

THE IMPACT OF HEDGE FUNDS ON FINANCIAL MARKETS¹

1. Recent discussions on the impact of hedge funds on financial markets have mainly focussed on the prudential risks they pose to lenders and counterparties, or, in extremis, the risks they pose to financial system stability. (The paper, *Hedge Funds, Financial Stability and Market Integrity*, issued by the Reserve Bank in March 1999, presents an overview of these issues.) In contrast, the effects of hedge funds on particular market prices and on the integrity of those markets has received little attention to date.
2. The possibility that market participants can engage in profitable, yet destabilising behaviour, is now well recognised in the academic literature. This literature demonstrates that markets can display herd behaviour, in which participants follow "leaders", and this can result in overshooting of prices in these markets. This undermines the traditional view that speculation must be stabilising. That view was based on the assumption that profitable speculation must involve buying when the price is low and selling when the price is high. But, in markets characterised by herd behaviour, selling when the price is already low can be profitable if it induces others to follow and thereby cause the price to fall further. The problem may be particularly acute where there are players large enough to exert a noticeable influence on the market.
3. Hedge funds have found themselves in a strong position to exploit such trading strategies following their success in the UK devaluation of 1992. The publicity generated by that event gave them enormous standing in financial markets and many traders adopted strategies which mimicked those of the hedge funds. In the foreign exchange market, in particular, banks and investment banks systematically keep their better clients informed of the hedge funds' daily trading strategies. Combined with the willingness of some hedge funds to use leverage to build very large positions, this status places hedge funds in the position of market leaders, with the ability to influence the behaviour of others in markets.
4. The issues concerning the impact of hedge funds are of crucial importance to medium-sized economies, where markets are generally liquid but participants can build positions which are large relative to the size of markets. It would be wrong, however, to assume that the impact of hedge funds was limited to these markets. Hedge funds were major players in the ERM crisis in the early 1990s and in the US dollar/yen exchange rate last year.
5. The academic literature also recognises the potential for there to be circumstances in which a speculative attack on a currency may be self-fulfilling. The mechanism for this is that markets may anticipate that it would be simply too costly for the authorities to resist heavy selling pressures on their currency, even if the initial level of the currency would have been sustainable in the absence of the attack. Thus, a speculative attack could move

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a currency to a new, lower level and, once there, the economic forces set in train prevent the exchange rate from returning to its previous level even after the speculators have left the market.² Again, it seems likely that the risk of such an event would be increased by the presence of position-takers who are large enough to move the market and who might expect to profit by precipitating a speculative attack.

6. In a free and competitive market, the presence of any participants meeting these criteria would bring into question the integrity of the market – ie the degree of certainty that the market price is a true reflection of fundamental determinants. This in turn raises questions about whether the level of transparency in markets, and the mechanisms for ensuring “fair trading” practices, are adequate.
7. In this respect, the activities of the “global macro” hedge funds are of most interest³. While there is only a small number of such funds, their investment approach of aggressive position-taking has the potential to exacerbate stresses in world markets. It should be of concern to policy makers that, as well as positioning themselves to take advantage of expected market developments (which is a perfectly legitimate activity), these funds at times also try to influence the course of those developments. Their ability to do this reflects not only the size of their position-taking relative to some of the markets in which they operate, but their influence on the behaviour of other market participants because of the reputation they enjoy. Most countries, in their domestic markets (particularly those conducted on exchanges), have rules to prevent such outcomes. But, in markets such as foreign exchange and over-the-counter (OTC) derivatives, where trading is decentralised and global in nature, individual countries can find it difficult to impose or police rules to ensure fair trading.

Hedge Funds and Market Integrity: the Assessment

8. Opinion is divided on whether hedge funds played a significant role in the development of the Asian financial crisis of 1997. Although the statistics clearly point to the reversal of commercial bank lending to those countries as being a major external factor, most in the region believe that hedge funds played a significant role in enlarging the crisis and that this has been insufficiently recognised in the (admittedly limited) literature on the subject. Views in the major countries appear to have been influenced by an IMF report, *Hedge Funds and Financial Market Dynamics* (IMF 1998). Both the President’s Working Group on Financial Markets and a recent Bundesbank article (*Deutsche Bundesbank Monthly Report*, March 1999) cited the above report in reaching a sceptical view of the role of hedge funds in the Asian crisis. The evidence contained in that IMF report, however, is not very strong. The report downplayed the role of hedge funds in the Thai crisis on the grounds that they “...were at the rear, not the front, of the herd ...”. Data on the timing of hedge funds sales of Thai baht do not exist but, even if the IMF claim is correct, it is difficult to dismiss the role of hedge funds given that they had a short position in Thai baht equal to almost 5 per cent of Thailand’s GDP. Put another way, it seems hard to dismiss the role of hedge funds when their short positions would have put almost as much pressure on the currency as the Thai current account deficit (which has been widely seen as an

² This is known as the existence of “multiple equilibria”.

³ Attachment 1 describes the different types of hedge funds and sets out some of the facts that are known about them.

important factor in the currency crisis). In fact, some might regard the actions of hedge funds as described by the IMF as the ultimate in destabilising behaviour: they came into a market that was already under intense pressure and sold a large volume, pushing the currency over the brink. (See also the description of their activity in the Australian dollar below.)

9. The Report of the President's Working Group on Financial Markets also based its conclusions partly on an NBER paper (Brown, Goetzmann and Park (1998), *Hedge Funds and the Asian Currency Crisis of 1997*). This paper found that hedge funds' estimated short positions in Asian currencies did not seem to be correlated with movements in exchange rates. However, as data on these positions were not available, the authors constructed their own estimates using a methodology initially developed to analyse returns of mutual funds managers. This methodology, however, cannot readily be transferred to analysis of hedge funds as they follow a more diverse and variable trading strategy. In particular, the constructed data imply implausibly large estimates of short positions (see Attachment 2). These flaws in the data are on such a scale that they call into question the findings of the paper.
10. Overall, the Bank's view is that the role of hedge funds in the events of 1997 and 1998 in the Asia/Pacific region have been dismissed too readily.

The Experience of Australia

11. The experience of Australia in 1998 with respect to the exchange rate of the Australian dollar illustrates the destabilising impact which hedge funds can have. Hedge fund activity in the Australian dollar came in three stages:
 - They first emerged as large-scale players in the March and June quarters of 1998 when the exchange rate was around US65 cents – ie after it had already fallen by 15 per cent. During this period they quietly established large short positions in the Australian dollar. Reports from dealers suggested that the positions were in the order of \$A10-15 billion, equal to about 2½ per cent of Australia's GDP and therefore very significant. Essentially, this first stage involved spotting a trend that had been underway in the exchange rate and establishing a position which could capitalise on the trend-following behaviour of the market.
 - The second stage involved a more aggressive stance as the exchange rate approached its post-float lows around US60 cents, a time when the market was naturally quite sensitive. The key features of hedge funds' activities were the signalling to other market players that they were about to attack the \$A (a move which heightened uncertainty and deterred potential buyers from remaining in the market); lowering offer prices in the brokers even though they were able to sell all they had on offer at the existing price; and concentrating sales into periods of thin trading. One consequence was that exporters, who had been keen buyers of \$A at higher levels, not only stopped buying but began to sell in the expectation that the exchange rate would fall further – a classic example of herd-like behaviour.
 - The third stage involved the hedge funds taking advantage of other participants' desire to sell by quietly buying back, unwinding their short position, and thereby taking profits. Short positions established in the first half of 1998 were strongly in profit for a substantial period and thus there was ample opportunity for this to be completed. Despite that, it seems that only limited profit taking occurred, as hedge

funds held on in the expectation of further falls. In fact, the Australian dollar did fall as far as US55.3 cents in August, but events then moved very quickly. In late September and early October, the near collapse of Long Term Capital Management, a major hedge fund, caused banks to cut back on their funding to all hedge funds. Deprived of the credit used to fund their short positions, hedge funds were forced to cover those positions by buying in the market. This produced a sharp rise in the exchange rate, back to around US65 cents, roughly where it had been before the hedge funds' selling started six months earlier.⁴

12. Australia has fully open markets, and market participants are free to buy or sell as they see fit. Nonetheless, the size of the positions taken by hedge funds, in Australia (and even more so in Hong Kong and Thailand) and their apparent intention to then force a change in the price, raises concerns about the possibility of market disruption. Notably, they were not merely transacting to take advantage of expected events but were doing so in a way which seemed intended to try to influence the course of events, posing a risk to market integrity.
13. As said earlier, there is a tendency for the authorities in major countries to downplay the impact of hedge funds on financial prices. In the case of their own markets, perhaps this reflects a view that the markets are deep and liquid, and no participant or small group of participants can have a significant effect. While there is a lot of truth in this view, it should have been seriously challenged by extraordinary movements in the US dollar/yen exchange rate last year. This was one of the largest changes in a major country's exchange rate since the start of floating nearly 30 years ago – a move of about 25 per cent in a little over a month, of which 15 per cent occurred in 30 hours. The timing of the move and the feedback from the market makers both pointed directly to the central role of hedge funds, who were forced to liquidate formerly profitable positions to meet margin calls or because funding from banks was being cut back. It is surprising, therefore, that there has been so little public analysis not only of the move itself but of the role played by hedge funds.

Are Hedge Funds Different from Commercial Banks and Investment Banks?

14. Some claim that hedge funds are being made scapegoats for recent instability, and that in fact their activities are no different to those of other market participants such as commercial banks or investment banks. It is said, for example, that hedge funds are, on average, less highly geared than commercial banks and investment banks.
15. These conclusions about the gearing of hedge funds are based on figures reported by industry bodies such as MAR Hedge. They show that those hedge funds that do report gearing generally show figures of less than 3:1. In contrast, a typical commercial bank would run gearing of about 10:1, while investment banks have gearing closer to 20:1.
16. These comparisons are of very limited value because:
 - the bulk of hedge funds, particularly the global macro funds which are generally identified with the recent financial crises, do not report their gearing; and

⁴ Discussions with the Hong Kong Monetary Authority and the South African Reserve Bank indicate that hedge funds used similar approaches in the attacks on the Hong Kong dollar, during August and September 1998, and on the rand, which lasted from May to August 1998.

- the figures that are reported are based only on balance sheet totals. Since it is widely acknowledged that hedge funds rely principally on off-balance sheet techniques (futures, forward contracts etc) to obtain leverage, the reported figures are largely meaningless. (Note that the reported figures are not audited in any way.)
17. The fact is that no reliable or comprehensive data on the gearing of hedge funds are available. Data on the one fund for which information is available – LTCM – show a very high level of gearing. Even before the crisis – ie before it began losing capital – its balance sheet gearing was 25:1 and, in addition, it had gross futures, forward and options contracts outstanding equal to about 300 times its capital.
 18. In any event, comparisons between hedge funds and commercial and investment banks based purely on gearing ratios are misleading, as they do not take into account the very different business approaches of the various types of institutions. The great bulk of commercial and investment bank balance sheets are devoted to supporting client businesses rather than position taking. To the extent that they do engage in position taking, it tends to be at a disaggregated level, by individual dealers. In contrast, hedge funds' positions are concentrated and centrally controlled. One consequence of this is that individual positions of banks tend to be smaller and less strongly held, and therefore less likely to have effects on markets. Also, banks are mindful of their wide-ranging relationships with governments and businesses in individual countries, and therefore less inclined to pursue trading strategies which could disrupt a country's markets and harm the bank's reputation. Hedge funds, in contrast, have no on-going relationships with most of the countries in which they trade and hence can be purely opportunistic.
 19. It follows from the above that it is not valid to conclude that, because hedge funds' assets are much smaller than those of banks (or even mutual funds, pension funds and life offices), their impact on markets is less. For one thing, the extensive use by hedge funds of off-balance sheet instruments gives them more influence than their asset size would suggest. Perhaps more importantly, it is *changes* in positions that influence market prices, and in this respect hedge funds are much more active than banks (whose main business is not position taking) or mutual funds, pension funds or life offices (whose positions in markets are constrained by the benchmarks they follow).

Measures to Reduce the Risk of Instability

20. Measures which could reduce the risk of market instability fall into two groups: those that could be implemented by individual countries; and those that require international co-operation.
21. On the former, there is the obvious point that the likelihood of becoming subject to a speculative attack is reduced if a country's macro policies and economy are in good shape. But good fundamentals do not preclude the possibility of an attack; international events can dominate, as Australia's experience last year showed. The solid structure of the Australian economy did, nonetheless, make it better able to withstand the impact of the speculative pressure.
22. Structural factors affecting markets can also be important, although the claims by some commentators that small countries can minimise the chances of a speculative attack by developing deep and liquid markets seem overstated. While there are many good reasons for a country to develop deep and liquid markets, the evidence does not support the conclusion that they reduce the risk of speculative attack. In fact, the opposite seems to be the case. Before the crisis, Thailand and Hong Kong had by far the most liquid foreign

exchange markets in Asia (except Japan); relative to GDP, turnover was well up with developed country standards. Similarly, the Hong Kong stock market was the most liquid market in non-Japan Asia, and the Australian dollar is the seventh most actively traded currency in the world. Yet it was these markets, rather than other less liquid markets in the region, that were attacked. Unfortunately, liquid markets are one of the characteristics favoured by speculators, because they give scope to establish and later reverse sizeable positions. In this respect, the activities of hedge funds are more of an issue for medium-sized economies with active markets than small economies with illiquid markets. The real issue facing small countries is not the liquidity of their markets but the potential to be overwhelmed by the funds flows originating from the large economies. When a very small number of market participants can quickly establish a position in a currency that is a large percentage of the country's GDP, as was the case in Thailand and Hong Kong, the potential for market disruption is very high.

23. Because of the global structure of most markets, measures aimed at preventing market integrity are likely to require international co-operation, particularly the co-operation of the large countries whose firms dominate world financial markets. This was recognised in the Report of the Prime Minister's Task Force on International Financial Reform, which contained some proposals for curtailing the possible deleterious effects of hedge funds on financial markets
24. Most of the international effort in this area is being carried out in three working groups set up by the Bank for International Settlements. Details of these are given below. The international association of securities regulators, IOSCO, has also been examining various issues, particularly the counterparty risk management practices of firms operating in financial markets. In the US, the President's Working Group on Financial Markets has also produced a report looking at the implications of the LTCM episode. Recognising the range of work being undertaken in this area by the various bodies, the Financial Stability Forum, a G7 group comprising bank, securities and insurance regulators, has recently set up a Group to take stock of, and co-ordinate, the various strands of the work underway.

Summary of Work Underway on Highly Leveraged Institutions

Basle Committee on Banking Supervision Working Group (the Brockmeijer Group)

25. The report noted that most institutions with exposures to hedge funds appeared to have tightened their approaches to assessment, measurement and management of these exposures following the events of 1998. In order to ensure that these improvements are locked in over time, the report made recommendations for sound practices in the following areas:
 - establishing clear policies and procedures for interactions with HLIs as part of the overall credit risk management environment;
 - employing sound information gathering, due diligence and credit analysis practices which address the specific risks associated with HLIs;
 - encouraging the development of more accurate measures of exposures resulting from trading and derivatives transactions;
 - setting meaningful overall credit limits for HLIs;

- linking credit enhancement tools, including collateral and early termination provisions, to the specific characteristics of HLIs; and
 - closely monitoring credit exposures vis-à-vis HLIs, taking into account their trading activities, risk concentration, leverage and risk management processes.
26. The report noted that many of the systemic risks associated with the activities of HLIs could be addressed through better risk management, along the lines of these recommendations, at the counterparty level. Prudent internal risk management can have the effect of reducing the leverage of HLIs, and limiting the riskiness of HLI portfolios, thereby also reducing the potential for systemic disruptions resulting from a rapid deleveraging or liquidation of positions.
27. This report was circulated to national banking supervisors in February. A stock-taking of progress that has been made in implementing these recommendations will be undertaken soon. As to the situation in Australia, APRA advises that, as a first step, it has written to Australian banks to bring the recommendations to their attention.

BIS Committee on the Global Financial System Working Group on Transparency Regarding Individual Positions (the Fisher Group)

28. This group completed its report in late March. The report was considered at the early April meeting of the Committee on the Global Financial System (CGFS) which endorsed the report's recommendations. The recommendations were as follows:
- that all financial institutions be encouraged to make available to clients and lenders a greater range of information on their risk profile. This would include data on the size of risks taken by institutions and their distribution (or concentration) across risk types (credit, market) and market groups (type of product, geographical region). A template for reporting these data was suggested. While the recommendations are intended to encompass all financial institutions, their main impact would be on non-banks since banks already disclose a lot of data;
 - that a broader group, covering a wide range of (bank and non-bank) supervisors be set up to refine the template and work towards implementation. This new broader group is currently being formed. It will comprise representatives of bank, insurance and securities regulators;
29. It is not clear yet precisely how much reporting will be put in place. At this stage, however, it appears that the general thrust of the Fisher Group recommendations have been picked up in the recent US Report of the President's Working Group on Financial Markets. Given the importance of the US in these matters, the likelihood of some concrete measures emerging from this work looks quite high.

BIS Committee on the Global Financial System Working Group on Transparency Regarding Aggregate Positions (the Patat Group)

30. The mandate given to this Group was to look at what aggregate data on financial markets could be collected to enhance the efficient operation of markets.
31. Despite a wide divergence in initial views between the members on the type of data that could be usefully collected, the Group agreed on the following recommendations:

- collections should initially be focussed on the foreign exchange market since this is the market of most interest to the authorities and the market in which data are easiest to collect;
 - collections should include more frequent data on market turnover and on the positions of major financial participants. Data would be published in aggregated form, with details limited to the category of institution rather than individual firms;
 - data on credit exposures should be enhanced (by extending the current BIS banking statistics to include off-balance sheet funding by banks, more detail on the currency and maturity profiles of loans and, possibly, lending by non-banks).
32. These recommendations were endorsed at the June meeting of the CGFS, and discussions are now to take place with private sector participants and non-bank regulators to assess the feasibility of implementing the desired collections.
33. The Bank strongly supports the report's recommendations.

Financial Stability Forum

34. The Financial Stability Forum has established a working group to take stock of, and coordinate, work already underway, and assess any supervisory or regulatory actions which might minimise instability. Australia is a participant in this working group. The full terms of reference and membership of the working group are in Attachment 3.
35. In recognition of the inadequate assessments available to date of the role of hedge funds in the recent financial crises, the working group has commissioned a new study, to be led by the IMF, of the activities of hedge funds in the Asian Pacific region in the 1997/1998 period.

Overall Assessment

36. If implemented, measures proposed by the various Groups would make a helpful contribution to reducing the potential for market disturbances arising from the activities of highly leveraged institutions, both by putting the relationship between hedge funds and lenders on a more prudent footing and increasing the degree of transparency in markets. There is no predisposition at this stage to go to the next step, which would involve closer regulation of OTC markets, but as the President's Working Group notes, if measures currently being proposed are not effective, these other options may need to be considered.

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SOME BASIC FACTS ABOUT HEDGE FUNDS

There is no standard definition of a hedge fund. Their typical characteristics are: they are limited partnerships whose main function is investment management; they are generally run out of the US, though legally are domiciled in offshore tax havens; they do not solicit funds directly from the public or advertise, but attract investors by word of mouth; and they have high minimum investment levels, ranging between US\$100,000 to US\$5 million, with US\$1 million common. These latter characteristics allow them to gain exemptions from various US federal securities laws, such as Securities and Exchange Commission (SEC) reporting, regulatory restrictions on leverage and trading strategies, and investor protector legislation.

Hedge funds may be grouped into four broad categories, defined by investment strategy:

1. *market-neutral* or *relative-value* funds which invest in fixed income and/or equity instruments and adopt strategies which do not depend on the general direction of markets. Managers exploit market inefficiencies, looking for disparities in pricing relationships between instruments with similar pricing characteristics (including fixed interest arbitrage, convertible bond arbitrage and mortgage-backed securities arbitrage, and derivatives arbitrage, and where the price anomalies are generally driven by government intervention, policy changes or forced selling).¹ These funds had traditionally been regarded as the most conservative of hedge funds because they limit their operations to arbitrage, which was seen as a low-risk activity. However, the episode involving Long-Term Capital Management, which was counted in this group of funds, showed that such activities can be very risky if they are funded by a high level of leverage. According to the IMF (1998), market-neutral funds comprise about 25 per cent of funds and 20 per cent of assets.
2. *event-driven* funds which are also active in fixed interest and equity markets but base their strategies on the actual or anticipated occurrence of a particular event, such as a merger, bankruptcy announcement or corporate re-organisation. According to the IMF (1998), event-driven funds comprise about 15 per cent of funds and 10 per cent of assets.
3. *long/short* funds which invest in fixed interest and, especially, equity markets, combining short sales with long investments to reduce, but not eliminate, market exposure. This may entail, for example, borrowing securities the hedge fund judges to be overvalued from brokers, and then selling them on the market in the expectation that the price will be lower when the fund has to buy the securities back to be able to return them to the brokers. These funds can take positions along the whole risk-return spectrum and try to distinguish their performance from that of the asset class as a whole. According to the IMF (1998), these funds account for only a very small part of the market, but they are given much more prominence in the report by Goldman Sachs and Financial Risk Management Ltd.
4. *tactical-trading* funds, including most *macro* and *global* funds, which speculate on the direction of market prices of currencies, commodities, and equities and bonds on spot or futures markets. Global funds invest in emerging markets or specific regions, of which

¹ This is not the traditional definition of arbitrage, which is based on risk-free transactions. In contrast, the transactions undertaken by hedge funds are in fact speculative and are described by the Economist (17 October 1998) as “expectations arbitrage” since they are based on an expectation that deviations from historical relationships between financial prices will be corrected. The OECD reports that the first hedge fund was set up by Alfred Winslow Jones in 1949 to balance short and long positions held by him in the equity market to reduce overall risk.

Tiger Fund is probably the most famous. The most famous macro fund group is probably George Soros's Quantum Group. Management of tactical funds is described as either systematic or discretionary. Systematic managers follow trends identified by technical analysis using proprietary computer models, while discretionary managers use a less quantitative approach, relying on both fundamental and technical analysis. Tactical-trading funds are the most volatile of the different types of funds. According to the IMF (1998), these funds account for 54 per cent of funds and 67 per cent of assets.

There is no authoritative source of information about hedge funds. Any information is provided voluntarily by the funds themselves and without due diligence, so data are sketchy and should be used with caution. Hedge funds are not allowed to advertise and so they depend on "word of mouth" to generate investor funds. One way that they do this is to provide information to various industry groups, like Van Hedge Fund Advisors, Hedge Fund Research, and MarHedge. For a fee (in thousands of US dollars), these groups provide investors with statistics on earnings and some basic figures on balance-sheet size and leverage. These figures are not subject to scrutiny and no assurance is given that definitions are applied consistently and that data are comparable. For example, groups like MarHedge do not specify a definition of leverage, but rather leave it to the discretion of the fund to report leverage statistics on whatever basis it chooses.

There is even considerable uncertainty about the number of hedge funds and the size of their assets. Goldman Sachs and Financial Risk Management Ltd (July 1998) estimate, for example, that there are 1,300 hedge fund management groups which operate over 3,500 hedge funds (with different risk and investment characteristics). Total capital is estimated to be about US\$200 billion and total assets at about US\$400 billion. Van Hedge Fund (July 1998), a data collection group, says there are 4,000 funds, while The Economist (17 October 1998) estimates that there are about 3,000 funds. These numbers are considerably larger than those set out in IMF (1998), which reports that there were about 1,000 fund managers with about US\$110 billion in assets in 1997. Even reasonable estimates of the number of hedge funds can vary by a factor of up to four!

On an aggregate level, the actual funds invested with hedge funds may appear fairly small relative to total funds in the financial sector. For instance, the Bundesbank in its March 1999 report estimates that capital invested with hedge funds in 1995 was around US\$300 billion, or 1.3 per cent of the US\$23,400 billion in total funds invested with traditional institutional investors in the OECD countries. Such a comparison, however, does not necessarily offer a good insight into the potential market impact of hedge funds, due to the effect of leverage and 'herd behaviour'.

In spite of their relatively small size, hedge funds are significant market players. Their trading strategy of eschewing benchmarks and seeking maximum absolute returns in a range of asset classes means that their investment positions can change rapidly and by large amounts, thereby having an impact on market prices. Investors find them attractive because of their generally low correlation with overall market performance. As the OECD's recent report states "hedge funds have become an integral component of the new financial landscape and are considered by most observers to be a permanent feature" (OECD 1999 p.7). In relation to this point, the Bundesbank noted that because many hedge funds depend upon the exploitation, and thus the elimination, of market imperfections, it is likely that at some point diminishing returns may set in. This might then result in hedge funds taking on riskier, more highly leveraged positions than previously, in an attempt to maintain their high rates of return.

The OECD reports that, while the bulk of investment in funds come from market-savvy wealthy individual investors (about 80 per cent), investment by institutional investors, particularly university foundations and endowments, has expanded in recent years, accounting for about 30 per cent of new funds. Some of these investments have been very large; for example, according to the OECD, Cornell University now invests over 10 per cent of its total \$2.3 billion endowment in hedge funds, while the Yale University endowment invests roughly one-quarter of its total assets in these funds.

The events of late 1998 have not led to the demise or fundamental weakening of the hedge fund industry. Table 1 contains details of asset flows into and out of the approximate 1,200-odd hedge funds which choose to report to Mar/Hedge. These funds represented around US\$110 billion of funds under management as at the end of December 1998. The categories have been expanded from those mentioned above.

While investors in hedge funds did withdraw assets in 1998, the size of the withdrawals were small (about 5 per cent). Not surprisingly, global funds, and the large global macro funds in particular, saw the largest redemptions, as these are perceived to be the riskiest category (that is, while they have had the highest returns, they also demonstrate the greatest volatility of returns). The Soros funds, for instance, experienced an outflow of US\$566 million in December. This was soon reversed, however, with the next two months seeing inflows of US\$783 million and US\$231 million.

Table 1: Flows into and out of hedge funds²

	October	November	December	January	February	March
	US\$ m	US\$ m	US\$ m	US\$ m	US\$ m	US\$ m
Event driven	-227	-11	-77	-1,461	36	-20
Global emerging	-	-63	-44	-41	-3	-20
Global established	392	81	64	-2,254	124	244
Global international	-386	-203	-635	3,785	483	-7
Global macro	998	-3,625	-690	217	-163	-50
Market neutral	-81	-420	-407	-718	64	405
Short sellers	70	-31	-30	-12	34	24
Fund of funds	-437	-353	-322	-1,975	542	21
	330	-4,625	-2,141	-2,459	1,116	735

Source: Mar/Hedge Monthly reports.

February represented something of a turning point following the crisis, with a net inflow into hedge funds of over US\$1 billion. There are also reports that an increasing number of both pension/superannuation funds and educational endowments are now considering investing in hedge funds as part of their risk diversification strategy. Reports of increased interest in hedge

² According to Mar/Hedge's terminology, event driven funds focus on opportunities arising from one-off situations; global emerging funds focus on less mature financial markets; global established funds focus on established markets in the US, Europe and Japan; global international funds focus on non-US stocks; global macro funds invest opportunistically in all markets; market neutral funds attempt to neutralise market risk through the use of long and short positions; short sellers attempt to sell overvalued securities, then buy them back at a lower level; and funds of funds allocate capital among different funds.

funds have also noted the rapid pace of startups and the healthy state of the employment market in hedge funds, with many traders from mainstream financial institutions joining the trading desks of hedge funds.

Not only are hedge funds attractive to investors, but they are also attractive to commercial and investment banks as clients because they generate a lot of market turnover and therefore income for banks' dealing rooms. The OECD notes that: "because some hedge funds often transact in enormous size, there are specialist derivatives desks dedicated solely to hedge fund clients" and hedge funds are very big users of swaps and credit derivatives provided by banks (OECD, p 8-9). In addition, a growing number of banks are either running in-house funds or managing funds of funds. Formal and informal staff connections are also important, with staff moving between banks and hedge funds.

Hedge funds make use of a wide range of financial instruments. Many take long or short positions, or both, in equity or fixed income securities. They may also use exchange traded futures contracts or over-the-counter derivatives, while others are active in the foreign exchange or commodities markets. The President's Working Group notes that "in general, hedge funds are more active users of derivatives and of short positions than are mutual funds or many other classes of asset managers". Often there is better liquidity to be found in the derivatives markets than in the underlying instrument, and costs are usually lower. Additionally, derivatives offer a method of obtaining leverage, beyond that of simply borrowing money from other financial institutions.³

The use of leverage by hedge funds varies tremendously, although assessments are complicated by inadequate reporting requirements, the absence of a standard definition of leverage, and by the treatment of off-balance sheet activities. The OECD argues that "the use of leverage is a mainstay of some hedge fund strategies, with the degree of leverage a function of the manager's appetite for risk, the riskiness of the bets involved, and the "costs" of leveraging" (page 8). The IMF (1998, pages 7-8) estimates that 30 per cent of hedge funds do not use any leverage, and that only 16 per cent of hedge funds have a borrowing to capital ratio in excess of 1. In contrast, Goldman Sachs and Financial Risk Management Ltd suggest that average leverage is about 2. Information gained from Commodity Pool Operator⁴ (CPO) filings indicate that most reporting hedge funds have balance sheet leverage ratios (total assets to capital) of less than 2-to-1. The President's Working Group notes exceptions to this. According to September 1998 filings, at least ten hedge funds with capital exceeding US\$100 million had leveraged their capital more than ten times, with the most leveraged fund displaying leverage of more than 30 times. Due to the presence of economic or off-balance sheet leverage, none of these sets of statistics, or others that are available, necessarily provide a reliable guide to the exposure of hedge funds to changes in financial prices (although one might assume a fund with balance sheet leverage of 30 times is more likely to take aggressive positions).

³ The President's Working Group defines leverage in two ways; as balance-sheet leverage, which refers to the ratio of assets to net worth; and economic, or off-balance sheet, leverage, which is a measure of economic risk relative to capital. Economic leverage can be obtained through the use of repurchase agreements, short positions, and derivatives contracts.

⁴ Sponsors of hedge funds that trade on organised futures exchanges and have US investors are usually required to register with the Commodity Futures Trading Commission (CFTC) as Commodity Pool Operators, and are subject to periodic reporting, record keeping and disclosure requirements.

Table 2 sets out monthly median returns for the different categories of hedge funds and for the Standard and Poors 500 index. Over 1998, no category of fund managed to outperform the S&P500 index (while hedge funds typically do not benchmark, preferring to measure their performance in absolute terms, the S&P500 at least provides an indication of overall market performance). Not surprisingly, emerging market funds produced by far the worst returns over the year, on average losing around 31 per cent of their asset values, and no category managed to post returns above 5 per cent. In 1999, results have been mixed, with quite a few funds still experiencing negative returns. Two of the most well known funds, George Soros's Quantum Fund and Julian Robertson's Tiger Management, posted large negative returns (-13.8 per cent and -8.5 per cent respectively) over the first four months of 1999. Nonetheless, as noted earlier, this has not prevented a resumption of investor subscriptions.

Table 2: Hedge Fund Returns

	1998			1999			March		
	1998 Annual	Oct	Nov	Dec	Jan	Feb	Mar	5th %ile	95th %ile
Event driven	3.1	0.8	1.7	1.7	1.3	-0.2	0.5	9.9	-2.4
Global emerging	-31.1	0.9	4.9	-0.7	-1.2	0.1	4.3	23.4	-3.4
Global established	7.3	2.3	4.5	4.0	2.7	-2.6	1.4	13.1	-6.9
Global international	4.3	0.2	3.4	2.3	2.0	-0.1	1.8	9.1	-8.4
Global macro	3.7	-2.1	2.8	2.6	1.2	-0.7	-0.2	8.3	-9.4
Market neutral	5.1	0.0	1.3	1.2	1.2	0.7	0.2	6.0	-5.9
Short sellers	4.3	-9.6	-6.0	-4.0	-5.3	9.8	-0.4	4.0	-21.1
Fund of funds	0.4	-0.4	1.5	1.3	1.4	-0.2	0.8	6.2	-2.6
S&P500	26.7	8.0	5.9	5.6	4.1	-3.2	3.9		

Source: Mar/Hedge reports. See Table 1 for a definition of categories.

COMMENTS ON BROWN, S.J., W.N. GOETZMANN, AND J. PARK, "HEDGE FUNDS AND THE ASIAN CURRENCY CRISIS OF 1997" NBER WORKING PAPER 6427

Brown, Goetzmann and Park argue that, while the Asian currency positions of the macro hedge funds have fluctuated substantially at times, these positions do not appear to be related to changes in the exchange rates of Asian currencies. Hence, they downplay the significance of hedge funds in the Asian currency crisis.

The authors regress monthly changes in the exchange rate on the estimated long/short exposures of ten macro hedge funds. Data on hedge fund exposures are not available and so the authors use a method to infer exposures based on monthly returns data of hedge funds. Conceptually, this involves two steps: first, regressing each fund's returns on the returns from hypothetical passively-managed portfolios of asset classes; and, second, multiplying each fund's net asset value by the co-efficients from the previous regression to estimate the fund's total dollar exposure to each asset class.

The estimation, however, is subject to a number of criticisms. The main results are obtained by including only one currency – the Malaysian ringgit – in the hypothetical portfolio which is used to 'explain' hedge funds' performance. Technically, this procedure can only be valid if the excluded assets (ie, all other possible currencies and asset classes) are all uncorrelated with the ringgit, which is clearly not the case. If, for example, hedge funds sought to manage their risks by simultaneously taking positions in a range of correlated assets, the impact of ringgit movements on fund returns would reflect the interaction of all these positions, and could not validly be attributed just to the fund's ringgit exposure.

Another problem is that a lack of data precludes the estimation of position changes over short time periods. In fact, the method purports to estimate a series of average positions in ringgit held over periods of four months duration. This means that changes in hedge fund returns attributable to shorter-term changes in positions cannot be picked up.

Overall, the results produce estimated positions which are very large. The estimates for positions in Malaysian ringgit at times reach over US\$200 billion (for example, US\$225 billion in February 1996). They also fluctuate sharply from month to month, between being short and long the ringgit. The authors find that while the positions of hedge funds can be highly correlated with each other, they are not correlated with exchange rate movements in the ringgit.

The authors repeat the exercise for an unweighted basket of ten Asian currencies. The same restrictive assumptions are applied, this time implying that the only position of hedge funds is in Asian currencies. This again produces large positions – eg short positions reaching about \$US400 billion in January, February, September and October 1996 and a long position of US\$1,500 billion in December 1995. Again they found is no correlation between exposures and exchange rates.

The basic criticism of the paper is that the methodology assumes that movements in specific currencies over fixed time intervals were the sole source of returns for the hedge funds. Movements in share prices, interest rates and capital values of emerging market debt (eg Russia), as well as returns attributed to intra-period trading, are ignored. A zero return would yield a result of "no exposure", while it could in fact have represented a net outcome of several large exposures. It is not surprising, therefore, that the estimates of positions that are generated fail the "common sense" test. Consider the Malaysian results. A ringgit position of US\$200 billion amounts to 2½ times the country's GDP and close to a whole year's turnover in the foreign exchange market. It is inconceivable that such positions could be built up and liquidated in a month.

FINANCIAL STABILITY FORUM

3 May 1999

WORKING GROUP ON LEVERAGE/HLIs

Proposed terms of reference

The working group on HLIs should help ensure a timely and co-ordinated response to the various concerns raised by institutions employing a high degree of leverage in financial markets. To this end, it should:

1. Assess the challenges posed by HLIs to financial stability in both developed and developing countries.
2. Take stock of work that has been completed or is underway in the groupings represented in the Forum or elsewhere on these issues.
3. Establish what is being done to implement recommendations already made and consider the need for further impetus to enhance implementation.
4. Make recommendations, where necessary, to improve co-ordination between existing organisations working in this area.
5. Identify issues that have not been covered in existing work and propose suitable procedures for dealing with them.
6. Foster a consensus on substantive supervisory or regulatory actions which would minimise the destabilising potential of HLIs.
7. Provide a status report to the Forum's next meeting.

**FINANCIAL STABILITY FORUM
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**Membership of Working Group on
Highly Leveraged Institutions**

Howard Davies (chair)	Financial Services Authority, London
Ric Battellino	Reserve Bank of Australia, Sydney
Jan Brockmeijer	De Nederlandsche Bank, Amsterdam
David Brown	Ontario Securities Commission, Toronto (Chair, IOSCO Task Force on Hedge Funds and Other HLI's)
Norman Chan	Hong Kong Monetary Authority, Hong Kong SAR
Peter Fisher	Federal Reserve Bank of New York, New York (Chair, CGFS Working Group on Enhanced Public Disclosure by Individual Institutions)
Jean-Pierre Patat	Banque de France, Paris (Chair, CGFS Working Group on Aggregate Market Information)
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