vacuum – they trade on regulated exchanges and deal and interact with other regulated institutions. Hedge funds outsource most activ-

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<sup>4</sup>For example, regulated funds which do not fall under these exemptions face restrictions on leverage, diversification, choice of securities, activities between affiliates, disclosure, governance, redemption, transparency, and registration. For country details see, for example, SEC (2003b) for the US, Financial Services Authority (2002) for the UK and Lhabitant (2002) for various other jurisdictions. For further background see Connor and Woo (2004).

<sup>5</sup>Furthermore, legal exemptions allow for *funds of funds*, i.e., funds that do not trade on their own account, but instead invest in other hedge funds.

<sup>6</sup>See SEC (2004).

ities except trading decisions (for example, execution, settlements, clearing, leverage, risk management, etc.) to *prime brokers* which generally are major investment banks.<sup>7</sup> Because the prime brokers are regulated, their hedge fund business indirectly falls under supervisory oversight. For example, in the UK, the FSA<sup>8</sup> is holding meetings with prime brokers over their links with hedge funds in order to assess the extent of due diligence and risk management, presumably partly with a view of using prime brokers as early warning signs of any risk to the financial stability posed or believed to be posed by hedge funds.

## 2.2 Approaches to Regulation

The involvement of hedge funds in major financial crises of the 1990s on the one hand and the substantial benefits that have accrued to their owners and investors on the other, have resulted in a very polarized debate about the regulatory status of hedge funds. Inevitably, a wide range of proposals has been made, spanning the spectrum from banning hedge funds altogether to preserving the status quo. The large number of distinct proposals regarding hedge fund regulation can be distilled into four main viewpoints.

**Regulate everything** At one extreme is the view that hedge funds should be regulated in the same manner as other financial institutions. This sometimes reflects a desire for a fair and equal treatment of all financial institutions, or perhaps a generic public distrust of markets. However, for supervisors a desire to fully regulate hedge funds may be due to *political risk aversion* manifesting as a ‘fear of the unknown’, since they generally are exposed to considerable political downside risk when something adverse happens, with little political upside when markets are functioning smoothly. The relative importance of these characteristics varies by country and is likely to depend on the maturity of the country’s financial markets. For example, the political downside may be greater in countries with a traditional culture of heavily regulated markets as opposed to countries such as the UK and US which have long enjoyed considerable benefits of their extensive and lightly regulated financial markets.

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<sup>7</sup>Most hedge funds only deal with one prime broker, while some might use more. Tremont estimates that through November 2003, Morgan Stanley, Goldman Sachs and Bear Stearns had a 79% of the prime broker market.

<sup>8</sup>As reported in the Financial Times (2004a)



**Laissez-faire** At the other extreme is the view that hedge funds should not be regulated at all because of the efficiency they provide to the financial system. This view is perhaps most notably associated with US Federal Reserve Board Chairman Alan Greenspan.<sup>9</sup> This has also become the default option in the Basel-II negotiations but for a different reason as the various members of the Basel Committee have not been able to come to an agreement on how hedge funds could be incorporated in the Basel-II process.

**Micro-prudential** The opaque nature of most hedge funds makes it harder for investors to verify hedge fund valuations, giving rise to the potential for fraudulent behavior. Recent mispricing scandals have led to calls for increased quality, and auditing of, hedge funds disclosures. For example, the absence of an independent check on hedge fund advisors' asset valuations was one of the most serious concerns of the recent SEC report (p.79 SEC, 2003b), whilst popular media, such as Business Week (2004), have also called for mandated third party auditing of valuations. Most recent calls for hedge fund regulation have been for such micro-prudential reasons.

**Macro-prudential** The strongest and most convincing calls for hedge fund regulation relate to financial stability. Hedge fund activities in the ERM crisis, the Asian crisis, the Yen crisis of 1998, and most significantly the LTCM liquidity crisis, are the focal point of the discussion. The primary concern is the potential for hedge funds to trigger or exacerbate liquidity crises, increasing counterparty risk and ultimately leading to domino style defaults in the financial system.

### 3 Perceived Costs and Benefits of Hedge Funds

Behind the different viewpoints on hedge fund regulation, lie differing assessments of the possible costs of their activities and the benefits they can provide. As often is the case with regulation, the externalities justifying hedge fund regulation are superficially more visible than the benefits from

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<sup>9</sup>See, for example, Testimony of Alan Greenspan, Chairman of the Board of Governors of the Federal Reserve, Before the House Committee on Banking and Financial Services (Oct. 1, 1998) (Greenspan (1998)): "If, somehow, hedge funds were barred worldwide, the American financial system would lose the benefits conveyed by their efforts, including arbitraging price differentials away. The resulting loss in efficiency and contribution to financial value added and the nation's standard of living would be a high price to pay—to my mind, too high a price."

not regulating. It is easy to point to well-publicized cases where hedge funds may have been destabilizing, while the efficiency they bring to the financial markets is less visible, since smoothly functioning markets are often taken for granted.

## **3.1 Costs Attributed to Hedge Funds**

### **3.1.1 “Hedge Funds are Destabilizing”**

Hedge funds are frequently accused of destabilizing the international financial system. This is especially true for macro funds, which take large positions on the long-term direction of macroeconomic developments. While a hedge fund’s interest in a country may not be to the governments liking, this does not mean that the hedge fund is necessarily predatory or destabilizing. It may simply be exploiting the difference between the real state of the economy and market prices. In this case, the hedge fund would be beneficial to the economy by eliminating the mispricing.

The available empirical evidence on whether hedge funds are destabilizing is mixed. Hedge funds are considered to have exerted a significant market impact during the ERM crisis (see e.g. Fung and Hsieh, 2000), but not during the Asian crisis (see e.g. Choe et al., 1998; Fung and Hsieh, 2000; Fung et al., 2000; Goetzmann et al., 2000). Indeed, during the Asian crisis, foreign hedge funds seem to have had a stronger belief in the economy of the crisis countries than domestic investors. They supported the domestic currencies of those countries, while the rapid currency depreciations were caused by better informed domestic corporations, contradicting the convenient “Mahatir Conjecture.”

Nevertheless, the evidence, hampered by data and methodological limitations, remains inconclusive. For example, in their comments on Fung et al. (2000), Edwards and Caglayan (2001) note the data problems relating to the need to consider factors other than changes in Asian currency values which can affect the returns of the hedge funds considered, as well as to the limited number of hedge funds considered. Similarly, the Reserve Bank of Australia (1999) criticizes the methodology of Goetzmann et al. (2000) for assuming that movements in specific currencies over fixed time intervals were the sole source of returns for the hedge funds.

### 3.1.2 “Hedge Funds are Overly Levered”

Leverage (or gearing) refers to the extent to which a financial institution is indebted, usually relative to its capital base. This leverage may be direct through formal debt such as bonds, IOU’s, credit lines and so forth, or indirect through implicit borrowing due to certain derivative operations.<sup>10</sup> This indirect leverage is particularly important for hedge funds given their often significant derivatives positions.

Hedge funds, unlike regulated financial institutions do not have an upper limit on allowable leverage. This leverage is argued to increase both the likelihood and severity of hedge fund defaults, potentially leading to financial crises. Whilst such concerns have long been expressed,<sup>11</sup> they were amplified following the LTCM collapse. At present, hedge funds do not appear to employ very high levels of leverage. In 2003 84% of hedge funds had leverage less than 200% of capital and only 2% used leverage over 500%,<sup>12</sup> Gupta and Liang (2004) find that less than 4% of live and 11% of dead hedge funds in their sample would have violated the Basel-II capital adequacy requirements as of March 2003, with the under-capitalized funds relatively small. Market reports also suggest that leverage has not increased markedly recently and that it remains moderate compared to levels reached in 1997/1998.<sup>13</sup> In addition, the view of excessively levered hedge funds must be contrasted with the leverage of other regulated financial institutions, particularly the banks. Since banks have an 8% capital adequacy ratio, they can in principle be levered more than 12 times. As a consequence, worries about systemic stability due to the potential unlimited hedge fund leverage do not seem to be supported by the available facts.<sup>14</sup> Extreme hedge fund leverage in crises is a symptom, not the cause of the crisis event.

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<sup>10</sup>For instance, being long a call option is effectively equivalent to being long a certain number of stocks (the “delta”), financed in part by borrowing cash.

<sup>11</sup>For example, in the 1992 Joint Report on the (US) Government Securities Market.

<sup>12</sup>Hennessee Group (2003).

<sup>13</sup>See Bank of England (2004), p.53, who also note that 1997/98 may not be an appropriate benchmark.

<sup>14</sup>This viewpoint is made strongly by the Financial Economists Roundtable (1999) response to the President’s working group report on LTCM: the “emphasis on excessive leverage as a systemic concern is unsupported. It fails to make a case that excessive leverage is a systemic concern, that private markets fail to constrain hedge fund leverage adequately, and that additional regulatory steps are needed to assure that in the future hedge fund leverage will not be excessive. Even assuming that a case can be made (which the Report does not make) that excessive leverage was the primary culprit in the LTCM collapse, this single event cannot by itself be the basis for the claim that leverage is in general excessive in either the hedge fund industry or the financial system as a whole”.

In addition, by its very nature, leverage is difficult to measure. It clearly cannot be easily captured by enforced disclosure of direct exposures, since issues such as pricing and aggregation of exposures are very complex. It is also not obvious how such information could be communicated in an informative manner to the supervisors who would have to retain sufficient expertise to analyze the disclosure of every hedge fund. Furthermore, such information would likely be of limited value, even if it allowed supervisors to draw the right conclusions, as it would be extremely sensitive to the potentially rapid changes in the value of derivatives positions and capital values, particularly in times of crises. As a consequence it seems impossible to measure the contribution of leverage to systemic risk with any degree of accuracy. In addition, while a hedge fund crisis might be coupled with extreme levels of leverage, as in the case of LTCM, it is important to note that extreme leverage is primarily due to an erosion of a hedge fund capital base, not an increase in overall speculative positions. Therefore, even if we could measure leverage, it might not be a very useful early warning signal, as extremely high leverage is likely to be correlated with crises, rather than predictive of crises.

### 3.1.3 “Hedge Funds Constitute Counterparty Risk”

Since hedge funds are unencumbered by mandated leverage restrictions, with primary activities focussed on relatively high risk trading, hedge fund defaults may be more likely and more damaging than in the case of regulated financial institutions. Essentially, hedge funds cause *counterparty risk* for regulated trading partners (such as prime brokers) and investors, thus increasing credit risk in the regulated part of the financial system.

Counterparty risk was an important issue in the LTCM crisis, where a key concern was the high exposure of major investment banks to LTCM settlement risk, and a lack of information about overall exposures. Because of network linkages of their inter-bank exposures, both LTCM creditor banks, and financial institutions with no direct connection to LTCM were exposed to indirect counterparty risk. The main worry in such networks is the triggering of domino style defaults throughout the banking system.<sup>15</sup> The importance for financial stability is hard to ascertain, however, as little empirical evidence has been provided to address this point.

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<sup>15</sup>These issues are discussed on a theoretical level by Allen and Gale (2000) and Cifuentes et al. (2003) who study the network structure put in place by the balance sheet counterparty relationships among financial market participants that can contribute to and amplify the risk of financial instability.

As a result of the LTCM crisis, the improvement of counterparty risk management became a key focus of the Financial Stability Forum (2000) and the Basel Committee on Banking Supervision (1999) reports, with prime brokers keeping much closer eyes on client hedge fund positions and liquidity. One approach suggested to minimize counterparty risk is to adopt continuous settlement, mark-to-market, and margins, which certainly can help in containing counterparty risk. Unfortunately, continuous settlement can also contribute to market instability.<sup>16</sup> Consider a hedge fund which has a superior pricing model used to implement an arbitrage strategy. The favorable outcome of this strategy relies on both the long position in the cheap asset and the short position in the expensive asset being held to maturity where they offset each other, giving the fund immediate arbitrage profits. However, if the shorted asset appreciates sharply and is marked-to-market then this may trigger margin calls and a potential liquidity problem for the fund. A fire-sale of the arbitrage portfolio may be necessary, leading to potential losses, and even default of the entire fund, despite the initial absence of default risk at maturity.<sup>17</sup> In this case marking-to-market causes the default rather than preventing the default. Since traders know this risk ex-ante, they will not attempt to fully correct the mispricings, leading to market inefficiencies.

### 3.1.4 “Hedge Funds Herd”

Hedge funds are often accused of herding, with the ERM and Asian currency crises cited as prime examples. The academic notion of herding (see e.g. Avery and Zemski, 1998) refers to the phenomenon by which funds mimic other funds, despite the fact that their private information or proprietary model suggests other strategies. In common parlance, herding is more general, involving hedge funds mimicking other funds in implementing trading strategies, for example attacking specific currencies.

Is herding by hedge funds likely? Their strategies are unencumbered by mandates, and hence they are much more flexible in implementing new trading strategies or investing in new assets or markets, as well as putting on shorts. If flexibility and innovation are the *raison d'être* for hedge funds, one might expect hedge funds to be less likely to herd than other institutions. This does not prevent them from putting on the same trades roughly at the same time. In addition, for a hedge fund to develop costly proprietary trading

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<sup>16</sup>This point has for instance been made in various guises by De Long et al. (1990) or Shleifer and Vishny (1997).

<sup>17</sup>This is similar to what happened with Metallgesellschaft in 1993.

models and then ignore the model in favor of herding puts it at a distinct disadvantage to a lower cost copycat fund.<sup>18</sup>

For some hedge fund types, it is natural to have similar positions. For instance, convertible or merger arbitrage hedge funds tend to put on similar trades by the very nature of their strategies – this does not constitute herding any more than holding the market portfolio can be called herding. It is also possible that the remuneration schemes for hedge fund managers encourages less herding compared to their mutual fund counterparts if it is the case that the mutual fund managers' pay is more explicitly linked to the benchmarking of fund performance. Chevalier and Ellison (1999) show empirically that career concerns imply that mutual fund managers tend to herd and to not take on much nonsystematic risk.

The empirical evidence on herding by hedge funds is mixed. In some cases the evidence is relatively clear, for example as in the ERM crisis (Fung and Hsieh, 2000), whilst in other episodes there is less evidence. Liang (2004) argues that there may be some evidence of herding in down markets. In such markets, hedge funds are compelled to put on more similar trades, which in turn affects liquidity negatively and feeds back into the correlation structure.

Whilst most mispricings exploited by hedge funds have a more or less known reversion or resolution time, bubbles are open ended by definition. This open-endedness and lack of common knowledge implies that it may be worthwhile to ride the bubble for some time before getting out, and even shorting the bubble. This exposure to bubbles might be most pronounced in macro hedge funds.<sup>19</sup>

Hedge funds of course may act as a catalyst, by triggering herding by other investors, but available evidence suggests that this has not been the case. Fung and Hsieh (2000) find indirect evidence that hedge funds were late comers to the trade during the Asian crisis, while Eichengreen and Mathieson (1999) find no evidence that other traders were guided by the positions taken by hedge funds in prior periods. Indeed they argue that the data suggests that hedge funds often act as 'contrarians'.

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<sup>18</sup>Interestingly the Financial Times (2004b) notes that the movement of individuals from investment banks into positions as hedge fund managers could create a potential similarity in trading strategies between former colleagues and also their employers.

<sup>19</sup>See e.g. Abreu and Brunnermeier (2002) or Zigrand (2001b) for more on this issue, especially in relation to information on arbitrage and common knowledge.

### 3.1.5 “Hedge Funds use up Market Liquidity”

Hedge funds are sometimes accused of ‘using up’ valuable liquidity, hence impeding other investors. By liquidity in this context we mean ease of trade (often viewed in terms of the price impact of trades) rather than access to funds. If hedge funds in aggregate are large sellers of an asset or currency this may have a significant price impact and impose a cost so that other investors cannot find a buyer to close their trades at ‘reasonable’ prices. However, it is also likely that hedge funds do exactly the opposite. While the rest of the financial industry, perhaps due to Basel–II risk constraints, are all selling, hedge funds see opportunities and buy, hence providing liquidity and stability, as discussed by Danielsson and Zigrand (2003). Again, the case is inconclusive.

### 3.1.6 “Hedge Funds are Prone to Commit Fraud”

Since hedge funds are not subject to the same disclosure requirements as mutual funds or other financial institutions, the potential for hedge funds to commit fraud is higher. Fraudulent activities include the misappropriation of assets, mispricing, insider trading, the misrepresentation of portfolio performance, inappropriate marketing, the falsification of experience, credentials and past returns and misleading disclosure. Indeed, with the increased retailization of hedge funds, supervisors have expressed growing concerns about consumer protection for hedge fund investors (see e.g. Financial Services Authority, 2002; SEC, 2003b). Furthermore, anecdotal evidence indicates that investors in hedge funds are very much concerned with the same issues. However, there appears to be little evidence indicating that hedge funds or their advisors engage disproportionately in fraudulent activity,<sup>20</sup> regardless of whether they are registered or not. However, the expansion in the client base of hedge funds, e.g. by relaxation of the accreditation criteria (retailization)<sup>21</sup> or allowing regulated institutions, such as pension funds to invest in hedge funds, has led to calls for changes in the regulatory structure of hedge funds.

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<sup>20</sup>Recent CFTC estimates suggest in the last five years hedge funds have accounted for around 2% of SEC and CFTC enforcement actions (SEC, 2003a).

<sup>21</sup>This is happening in a number of jurisdictions, for example in relation to smaller investors in Hong Kong and Germany in particular. For instance, a new law in Germany, Law dated 15.12.03 (the so-called “Investmentmodernisierungsgesetz”) allows retail investors to invest in single hedge–funds as well as in funds-of-funds. The law provides that single hedge funds can only be sold by registered financial advisors, while hedge funds-of-funds can be sold also by non-registered financial advisors.

These views appear misguided. Accredited investors willingly place their money with unregistered hedge funds, fully cognizant of the potential for abuse. If there is any desire by those investors for better auditing, the intensely competitive hedge fund industry will likely provide such services, without any regulatory prompting. The question of regulated institutions, such as pension funds, investing in hedge funds is similarly clear. Ultimately, it is the responsibility of the investing institution's regulator, i.e. such investments should be regulated on the demand side for hedge fund investments (e.g. by pension fund regulators) and not on the supply side (ie by hedge fund regulators). For example, those regulating pension funds have a much better view of how much risk pension funds can assume, and it would be prudent of them only to allow investments into hedge funds who provide audited performance results. No additional hedge fund regulation to address concerns over fraud is needed. Similarly, a relaxation of the criteria for accredited investors (e.g. Hong Kong and Singapore in Asia and Germany, Ireland, Italy, Luxembourg and Switzerland in Europe) could be accompanied by similar micro-prudential restrictions that only apply to those retail investors.

## **3.2 The Benefits Attributed to Hedge Funds**

### **3.2.1 “Hedge Funds Aid Price Discovery”**

In an age where much of the mutual funds industry is either index tracking, passively managed, or following narrow mandates, the comparative advantage of hedge funds is not to track but to be flexible. As a consequence hedge fund trading contributes to price discovery. By acting upon their research, hedge funds affect prices and volumes and reveal some of their private information to the market at large, helping assets move back to fundamental values more quickly. By-and-large, fundamental prices allow market participants to engage in better and more efficient resource allocation.

### **3.2.2 “Hedge Funds Aid Competition and the Invisible Hand”**

The research and trading strategies of a large number of hedge funds are aimed at deriving profits from the perceived *mispricing* of securities. Mispricing between assets arises because market traders do not have costless and immediate access to all publicly available markets, exchanges and information while trading. For example, an option on the S&P-500 index trades in Chicago, while the underlying stocks trade on various exchanges, like NASDAQ and NYSE. If the derivatives price and the underlying stock prices do



not properly reflect each other (e.g. do not satisfy the relevant no–arbitrage relationships), mispricing occurs.

Traders profiting from the resulting arbitrage opportunities induce prices to move towards the *true* price, and hence allow trades to happen that otherwise would not have taken place.<sup>22</sup> Such activities can further aid efficiency by increasing the competitive pressures on market makers or intermediaries, whose bread and butter are the various spreads. To cite the regulator (SEC, 2003b), “The absence of hedge funds from these markets [of innovative financial instruments] could lead to fewer risk management choices and a higher cost of capital.”

These benefits might well be considerable, but due to lack of data we are not aware of any research that has tried to quantify these benefits. Some parallels can be drawn from the academic literature on international economics, see for instance Van Wincoop (1999) or Davis et al. (2001) who quantify the portion of gains from trade that arises from cross-border trade in financial assets. Their estimates vary from 1 and 5% of GDP for developed and developing countries respectively, to a multiple of those fractions. In the case of domestic markets, we suspect the gains from eliminating mispricing could be even larger. Whilst hedge funds do not eliminate all mispricings, they can play an important role, particularly in the markets in which they are most active.

### 3.2.3 “Hedge Funds Provide Diversification”

Traditional fund managers are usually constrained by their mandates in choosing trading strategies, while individual investors are usually constrained both by transaction costs and technological knowhow. Hedge funds are not subject to such constraints and so may provide investment strategies preferred by investors, but otherwise unobtainable.

Considerable empirical and theoretical evidence demonstrates that hedge funds provide investors with risk–return tradeoffs not available from traditional funds (see e.g. Lhabitant, 2002). Kosowski (2002) in an empirical study of mutual fund managers demonstrates that even if active fund managers did not on average outperform an index in a bull market, they suffer less in bear markets, effectively providing lower risk for an equivalent or higher return

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<sup>22</sup>In other words, hedge funds help reduce pricing inefficiencies and allow marginal rates of substitution across the global economy to converge. In classical economic terms, we say that the arbitrageurs provide some of the benefits of the elusive Walrasian auctioneer. For the technical details see Zigrand (1997) or Zigrand (2001a).

than an index. A key reason for this is the flexibility of active managers (which is even greater for hedge fund managers) to alter styles depending on market conditions. This enables them to pick an asset mix whose performance tends to be less sensitive to bear markets. This outperformance is the result of market timing rather than of following a more conservative strategy by which a larger proportion of wealth is invested in less risky securities from the outset.

In addition to providing diversification benefits for their own investors, hedge funds indirectly benefit other investors. Daniélsson and Zigrand (2003) argue that the presence of hedge funds in the market reduces correlation between assets, especially in bear markets, thus benefiting all investors, not only the direct hedge fund investors. This particular benefit of hedge funds has not yet found widespread recognition, and we are not aware of any empirical evaluations.

### **3.2.4 “Hedge Funds Aid Market Clearing and Provide Liquidity”**

Rapid advances in financial technology and data availability, encouraged by Basel-II, have brought advanced trading and risk management techniques within the reach of just about any financial institution and investor. This has resulted in the information available to market participants and their resulting behavior more uniform than at any other time in history. As a consequence *endogenous risk*, as discussed in Daniélsson and Shin (2003) and Daniélsson and Zigrand (2003), is greatly amplified. This phenomenon is especially damaging during financial crises, where highly correlated information and behavior conspire to amplify the severity of financial crises, by leading to a reduction of liquidity at a time when it is needed most. Furthermore, since hedge funds are unencumbered by mandated risk limits and generally operate at the top end of the technological chain, they have the possibility to act countercyclically during a crisis, providing liquidity and reducing volatility. While regulated investors may need to liquidate risky positions for no reason other than regulatory compliance, hedge funds may find it profitable to take the other side of these fire sales, thus providing liquidity. This implies that the presence of unregulated technologically advanced institutions plays a key role in ensuring financial stability, and that regulating hedge funds would actually increase market volatility and decrease liquidity and stability of financial markets. The issue is certainly not settled, neither in theory nor in the data.

## 4 Application of Existing Regulatory Methodology to Hedge Funds – Appropriate, Sufficient or Desirable?

The main challenge in designing a regulatory structure for hedge funds is striking a balance between leaving hedge funds as unencumbered as possible so as to deliver the benefits they offer, while at the same time containing any possible systemic events resulting from a hedge fund induced crash.<sup>23</sup> Supervisors could apply the most important tools in their armory for this purpose: disclosure and activity restrictions. Both of these have been proven successful in day-to-day regulation of the financial system, and it is frequently suggested that they be applied to the regulation of hedge funds. While that might be a sensible proposition if we think of hedge funds as any other financial institution, we have considerable doubts that these tools would be effective in simultaneously preserving the benefits of hedge funds and containing systemic risk. The supervisors instead are more likely to resort to blunt regulatory instruments, which may unduly hinder the regular operation of hedge funds without much benefit. A key worry is that if a major hedge fund crisis occurs, stringent sub-optimal regulations are adopted, as have happened following the 1929 crash. It is important following any crisis episode that the markets recover as quickly as possible, and that hasty or populist laws are not implemented.

### 4.1 Disclosure

Public and private disclosure is integral to current regulatory regimes. Public disclosure provides information to consumers and provides market discipline while private disclosure provides supervisors with a measure of the stability of the institution in question. Disclosure of market risk can be based on summary statistics (e.g. value-at-risk) or position level information. It has been argued that enforced disclosure by larger hedge funds could play a key part in the macro-prudential regulatory mechanism by helping to forewarn and reduce the likelihood of crises should a hedge fund encounter difficulties. For example, such views motivated the so-called Baker Bill reform proposed

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<sup>23</sup>As highlighted previously, the costs of such events appear of an order of magnitude larger than any other costs of hedge fund activities and are thus the focus of discussion in this paper.

in the US in 1999.<sup>24</sup> The key issues on greater disclosures concern its nature, its effectiveness in achieving the macro-prudential objectives and whether such disclosure could rather be achieved through market discipline alone. Here we are not concerned with the micro-prudential rationale for disclosure, which has been discussed above.<sup>25</sup>

#### 4.1.1 Disclosure of Summary Statistics of Aggregate Exposures

Value-at-risk (VaR) has emerged as the key component of financial regulation pertaining to market (trading) risk. It captures potential losses on a trading portfolio, typically the so-called 99% loss, i.e. losses that happen one out of every 100 days, or 2.5 times per year on average. The Basel-I agreement and Basel-II proposals focus on this risk level. VaR does a reasonable job in capturing risk for small homogenous portfolios without derivative or fixed income assets. However, as a portfolio gets larger and more complicated, and especially when risk across asset classes and trading desks is considered or derivative or fixed income assets are introduced, VaR as a risk measure becomes increasingly irrelevant (see e.g. Danielsson, 2002, for more details on this issue). For hedge funds, who usually employ very complicated trading strategies focused on derivatives, while rapidly changing positions and even styles, VaR is of little use. In addition, since the VaR measure is only a quantile of the distribution of profit and loss, it says nothing about the losses that can happen in exceptional circumstances — all it tells us is the losses that can happen in normal circumstances. Thus, since systemic risk is only about exceptional tail events, VaR is not meaningful for systemic risk measurement.

This problem is compounded by the serious flaw inherent in the VaR measure which is that it can easily and legitimately be manipulated by lowering VaR while increasing potential losses.<sup>26</sup> While considerable literature on alterna-

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<sup>24</sup>The Bill, H.R. 2924, "The Hedge Fund Disclosure Act" did not get past the Committee stage in Congress. Its main features were the enforced disclosure of balance sheet information and measures of market risk of the largest 25 hedge funds to the Federal Reserve Board and other regulators.

<sup>25</sup>These would seem to be behind the SEC (2004) recommendation for the registration of most hedge fund managers as Investment Advisors (as recommended by, or as already required in much of Europe) which would imply disclosure on issues such as conflicts arising from side-by-side management of hedge funds and other client accounts and hedge fund advisors' relationships with prime brokers.

<sup>26</sup>See e.g. Ahn et al. (1999) who demonstrate that simple and easily implemented option strategies allow a hedge fund to lower its VaR significantly by taking mass out of the left tail, while at the same time raising losses in the tail by pushing the remaining mass further out. In that sense, riskier outcomes from a systemic point of view do not only fail to be

tive risk measures and better risk measurement techniques has emerged in recent years, we nevertheless believe that current state-of-the-art methods do not allow us to capture the systemic risk component of a hedge fund's position.

#### 4.1.2 Detailed disclosures

If it is not possible to capture the contribution of a hedge fund trading strategy to systemic risk with a simple summary statistic, like VaR, the only avenue open to supervisors is to require detailed position level disclosure, either publicly or privately to supervisors. It is likely that the former would be strenuously resisted by hedge funds while the latter would be resisted by the supervisors. In addition, it is doubtful that such disclosure would be effective.

The flexibility of hedge fund investment strategies, which is their great advantage over other investment classes, fundamentally depends on confidentiality of trading positions. Furthermore, publicly disclosing trade level information is likely to cause front running and to erode private benefits from research. Such disclosure would undermine the ability, and hence incentives, of hedge funds to provide the market efficiency benefits. Public disclosure would most likely be of little benefit since it would have to be assessable by its intended audience. As a practical matter, this means that much of the technical details would have to be left out, effectively implying that the public disclosure would have to take the form of summary statistics, which as discussed above are of limited use.

The alternative is a private disclosure of position level information to the supervisor. Most large and successful hedge funds employ rather complicated pricing models and trading strategies involving complex derivatives. Calculating the risk of one such instrument is usually quite challenging, and calculating the risk of a portfolio of derivative instruments requires technical expertise at the highest (and most expensive) level. This involves an intimate knowledge of the underlying pricing model and positions. For the supervisor this task is compounded by having to aggregate the risk across hedge funds. Effectively, the supervisor would have to run a risk engine that simultaneously encompasses the positions of all hedge funds. Such a task is beyond the limits of existing technology.

If mandatory disclosure to a regulator is the way ahead, the question remains regarding what use information from mandatory disclosure would be put to

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flagged by the VaR number, they go hand-in-hand with a lower VaR!

by the regulator. For example, in the special case of LTCM, it could be argued on one hand that knowledge of the positions could have enabled the regulator to inform its counterparties and thus prevented the build up of such large leverage. On the other hand there was a rapid build up in leverage which may not have been captured by regulatory disclosure given time lags since the extreme leverage only occurred after the crisis was underway. Ultimately, the manner of its intervention is of crucial importance, rather than the disclosure mechanism.

The regulators themselves are likely to be reluctant to require detailed private disclosure, because of future political implications of its interventions or lack of interventions. In the event of future problems relating to hedge fund activity, regulators are exposed to an ex-post criticism that they had the information and should have prevented the problem. And alternatively, for supervisors to take action erroneously is also problematic. Essentially, the fear of *type I error* which occurs when a regulator acts but shouldn't have, and *type II error* which occurs when a regulator fails to take action, but should have, is of considerable importance to supervisors. The nature of politics induces the regulator to minimize type II errors at the expense of type I errors.

There is, however, an alternative mechanism for using private information about hedge fund positions for the purpose of measuring systemic risk, i.e. via prime brokers. They observe the whole trading activity of client hedge funds, and often run its risk engines. Given their involvement in counterparty risk, they have a strong incentive to monitor fund exposures closely. Such continuous monitoring can provide early warning signs for systemic risk. While this is essentially a market solution, supervisors, who already regulate the prime brokers, could require that prime brokers fulfill such a function. Following LTCM, prime brokers have become much more concerned about counterparty risk, and tend to require full position level and loan disclosure in the case a hedge fund uses more than one prime broker. The reason is that excessive concentration of positions is, in conjunction with the directional nature of some bets, as well as illiquidity, the major reason for a hedge fund demise. Prime brokers thereby play a role as risk managers and can use their power to recall short-term credit lent to the hedge funds in order to impose acceptable levels of risk taking. This latter ability can potentially give prime brokers much more power than banks have over their regular borrowers. However, there are also factors which could weaken the incentive of prime brokers to play such a disciplining role, for example the competitive pressures for mandates from hedge funds.

While those regulatory monitoring and disclosure burdens imposed upon

prime brokers may seem onerous, as we argue below this is not necessarily the case, and besides market discipline may perhaps be made more incentive compatible by requiring prime brokers as well as other market participants to purchase and hold a certain amount of traded subordinated debt in the hedge funds. Clearly, this is only realistic for hedge funds of a certain size, which one might call the *systemically important* hedge funds. The details of how this might best be achieved mirror the argument in Calomiris (1998). For instance, the holdings must be spread out so that there is little risk of the subordinated debt holder being bailed out, which would negate the purpose of subordinated debt to some extent.

## 4.2 Prescriptive Activity Restrictions

An important component in the regulation of financial institutions are activity restrictions. For example, banks are usually prevented from lending too much to a single entity in order to ensure the bank's solvency in case its largest client defaults.<sup>27</sup> However, from a macro-prudential point of view capital requirements constitute the biggest part of activity restrictions. Regulated financial institutions are required to hold 8% of their risk weighted assets as safe or riskless capital, implying an allowable leverage factor of 12. For the trading book, the bank's capital is at least three times 99% ten day VaR. For example, if the trading book holds US\$100mn of the S&P index, the required capital is around US\$27mn.

It is conceivable that similar restrictions could be imposed on hedge funds, perhaps limiting leverage, the type of trading positions or trading strategies. Unfortunately, this leads to a Catch 22 situation. On the one hand, for the regulations to be effective, hedge funds will have to lose the flexibility which defines them. On the other hand, the regulations may not be effective, possibly due to regulatory arbitrage or feedback effects. Indeed, dangerously high leverage is probably due to a vanishing capital base in a crisis situation, rather than a deliberate strategic decision. In that case regulation is counterproductive, since forcing the hedge fund to lower the leverage ratio would mean that the hedge fund needs to sell risky assets in a fire sale at the worst moment. This might not only use up market liquidity, but is likely to lead to further falls in asset prices, leading to yet more turbulence, which in turn would require hedge funds to sell even more assets and so forth. This is

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<sup>27</sup>In the Basel Accords, banks are not allowed to have any single large non-bank risk in excess of 25% of their capital, and the sum of large risks cannot exceed 800% of their capital. A "large risk" is defined as a loan that exceeds 10% of the capital of the bank that grants it. See for instance Basel Committee on Banking Supervision (1991).

precisely the scenario analyzed in Daniélsson and Zigrand (2003). In short, we do not believe that prescriptive risk-sensitive regulation is the panacea as sometimes claimed. In fact there are good reasons why it may lead to more, not less, systemic risk.

Indeed, such restrictions may not be necessary from a systemic point of view in the first place. The work of Gupta and Liang (2004) showed empirically that the fraction of live hedge funds that would violate the strict Basel-II capital requirements for banks is negligible. Furthermore, even if large hedge funds did want to employ extreme levels of leverage, their prime brokers and their major share holders, including the partners themselves, may not tolerate such high leverage. For small and medium-sized hedge funds, their leverage levels are unlikely to be important from a systemic point of view.

## 5 Proposals: Focusing on Systemic Events

Banking supervisors are faced with a dilemma. Even a remote probability that a hedge fund collapse would cause a systemic crisis warrants having some type of regulatory mechanism in place. At the same time, the extant regulatory tools of greater disclosure and activity restrictions appear too blunt to be able to provide an effective and efficient regulatory structure for hedge funds.

In designing prudential regulations, it is important to consider the actual externality meriting regulation, in particular, the notion of systemic crisis. Whilst there are various, often vague, interpretations of this concept, it is essential to define this concretely. Considering the regulatory and academic literature on the subject, what most people have in mind is a failure of markets to clear in an orderly manner, bringing with it a collapse of the financial system due to insolvencies leading to a potential domino effect in defaults.<sup>28</sup> The costs of such an event are likely to be enormous. If markets do not operate properly, the trades that are required to self-finance positions and to keep firms and financial institutions solvent cannot be executed at a reasonable, or indeed at any, price. If this situation lasts, the crisis will directly impact the production and consumption sectors of the economy leading to substan-

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<sup>28</sup>Many transmission mechanisms may lead to economic costs. Among them we can mention the failure to mark-to-market, the failure to respond to margin calls, the failure to sell assets held as means of payment against a debt as markets are inoperative (for instance frozen bank deposits). All these channels lead to defaults and result in further credit rationing.



tial real costs.<sup>29</sup> Whilst the costs of such an event are hard to quantify, the output losses during recent banking crises of 5-10% of annual GDP provide an indication of the potential scale (Hoggarth et al., 2003). Any regulatory proposals should therefore aim to minimise such costs and ensure an efficient and timely resolution to any such crisis.

It must however be stressed that a systemic crisis arising from a hedge fund failure appears to be a low probability, if high impact, event. In actual fact, almost all hedge fund failures and dissolutions get resolved without affecting markets significantly (there were about eight hundred hedge fund failures in 2003, up from seven hundred in 2002). This includes some sizeable funds, such as Robertson's Tiger Management funds for instance, which liquidated \$6 bn worth of assets in March 2000, having lost about \$20 bn prior to dissolution.

The economically reasonable approach to follow is two-pronged. Akin to the problem of setting up an efficient global financial system, the regulatory framework of hedge funds needs to comprise credible and clear ex-ante cost-sharing mechanisms as well as crisis management procedures.

Could the resolution process instigated by the New York Fed following the collapse of LTCM in 1998 provide important lessons for how to proceed ex-post? When the New York Fed learned of the pending collapse of LTCM and the potential systemic implications, they brought together all the key client banks and encouraged them to implement an orderly winding down process for LTCM's positions with the aim of providing the least amount of disruption to the economy. An important part of this process was that no public funds were used, with the Fed's role limited to managing the process. While the outcome is controversial, and there is no way to prove that in the absence of this resolution process there would have been a systemic crisis, the possibility that this could have happened appears to have justified the intervention.

While the Fed was able to use moral persuasion to resolve the LTCM crisis, what if the LTCM client banks had resisted more strongly, the Fed had been less determined or less persuasive, or the whole process had become politicized and bogged down? Such a possibility highlights the need for a credible resolution mechanism to deal with the default of systemically important hedge funds.

Whilst the objective of this proposal is clear – to minimize the potential real costs of such a failure – the procedural issues and related incentive effects

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<sup>29</sup>Our attempt to a formal modelling of this idea can be found for instance in Danielsson and Zigrand (2003).

are complex.<sup>30</sup> For example, if a formal mechanism is adopted, which party or parties have the ability or duty to trigger the resolution process – the regulator, the prime brokers (which at present are locally regulated entities for the most part), the creditor banks (including the subordinated debt holders) or the hedge fund itself? What are the informational requirements for this party? Under what jurisdiction does the resolution mechanism proceed? These are issues which require further consideration in order to provide the correct incentives for the various parties.

As a first pass, it would seem ideal that the relevant supervisors should have the duty and power to start and carry through the resolution process. It is also important that the supervisor starts this process as early as possible, both because the extent of the problem and the related costs grows significantly with time and because it does take some time to understand the exact nature of the hedge funds' positions. A carefully thought through contingency plan would contribute to minimal disruption. Both a hedge fund in difficulty and its prime broker(s) should also be obliged to alert the supervisor if they suspect problems, an obligation whose incentive problems may be alleviated in part by subordinated debt. The other client banks, to the extent they also have this knowledge, should have the same reporting obligation. Such obligations may not be onerous, since they may be to various degrees incentive compatible. For instance, prime brokers not only have typically extended some form of credit to the hedge fund which they may want to recover, they also risk foregoing the present discounted value of future transaction costs generated by the (live) hedge fund. And if history is anything to go by, unwinding, reorganizing or refinancing the portfolio of a hedge fund may in fact be a profitable endeavour, certainly if the trigger for the resolution mechanism was a temporary lack of liquidity by the hedge fund rather than a one-way bet gone bad.

In terms of the discussions themselves, both the client banks and the prime broker, whose role is particularly important, should have obligations to participate. Clearly the Chinese wall between the prime broker and the other divisions of the investment bank must be tight, for otherwise the investment bank might have an incentive to hasten the demise of a hedge fund. Enforcement of the necessary actions should be a part of the process and may require a special arbitration body. Additionally, it is important that principals in the hedge fund bear the majority of the cost of this process, and under no circumstances should public funds be contributed. Prime brokers may also need to make funds available during such a resolution procedure (which may

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<sup>30</sup>In another field, this was exemplified most recently by the, now shelved, 2001/2002 IMF proposals for a Sovereign Debt Restructuring Mechanism.

provide incentives for a closer prudential monitoring), with on the other hand their upside being the additional future revenues generated from a return to a well-functioning financial system. The costs to prime brokers must be reasonable and fairly shared in order to prevent prime brokers from moving out of the regulatory umbrella, by relocating offshore for instance. Obviously, the use of public funds, or even a bail out, gives rise to a moral hazard problem, further exasperating the systemic concerns.

Even this simple suggestive framework raises many procedural and incentive issues which would need to be addressed more formally. For example, might the exposure of prime brokers to the hedge funds lead them in some circumstances to allow the fund to ‘gamble for resurrection’ through taking on even more risk, and how can those circumstances be mitigated without calling for overbearing regulation? And even if the prime brokers did hold subordinated debt, doesn’t the fact that prime brokers are part of a major bank may again lead to the belief that if worse comes to worst, public funds will bail out the bank? Are the informational restrictions for investment banks likely to hold in practice? This preliminary discussion clearly highlights that further analysis is required. However, hopefully it will also play a broader role – focusing the regulatory debate towards designing reform proposals which address the key cost of a systemic hedge fund crisis whilst at the same time preserving the potential benefits which hedge funds can provide for a well-functioning financial system.

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