



EUROPEAN CENTRAL BANK

LARGE EU BANKS' EXPOSURES TO HEDGE FUNDS

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LIST OF COUNTRY ABBREVIATIONS

AT	Austria
BE	Belgium
CY	Cyprus*
CZ	Czech Republic*
DE	Germany
DK	Denmark
EE	Estonia*
ES	Spain
FI	Finland
FR	France
GR	Greece
HU	Hungary*
IE	Ireland
IT	Italy
LT	Lithuania*
LU	Luxembourg
LV	Latvia*
MT	Malta*
NL	Netherlands
PL	Poland*
PT	Portugal
SE	Sweden
SI	Slovenia*
SK	Slovakia*
UK	United Kingdom
US	United States
EU15	European Union (15 countries, before enlargement on 1 May 2004)
EU (EU25)	European Union (25 countries, after enlargement on 1 May 2004 with 10 countries marked with *)

EXECUTIVE SUMMARY

Due to the rapid expansion of the role of hedge funds as participants in financial markets and counterparties to financial institutions, monitoring their activities and assessing the implications for financial stability has become increasingly relevant. This study, carried out by the Banking Supervision Committee (BSC) of the European System of Central Banks (ESCB), with the assistance of its Working Group on Macro-Prudential Analysis, investigates the links between large EU banks and hedge funds, given the important role that the former play in hedge fund operations. The report is part of the BSC's continued efforts to gain a better understanding of the implications of the rapid expansion of hedge fund activities for the European financial system.

The study is to a large extent based on the findings of a survey that was conducted through the national central banks and supervisory authorities represented in the BSC and which consisted of both a quantitative and a qualitative part. The qualitative part addressed a number of risk management issues relevant for banks' interactions with hedge funds. The quantitative part was dedicated primarily to banks' direct exposures to hedge funds, comprising their financing, investment, trading and income exposures. As the replies to the survey were sometimes incomplete and only a limited number of large EU banks provided comparable quantitative data, the conclusions presented in this report should be considered as preliminary and only indicative of existing exposures and risk management practices.

The survey results revealed that the direct exposures of large EU banks to hedge funds varied significantly across countries. In many EU countries, investments of banks in hedge funds were the major, and sometimes the only, direct link between the two types of institutions. All types of direct exposures seem to be growing rapidly, although they were generally limited in relation to banks' balance sheets and total revenue or similar exposures undertaken by US peers. This is at least partially due to the fact that the global prime

brokerage market is largely dominated by US firms. However, it is very likely that the absolute and relative size of EU banks' exposures to hedge funds will increase further in line with the continuing expansion of the hedge fund industry.

Most of the banks extensively dealing with hedge funds had specific guidelines and advanced risk management systems for this business or were in the process of improving them further. As a rule, large EU banks had stringent requirements for exposures to hedge funds with a strong emphasis on collateralisation. Sometimes these requirements seemed very strict for banks with lower exposures or without a strong focus on the hedge fund business. Nearly all cash lending exposures were collateralised. However, there was also evidence that banks quite often traded with hedge funds in OTC (over the counter) instruments on variation margin only. In the due diligence process and in credit analysis, banks also seemed to rely rather heavily on a manager's track record and many banks did not mention on-site visits as part of this process. Many banks with higher financing and trading exposures used sophisticated "potential future credit exposure" measures to account for the expected downside risks arising from the interaction of market, credit and liquidity risks. Most of the banks also reported the use of stress tests for the evaluation of potential effects of volatile or illiquid markets on their exposures.

With regard to the transparency of hedge funds, some banks seemed to be content with the information provided to them, despite reporting lags and the diversity in existing practices. Regular information flows typically covered net asset value and performance figures (changes in net asset value per share), in many cases together with risk management reports including some "Value at Risk" numbers. Transparency questions were often part of the due diligence process and credit rating or scoring models, although the link between credit terms and transparency could probably be stronger.

The survey also highlighted a number of areas with scope for further improvement, notably:

- Counterparty discipline, as applied by banks, was found to be under pressure owing to highly competitive market conditions. Particularly the larger hedge funds were successful in negotiating less rigorous credit terms.
- Banks' stress tests, in particular the regular ones, included only historical scenarios and were often applied to individual hedge funds only. The stress testing of collateral could also be further improved.
- Aggregation by banks of their hedge fund exposures across the entire financial group and/or different business areas/geographical regions was seen as problematic.
- Hedge fund disclosures and information on leverage were, despite some progress, lagged and not always adequate. In many cases, hedge funds still provided banks with relatively crude measures of leverage.
- Banks' answers also raised questions about whether they always had enough timely information on the whole portfolio structure of hedge funds or whether they took this information sufficiently into account, particularly for the larger hedge funds that have financing and trading relationships with several counterparties.

Regarding recent developments, banks did not see any systematic increase in risk-taking by hedge funds. Leverage levels seemed to be moderate and lower than at the time of the near-default of LTCM, even though funds of hedge funds were reported to be increasing leverage.

The report also addresses a number of supervisory issues arising from banks as counterparties to transactions with hedge funds and banks as investors in hedge funds. These supervisory issues pertain mostly to banks' risk management practices and capital requirements tied to their hedge fund exposures. As regards risk management, both supervisors and the financial industry have developed guidance to address the specific risk concerns. Nevertheless, one should remain vigilant

to new developments that might require an update of this guidance. As regards capital requirements, it has been proven that hedge funds exposures can also be fitted into the general solvency framework, although the current and forthcoming rules do not provide for any specific treatment of such exposures.

The main policy conclusions of the BSC study can be summarised as follows. First, the survey results indicate that recent developments in the hedge fund industry may not necessarily pose a direct threat to financial stability in the EU through banks' direct exposures to hedge funds. Nonetheless, banks may also be affected indirectly, for example, if hedge fund activities lead to dislocations in financial markets or cause strains for major non-EU prime brokers with spillover effects to EU banks. Hence, direct exposures may underestimate the true risks that hedge funds pose to banks.

Second, the main recommendation put forward by public authorities in the aftermath of the LTCM case – according to which adequate management by banks of risks associated with hedge funds should be put in place – still remains relevant for large EU banks, as specific areas of risk management offer scope for further improvement. More generally, the survey evidenced the difficulties for banks to estimate hedge fund risks in an exhaustive way. The still limited transparency of hedge funds – taken together with the complex interactions of credit, liquidity and market risks – makes addressing hedge fund risks by banks particularly complex. As a minimum, however, banks should be able to aggregate their overall exposure to individual hedge funds and limit exposures to prudent levels.

Third, risk management guidance developed by supervisors and the capital adequacy regime provide the appropriate framework for dealing with risks resulting from banks' interactions with hedge funds. In particular the supervisory review process provided for under Basel II allows supervisors to take the measures necessary to address such risks, including additional capital requirements.

INTRODUCTION

In recent years the hedge fund industry has expanded rapidly. Because of the important role that hedge funds play as participants in financial markets and as counterparties to financial institutions, especially banks, monitoring their activities and assessing the implications for financial stability has become increasingly relevant. In this vein, the Banking Supervision Committee (BSC) of the European System of Central Banks (ESCB), with the assistance of its Working Group on Macro-Prudential Analysis (WGMA), decided to investigate the nature and relevance of links between EU banks and (funds of) hedge funds, given the important role that banks play in hedge fund operations.

Recently there has been an initiative undertaken by the Counterparty Risk Management Policy Group (CRMPG), an international industry group, to review earlier recommendations that had been made on counterparty risk management practices at the largest financial institutions. The group's first report (CRMPG I)¹ was prepared in June 1999 as the financial industry's response to the near-collapse of LTCM in September 1998. The motivation for an update (CRMPG II), which was finalised at the end of July 2005, was driven by the impressive proliferation of hedge funds and complex financial instruments.²

During 2004, independent examinations of selected banks' exposures to hedge funds were carried out in three EU countries (United Kingdom, France and the Netherlands). These investigations were targeted primarily at major banks that were known to have extensive dealings with hedge funds. The UK's FSA findings on prime brokerage activities were presented in a series of reports and at the Financial Stability Forum (FSF) meeting in Tokyo on 10 March 2005. Furthermore, the US Federal Reserve has also recently reviewed banks' management of hedge fund credit risk in relation to the recommendations made by supervisors and the CRMPG I in 1999.³

Against this backdrop and given the substantial general interest in hedge funds, the results of the

BSC survey should contribute to a better understanding of EU banks' practices in doing business with hedge funds as well as the possible implications for financial stability.

In addition to this introductory section, the report consists of four more sections and is structured as follows. Section 1 gives an overview of why the analysis of banks' exposures to hedge funds is important for financial stability. Section 2 reports on the survey results, including a description of received information, an overview of the findings on banks' exposures to hedge funds and a discussion on risk management issues. Section 3 provides an overview of supervisory issues arising from banks' exposures to hedge funds. The report ends with some preliminary conclusions and a discussion on possible policy implications.

I BANKS, HEDGE FUNDS AND FINANCIAL STABILITY

It is widely acknowledged that hedge funds – through their active risk-taking, provision of liquidity, elimination of market inefficiencies and potential enhancements to investment diversification – can contribute to the efficiency, integration and even stability of the global financial system. Moreover, hedge funds have changed the asset management industry and, according to one scenario, over time the differences between them and traditional funds may become blurred.

Nonetheless, the recent rapid growth of the hedge fund industry also raises important questions about possible negative implications for financial stability. Hedge funds could affect financial stability through their potential impact on financial markets or via their largest creditors and counterparties, i.e. banks. These two channels are closely linked and a hedge fund-related triggering event associated with either of them could be further reinforced by these mutual links. The

- 1 Counterparty Risk Management Policy Group (1999), "Improving Counterparty Risk Management Practices", June.
- 2 Counterparty Risk Management Policy Group (2005), "Toward Greater Financial Stability: A Private Sector Perspective", July.
- 3 Greenspan, A. (2005), "Risk Transfer and Financial Stability", May.

memorable episode of the near-default of LTCM in September 1998 provides the most vivid example of how hedge funds have the potential to disrupt the functioning of global financial markets. The financial community was surprised by the sheer size of the leverage underlying LTCM positions and, in particular, by the fact that banks had facilitated the building-up of such positions. An important insight made since then is that banks, because they are key hedge funds' trading counterparties and lenders, constitute an important channel for influencing the behaviour of hedge funds. This means that if banks manage their exposures to hedge funds prudently, then the potential risks for financial stability arising from hedge fund activities should be lower.

In this report, the focus is therefore on the bank channel. Banks' direct exposures to hedge funds are the most obvious way in which hedge funds could cause financial stability concerns. These direct exposures can be broadly grouped into four categories: *financing, trading, investment and income exposures*. Complex hedge fund operations and active investment strategies require considerable operational support and financing, and involve substantial trading volumes. Banks are keen to provide such services and many of them have developed prime brokerage platforms, which, among other services, facilitate the financing, risk management, execution, clearance and settlement of transactions for hedge funds and other professional market participants. For prime brokers, financing and trading exposures constitute the biggest source of risk, especially

given the complexity associated with the management of such exposures. Moreover, given that prime brokerage activities are concentrated among a limited number of large global players (see Box 1), a serious mismanagement of these exposures at an individual large bank or group of banks could lead to a systemic crisis via contagion effects on other banks and ripple effects on financial markets.

The interplay between banks and hedge funds is not limited to banks' direct exposures and potential losses arising from such exposures. Banks also face indirect exposures related to their exposures to other hedge fund counterparties and the impact of hedge fund activities in financial markets on their proprietary trading portfolios.

Banks, investors and hedge funds themselves have learned lessons from the near-collapse of LTCM. As a result, another high impact failure of a large hedge fund is probably less likely now, especially as more players have entered the market and positions are probably much less concentrated in one or a few funds than was the case at that time. Furthermore, the largest hedge funds now usually have diversified portfolios across several strategies.

Recently, however, concerns have also been expressed that, as the number and assets under management of hedge funds using similar strategies increases, the positioning of individual hedge funds is becoming more similar; there is therefore a concern that the resulting "crowding of

Box 1

PRIME BROKERAGE MARKET STRUCTURE

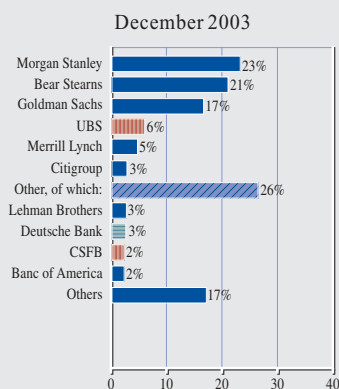
Based on available market information, there are at least four large EU prime brokers, namely Deutsche Bank, Société Générale, Barclays and SEB; although some other German, French, UK, Dutch, Belgian and Scandinavian banks also have a foot in the prime brokerage market. Nevertheless, the global market for prime brokerage services is dominated by three US entities (Morgan Stanley, Goldman Sachs and Bear Stearns), which control more than half of hedge fund capital under management (see Charts below). Two Swiss banks, namely CSFB and UBS, are important prime brokers too. Prime brokerage services, financing and trading

with hedge funds are highly specialised activities, whereas investments in hedge funds are accessible to a broader range of financial institutions. As a result, most EU banks that have an exposure to hedge funds have only investment exposures, whereas financing and trading activities are largely concentrated among a rather limited number of the largest EU banks with significant trading activities on their own.

Prime brokerage market structure

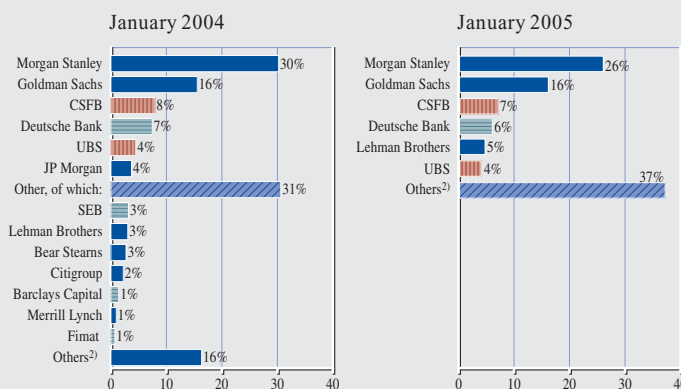
(% of hedge fund assets under management)

Global prime brokerage league



Source: HedgeWorld's Accredited Investor.

European¹⁾ hedge fund prime brokers



Source: EuroHedge.

1) As defined by EuroHedge, does not include managed futures funds.
2) Including funds which have no prime broker or have not disclosed.

trades” could pose a significant risk for financial markets (and banks’ proprietary positions) in the event of synchronous hedge fund exits.⁴ Sometimes banks’ trading desks use the same investment strategies as hedge funds and, therefore, may also be vulnerable to the adverse market dynamics caused by crowded trades.

Moreover, as noted in CRMPG II, crowded trades or active and leveraged hedge fund participation can dampen volatility and increase perceived liquidity in certain markets, thus leading to artificially low value-at-risk (VaR)⁵ numbers, including liquidity-adjusted VaR. Indeed, hedge funds are reported as accounting for 15-30% of the trading volume in some credit markets and more than 80% of trading in distressed debt,⁶ thus increasing the perceived liquidity in these markets. However, if market participants try to unwind their positions in times of stress, this perceived liquidity could easily evaporate. Moreover, in the latest

financial reports, many banks reported higher VaR values. Even though these values were not high in relation to the banks’ capital, this fact raises some concerns that banks may underestimate the true risks of the current environment characterised by low interest rates, low volatility and high perceived liquidity.

4 See ECB (2005), Financial Stability Review, June; UK’s FSA (2005), “Hedge Funds: a Discussion of Risk and Regulatory Engagement”, Discussion Paper, No 4, June; Counterparty Risk Management Policy Group (2005), “Toward Greater Financial Stability: A Private Sector Perspective”, July.
5 The VaR or Value at Risk is the estimated maximum potential loss to a portfolio over a given time period (e.g. ten trading days) at a given level of confidence (e.g. 99%).
6 See Greenwich Associates (2005), “Hedge Funds: The End of the Beginning?”, January.

2 SURVEY RESULTS

2.1 BACKGROUND INFORMATION

2.1.1 COVERAGE

In order to investigate the links between EU banks and hedge funds, a survey was conducted under the auspices of the BSC with a dedicated focus on EU banks. Thus, the survey excluded subsidiaries and branches of non-EU banks. To avoid double-counting, the qualitative information and consolidated cross-border, cross-sector data (i.e. consolidated both across borders and across the different financial sectors where the bank was active) were reported by the country where the ultimate EU parent bank was located.

Preliminary contacts with banks and supervisory information had indicated that only a limited number of large banks – defined as banks with cross-border, cross-sector consolidated assets above €120 billion – could possibly have exposures to hedge funds. These banks were also quite often found to be providing prime brokerage services to hedge funds. On the basis of this prior information, national authorities sent out the questionnaire to, or contacted in other ways, more than 100 banks (some smaller countries also included smaller banks or subsidiaries of EU banks). It turned out that of those, more than 40 had some direct exposures to hedge funds and they provided comments on their connections with hedge funds. However, the number of banks with more significant exposures to hedge funds was much smaller as many of the banks that replied had mainly investments in hedge funds.

In total, 14 countries submitted their replies to the qualitative part of the survey (AT, DE, DK, ES, FR, GR, IT, LU, NL, PT, SE, SI, SK, UK). In the remaining EU countries, banks either did not have exposures to hedge funds or these were considered negligible. Even in some of the countries that provided qualitative inputs, banks' exposures were insignificant and mostly in the form of investments. Only banks in DE, ES, FR, NL, SE and UK appeared to have more significant financing and trading links with hedge funds. Based on the coverage information provided,

35 surveyed banks that provided or were covered in the answers to the qualitative part of the survey (including 11 smaller banks with mainly investment exposures) in AT, DE, ES, FR, NL, PT and SE as a group constituted around 1%, 55% and 38% of respectively the total number, consolidated assets and Tier 1 capital⁷ of all eligible banking groups in these countries. The coverage in individual countries ranged within 0-12% of the total number of institutions, 23-95% of consolidated assets and 21-87% of Tier 1 capital.

Reporting samples for the different sections of the quantitative part of the questionnaire varied substantially as banks were asked to provide information on a best effort basis. Some quantitative data was supplied by 22 large banks from seven countries (AT, DE, ES, FR, NL, PT and SE). Most banks provided only 2004 data, whereas six large banks from four countries (AT, ES, FR and SE) also provided some quantitative data for 2003. Such fragmented reporting complicated the analysis and aggregation of data and limited its possible use for this report, as some information referred to a very small number of banks.

2.1.2 DEFINITION OF A HEDGE FUND USED BY BANKS

For the purposes of the survey, the following definition of a hedge fund was suggested: *“a fund, whose managers receive performance-related fees and generally have no or very limited restrictions on the use of various active investment strategies to achieve positive absolute returns. Such strategies often involve leverage, derivatives, long and short positions in securities or any other assets.”* The survey replies indicated that internal definitions used by banks broadly corresponded with such characterisation (see Annex 1 for the list of definitions provided). None of the countries had mentioned that banks had substantial difficulty in identifying hedge funds among the wide spectrum of alternative investment vehicles, although for some banks the lack of a precise definition could have posed difficulties for their risk management on a global basis.

⁷ Tier 1 or core capital is regulatory capital that consists of own funds components of the highest quality, such as fully paid-up capital and disclosed reserves from post-tax retained earnings.

2.1.3 INFORMATION AVAILABLE TO NATIONAL AUTHORITIES

Generally, countries had several sources of information on banks' links with hedge funds. First, very large investments in, or large loans extended to, hedge funds would appear in supervisory reporting of large exposures. Second, countries having credit registers have another possibility of obtaining information on larger credit exposures and on loans to hedge funds. It should be noted, however, that there is a problem with the first two information sources related to the difficulty of distinguishing hedge funds from other entities. Furthermore, information on collateralisation is not always included in these information sources. The third information source is the supervisory process itself, which provides a number of opportunities for discussing hedge fund-related issues, tailored to the circumstances of a particular bank. These include regular prudential meetings, management interviews, on-site inspections, auditors' analytical reports and ad hoc calls or surveys. Fourth, banks are obliged to report to supervisors their direct participations, including, for example, acquisitions of hedge fund management firms, and sometimes also details on their investment portfolios.⁸

Based on the survey replies, it seems that countries generally have limited information on banks' exposures to hedge funds. In most cases, the lack of regular dedicated reporting or monitoring is justified by the minimal size of such exposures. In other cases, a greater reliance is placed on ad hoc information gathering, which provides a first indication on the linkages between banks and hedge funds. This might later be replaced by a more systematic approach, especially if exposures and potential (systemic) risk arising from them continue to grow. As mentioned in the introduction, the latest initiative by the UK authorities and one-off investigations by authorities in FR and NL are a step in this direction. Nevertheless, it is important to note that any possible regular data collection initiatives should not be misinterpreted as active regulation where none exists.

2.2 BANKS' EXPOSURES TO HEDGE FUNDS

2.2.1 BANKS' MOTIVATION FOR DEALING WITH HEDGE FUNDS

According to the banks surveyed, the main reasons for dealing with hedge funds are the growth of income and the diversification of income sources, which is not surprising as dealing with and servicing hedge funds is usually a lucrative business. The interest in hedge funds from an investment perspective was driven by their attractive risk-return profile, uncorrelated with other major asset classes.

The second group of motives is associated with demand factors. Lately, high-net-worth individuals and institutional investors have been seeking exposure to hedge funds and, in response to that, banks have been either offering their own or third-party hedge funds or selling structured hedge fund products to these investors. For some banks, hedge funds have been clients for a long time and servicing them has been an important business line. However, some of the interviewed banks indicated that they did not have any ambition to become fully-fledged prime brokers because positions of established prime brokers were too strong and entry costs were too high. The EU hedge fund industry, encompassing hedge funds either managed from or domiciled in the EU, accounts for 20-30% of the global hedge fund capital under management and is growing faster than the industry as a whole.⁹ As a result, the demand for hedge fund-related services, bank trading with and investments in hedge funds may be expected to increase further.

The third reason given by banks for dealing with hedge funds is that some saw trading with hedge funds as a way of providing their proprietary trading desks with greater trading possibilities and greater liquidity, especially as hedge funds are widely known as active risk-takers and significant providers of liquidity.

⁸ In NL, for example, there is a quarterly reporting of bank investments in alternative (non-traditional) assets, although hedge funds are not specifically singled out.

⁹ See Garbaravicius, T. and F. Dierick (2005), "Hedge Funds and Their Implications for Financial Stability", ECB Occasional Paper No 34, August.

Finally, the last broad rationale for banks is the market intelligence that can be obtained as part of the trading process, given that hedge funds have become increasingly significant players in domestic and international financial markets.

Other more specific reasons included the use of hedge funds as hedges for financial derivatives or structured products sold to customers. Some banks also mentioned that dealing with hedge funds involved the valuable transfer of technical know-how and product information.

Some hedge funds would probably welcome the opportunity to acquire all services from the same integrated provider, thereby inducing banks to provide all hedge fund-related services, including, for example, prime brokerage, custody and administration. Thus, banks with a strong base in one of these areas might logically attempt to foster other complementing areas.¹⁰

2.2.2 BANKS' EXPERIENCE OF DEALING WITH HEDGE FUNDS AND TYPES OF SERVICES PROVIDED

Based on the data provided, nearly half of the large banks that provided some quantitative data had started their dealings with hedge funds on a permanent and sizable basis more than six years ago (see Chart 1). However, one-third of banks were rather recent entrants into the hedge fund market,

and this could have an impact on the quality of their risk management of exposures to hedge funds owing to the complexity of such exposures and the time needed to acquire some minimum experience.

Only five out of 20 of the large banks identified themselves as prime brokers. All of these five institutions were involved in equity prime brokerage, four in synthetic and derivatives prime brokerage and two of them offered fixed income prime brokerage.

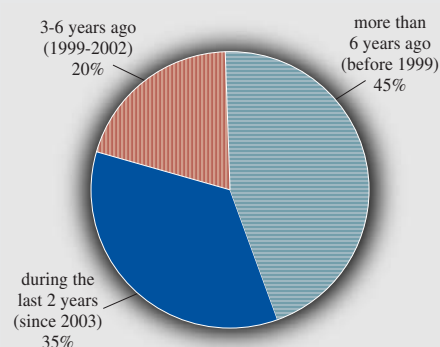
Most of the banks invested their own money in hedge funds, and substantially more banks made allocations to funds managed by unconnected management firms rather than by the bank or its subsidiaries. For investors, however, more banks offered investments in hedge funds or structured hedge-fund products managed/created by themselves rather than by unconnected entities.

Cash and securities lending were the two most common types of services offered to hedge funds; although trade execution, clearance and settlement, custody and fund administration services were also often provided to hedge fund clients (see Chart 2).

¹⁰ For example, one large EU bank has a strong base in fund administration business and wants to develop itself more in a direction of a prime broker, although currently its financing portfolio consists mostly of lending to funds of hedge funds.

Chart 1 Banks' experience of dealing with hedge funds

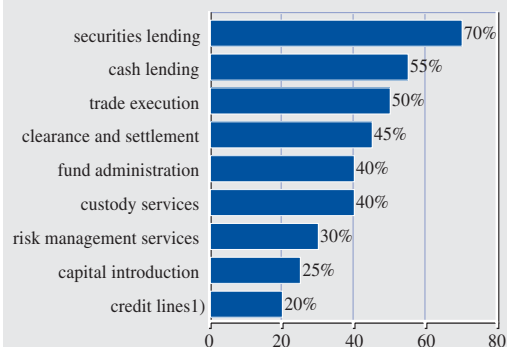
(% of total; 20 large banks from 7 countries)



Source: BSC.

Chart 2 Types of services provided to hedge funds

(% of total, answers not mutually exclusive; 20 large banks from 7 countries)



Source: BSC.

¹⁾ Unsecured short-term liquidity facilities.

2.2.3 DIRECT EXPOSURES

As mentioned above, it is useful to distinguish between four different types of direct exposures that banks can have to hedge funds. First, *financing exposures* arise from lending to hedge funds (repurchase agreements and other arrangements) or from credit lines for unexpected liquidity shortages. Second, *investment exposures* occur when banks make investments in hedge funds managed either by the bank (including subsidiaries) or by unconnected management firms. A third type of direct exposures, *trading exposures*, arises from trading in OTC (over the counter) markets and is closely related to financing exposures, as both types involve credit (counterparty) risk. Finally, *income exposures* are associated with the dependence on revenue derived from hedge funds.

A broad picture of banks' exposures to hedge funds can be formed using information available in commercial hedge fund databases. In addition to various hedge fund characteristics, such as capital under management and returns, these databases also make available the names of various service providers, including prime brokers. An example of such an analysis is presented in Table 1 and Table 2, which give some indication of the magnitude, concentration and risk of exposures to hedge funds by selected EU prime brokers.¹¹ This analysis could also be used by supervisors as a starting point for a more detailed examination of banks' dealings with hedge funds.

11 For the global picture, see Garbaravicius, T. and F. Dierick (2005), "Hedge Funds and Their Implications for Financial Stability", ECB Occasional Paper No 34, August.

Table 1 Concentrations and exposures of selected EU prime brokers by the number of hedge funds

(number of hedge funds; December 2004)

Selected EU prime brokers (sorted by total capital under management of hedge funds)	group	sub	sub	sub	sub	sub	group sub	group	sub	sub	sub
	Directional strategies	Long/ Short Equity Hedge	Dedicated Short Bias	Global Macro	Emerging Markets	Managed Futures	Event Driven strategies	Market Neutral strategies	Fixed Income Arbitrage	Convertible Arbitrage	Equity Market Neutral
ABNAMRO	48	37	2	1	7	1	18	2			2
Deutsche Bank	31	23		3	2	3	11	21	1	8	12
MAN Group	36			5		31	1	1			1
Crédit Agricole	27	1		7		19		2	1	1	
Barclays								6	3		3
SEB	4	3		1							
Banque Populaire	3	3					2				
HSBC											
KBC								1	1		
Bank of Ireland	3	1			1	1					
Société Générale	26	2		1		23		2			2
ING	9	8			1		5				
Dexia											
Nordea Bank	2	2									
EFG Eurofinancière d'Investissements											
Allianz	2			2							
Fortis	2	1				1		1		1	
Banque de Gestion Edmond de Rothschild											
Lichtenstein Landesbank	1			1							
Jyske Bank AG								1	1		
Selected EU prime brokers	194	81	2	21	11	79	37	37	7	10	20
Others (including undisclosed)	1,340	928	16	110	142	144	249	415	142	114	159
Total number of hedge funds in the database	1,534	1,009	18	131	153	223	286	452	149	124	179
Selected EU prime brokers, % of total	13	8	11	16	7	35	13	8	5	8	11
CR1 of selected EU prime brokers, %	25	46	100	33	64	39	49	57	43	80	60
CR3 of selected EU prime brokers, %	59	84	100	71	91	92	92	78	71	100	85
Volatility, % ¹⁾	-	10.6	17.7	11.6	17.0	12.2	5.8	-	3.8	4.7	3.0

Sources: Lipper TASS database (30 June 2005 version) and ECB calculations.

Notes: Only funds with reported (estimated) capital under management. If several prime brokers were provided by a hedge fund, then only the first indicated prime broker was used in calculations.

CR1 - the share (concentration ratio) of the largest prime broker or sub-strategy.

CR3 - the share (concentration ratio) of the three largest prime brokers or sub-strategies.

Leverage – the database manager guides hedge funds to provide the ratio of the hedge fund portfolio to equity multiplied by 100. Based on this guidance, a ratio of 200 indicates that the hedge fund portfolio is twice as large as its capital under management. Some hedge funds indicate that they use leverage, but state that their average or maximum leverage is zero. To accommodate for this, a special data group has been created and labelled "leverage 0".

1) CSFB/Tremont Hedge Fund Index and sub-indices, annualised standard deviation of monthly returns, January 1994-December 2004.

group sub	group sub	Total number	Distribution of leverage											Distribution of size		
			sub %	sub %	Do not use leverage %	average leverage				maximum leverage				≤ \$100m	-\$1bn	> \$1bn
						0	≤ 100	100-200	> 200	0	≤ 100	100-200	> 200			
Other (Multi-Strategy)	Fund of Funds	CR1 of sub-strategies	CR3 of sub-strategies	Do not use leverage	0	≤ 100	100-200	> 200	0	≤ 100	100-200	> 200	≤ \$100m	-\$1bn	> \$1bn	
	4	72	51	86	32	31	17	21		22	15	28	3	64	35	1
1	3	67	34	69	37	25	16	18	3	19	12	16	15	63	37	
1	15	54	57	94	17	33	39	6	6	35	30	6	13	72	26	2
	5	34	56	91	12	24	50	6	9	18	56		15	56	38	6
1		7	43	100		29	14	43	14	29	14	29	29	29	71	
	4		75	100		75		25		25		25	50		75	25
	2	7	43	100	43	57				29	29			43	57	
1	14	15	93	100	13	87				60	27			67	33	
	5	6	83	100	17	17	67			17	67			33	67	
	7	10	70	90	60	30		10		30			10	60	40	
5	4	37	62	86	5	38	38	11	8	35	27	14	19	97	3	
		14	57	100	29	29	36	7		14	43	14		79	21	
	4	4	100	100		100					100			50	50	
		2	100	100		100				50	50				100	
	2	2	100	100	50	50				50				50	50	
		2	100	100		50			50	50			50	50	50	
		3	33	100		33	33	33			33	67		67	33	
	1	1	100	100	100										100	
		1	100	100		100					100			100		
		1	100	100					100				100	100		
9	66	343	24	66	24	35	25	13	4	26	26	13	11	65	33	1
107	810	2,921	32	68	42	27	12	12	7	20	11	14	13	67	31	2
116	876	3,264	31	67	40	28	13	12	7	20	13	14	13	67	31	2
8	8	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	23	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-
78	55	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.4	-	8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2 Concentrations and exposures of selected EU prime brokers by the capital under management of hedge funds

(USD billion; December 2004)

Selected EU prime brokers (sorted by total capital under management of hedge funds)	group	sub	sub	sub	sub	sub	group sub	group	sub	sub	sub
	Directional strategies	Long/ Short Equity Hedge	Dedicated Short Bias	Global Macro	Emerging Markets	Managed Futures	Event Driven strategies	Market Neutral strategies	Fixed Income Arbitrage	Convertible Arbitrage	Equity Market Neutral
ABNAMRO	6.9	6.3	0.0	0.0	0.5	0.1	3.8	0.1			0.1
Deutsche Bank	4.5	3.6		0.0	0.8	0.1	1.1	2.9	0.0	1.4	1.5
MAN Group	3.9			0.3		3.5	0.7	0.0			0.0
Crédit Agricole	4.0	0.1		0.5		3.4		0.3	0.3	0.0	
Barclays								1.5	1.2		0.3
SEB	1.9	1.3		0.7							
Banque Populaire	0.5	0.5					0.7				
HSBC											
KBC								0.2	0.2		
Bank of Ireland	0.4	0.1			0.2	0.0					
Société Générale	0.9	0.0		0.0		0.9		0.1			0.1
ING	0.4	0.3			0.0		0.5				
Dexia											
Nordea Bank	0.4	0.4									
EFG Eurofinancière d'Investissements											
Allianz	0.2			0.2							
Fortis	0.2	0.2				0.0		0.0		0.0	
Banque de Gestion Edmond de Rothschild											
Lichtenstein Landesbank	0.0			0.0							
Jyske Bank AG								0.0	0.0		
Selected EU prime brokers	24.2	12.8	0.0	1.8	1.5	8.0	6.8	5.1	1.8	1.4	2.0
Others (including undisclosed)	161.7	110.7	0.9	16.0	21.3	12.9	53.5	68.6	30.6	20.5	17.5
Total capital of hedge funds in the database	185.9	123.5	0.9	17.8	22.8	20.9	60.3	73.7	32.4	21.9	19.5
Selected EU prime brokers, % of total	13	10	2	10	7	38	11	7	5	6	10
CR1 of selected EU prime brokers, %	29	49	100	36	51	44	56	56	71	97	77
CR3 of selected EU prime brokers, %	64	87	100	84	97	97	82	92	99	100	95
Volatility, % ¹⁾	-	10.6	17.7	11.6	17.0	12.2	5.8	-	3.8	4.7	3.0

Sources: Lipper TASS database (30 June 2005 version) and ECB calculations.

Notes: Only funds with reported (estimated) capital under management. If several prime brokers were provided by a hedge fund, then only the first indicated prime broker was used in calculations.

CR1 - the share (concentration ratio) of the largest prime broker or sub-strategy.

CR3 - the share (concentration ratio) of the three largest prime brokers or sub-strategies.

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1) CSFB/Tremont Hedge Fund Index and sub-indices, annualised standard deviation of monthly returns, January 1994-December 2004.

group sub	group sub	Total capital	Distribution of leverage											Distribution of size			
			sub %	sub %	Do not use leverage %	average leverage			maximum leverage				≤ \$100m	-\$1bn	> \$1bn		
						0	≤ 100	100-200	> 200	0	≤ 100	100-200				> 200	
Other (Multi-Strategy)	Fund of Funds	CR1 of sub-strategies	CR3 of sub-strategies	Do not use leverage	0	≤ 100	100-200	> 200	0	≤ 100	100-200	> 200	≤ \$100m	-\$1bn	> \$1bn		
	0.3	11.1	57	96	18	39	14	30		25	18	34	4	15	74	11	
	0.2	9.0	40	72	36	20	12	26	6	22	5	9	28	15	85		
	0.0	6.9	51	95	20	37	27	8	7	48	22	2	9	12	60	28	
	2.0	6.3	53	93	28	34	16	8	13	36	13		22	9	56	35	
	0.9	2.4	52	100		46	6	45	3	46	6	42	6	6	94		
		1.9	66	100		66		34		6		5	88		45	55	
	0.5	1.7	40	100	63	37				32	5			7	93		
	0.0	1.6	100	100	46	54				40	14			12	88		
	1.1	1.2	86	100	14	39	47			39	47			5	95		
	0.8	1.2	69	99	56	34		10		34			10	22	78		
	0.0	0.1	1.2	78	97	1	54	31	9	5	53	24	8	14	62	38	
		0.9	60	100	29	29	37	5		23	39	9		52	48		
	0.5	0.5	100	100		100					100			13	87		
		0.4	100	100		100				66	34				100		
	0.3	0.3	100	100	14	86				86				14	86		
		0.2	100	100		9				91	9		91	9	91		
		0.2	88	100		88	3	9			3	97		12	88		
	0.2	0.2	100	100	100										100		
		0.0	100	100		100					100			100			
		0.0	100	100									100	100			
	1.1	10.1	47.3	27	65	25	38	15	18	5	32	15	13	15	14	72	14
	26.5	105.6	415.9	27	65	40	29	10	10	11	22	11	11	16	15	65	21
	27.6	115.7	463.3	27	65	38	30	10	11	10	23	11	11	16	15	66	20
	4	9	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	83	23	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	100	59	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4.4	-	8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Financing exposures

Two forms of hedge fund financing may be distinguished: bridge (liquidity) financing and normal cash or security lending for gearing. The former is designed to allow hedge funds:

- to manage unexpected liquidity shortages of various origins;
- to remain fully invested (minimising cash drag);
- to smooth out timing mismatches of proceeds related to investor subscriptions and redemptions; and
- to not miss attractive investment opportunities when all available funds are fully invested.

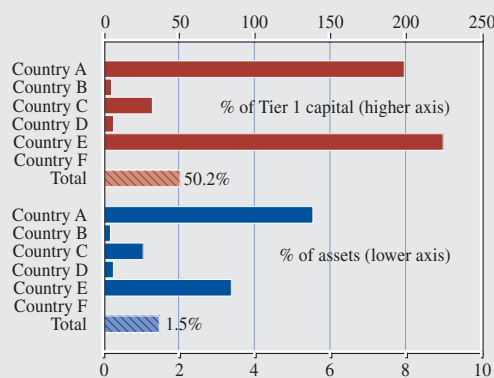
The last option is particularly important for funds of hedge funds, as the opportunity to invest in otherwise closed funds must be accepted at short notice.

The survey found that some banks explicitly prohibit outright credit to hedge funds. As lending to hedge funds is a balance-sheet-intensive activity, it was not surprising that smaller banks or banks that were not prime brokers usually had minor financing exposures.

Size and growth. At the end of 2004, for the 14 large banks from six countries (AT, DE, ES, FR, NL and SE) cash lending to hedge funds collateralised with securities (e.g. via reverse repurchase agreements) amounted to 1.5% of surveyed banks' assets and 50.2% of their Tier 1 capital.¹² Across countries, the ratios ranged from 0% to 5.5% of assets and from 0% to 224% of Tier 1 capital (see Chart 3). The maximum possible amount of credit lines available to hedge funds stood at 0.6% of assets and 17.3% of Tier 1 capital for the smaller sample of banks (excluding one large country), and it varied substantially across countries from negligible levels to up to 1.1% of assets and 32% of Tier 1 capital. The absolute amount of collateralised cash lending to hedge funds was almost €100 billion (€99.3 billion) and large banks from two countries

Chart 3 Cash lending to hedge funds collateralised with securities

(% of Tier 1 capital and assets; 14 large banks from 6 countries)



Source: BSC.

clearly dominated in the sample. For the smaller samples of banks, which also provided 2003 data, the lending and maximum possible amount of credit lines had increased 1.5 and 1.3 times respectively in 2004.

Maturity. Banks provided very little information on the maturity breakdown of lending, but the data received from two banks confirmed that cash lending to hedge funds was very short-term and more than 80% of obligations were to become due in less than one month.

Unsecured lending. It should also be noted that, in general, banks extended no or only minimal unsecured lending and many banks had policies completely forbidding the extension of unsecured lending. Cash lending was usually fully collateralised and sometimes even significantly over-collateralised on a marked-to-market basis. Nearly all unsecured credits were concentrated among a few banks and did not exceed €85 million at the end of 2004.

¹² One large bank provided some information only for June 2005, but its numbers, when provided, were included in calculations referring to the end of 2004.

Box 2

PRIME BROKERAGE BASICS

Historically, prime brokerage has developed from collateralised equity and bond financing, though more often it originated from the equity side of banks' business. Collateralised security financing remains at the core of prime brokerage operations and it involves (i) stock or bond lending and (ii) cash lending against stock or bond collateral. Cash lending is usually implemented via reverse repurchase agreements (re-repos) and security lending through repurchase agreements (repos). The maturity of reverse repurchase agreements is usually overnight and they can be continuously rolled over until the termination of financing.

In prime brokerage, all positions are broken down into longs and shorts. Then posted cash balances are added to the difference between the market value of longs and shorts and the resulting equity margin (or equity in account) is compared against the minimum margin (house requirement) to calculate margin excess/deficit.

$$\begin{array}{r}
 + \text{ Long market value} \\
 - \text{ Short market value} \\
 + \text{ Cash balances} \\
 \hline
 \text{Equity margin} \\
 - \text{ Minimum margin} \\
 \hline
 \text{Margin excess/deficit}
 \end{array}$$

There is a wide variation among prime brokers as to how they determine minimum margin, which is increasingly based on VaR calculations across all positions. In portfolio-based margining, the addition of a hedging (risk reducing) position would give back initial margin, although individual haircuts on products would still remain additive. In the case of margin lock-ups, certain pre-agreed parameters and correlations are fixed for a given period, so that hedge funds can calculate the margin numbers themselves.

A key feature of prime brokerage is that it provides a centralised platform and, very importantly, one consolidated margin (collateral) for all dealings with and services provided to hedge funds. In response to client demand, banks bring increasingly more OTC trading and other products onto this platform, thereby effectively disbanding the silo-approach used before and combining prime brokerage with trading desks. For example, in April 2005 one large EU bank announced that Global Prime Services had moved FX, credit and fixed income products onto its platform, as hedge fund clients were looking for a fuller range of products.

Types of collateral. Stocks and bonds were the two most common types of collateral (see Box 2) in hedge fund financing. The relative shares of bond and equities varied depending on banks' business profiles, but bonds seemed to dominate with an 80-100% share for a few banks that provided such

information. In the case of lending to funds of hedge funds, the practices were less uniform, but usually the underlying investments in single hedge funds were used as collateral and the overriding rationale behind leveraging was to amplify the diversification element of a portfolio. However,

even if funds of hedge funds were safer for investors, they could be riskier to lenders because shares of underlying hedge funds carry a subordinated credit status.

Breakdown by hedge fund size. Information from one large prime broker on credit exposures to hedge funds by size indicated that 60% of claims were on large hedge funds with more than €1 billion under management. The remaining 40% were claims on smaller hedge funds with more than €100 million under management. Moreover, the share of overnight credit was significant for large hedge funds, but negligible for smaller hedge funds, as most of their outstanding obligations were to mature within one month.

Breakdown by strategy. Data from three countries indicated that most credit exposures were concentrated in two broad strategy groups, namely market neutral and multi-strategy funds, which often have higher levels of leverage owing to the nature of their strategies (see Chart 4).

The total amount of cash lending can be compared with data from the Bank for International Settlements (BIS) on consolidated bank claims on private non-bank borrowers in offshore financial centres (see Chart 5). However, this comparison is

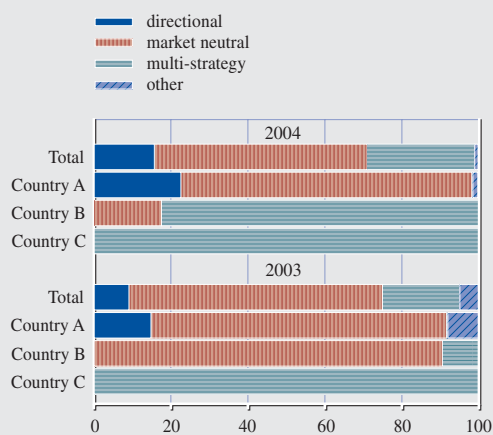
subject to reservations due to the fact that claims on non-banks may comprise substantial lending to special purpose vehicles and other non-hedge fund entities domiciled offshore. At the end of March 2005, the exposures of EU15 banks to non-banks in offshore centres constituted more than three-quarters of their total exposures to offshore financial centres and nearly half of all reporting banks' exposures to non-bank borrowers in offshore financial centres.

Lending spreads. In most cases, collateralised lending spreads over LIBOR or EURIBOR varied by the type of hedge funds and by collateral. However, they were generally the result of negotiations between a hedge fund and the bank, whereas the risk of lending was reflected in other credit or collateral terms. Such practice would imply that banks were largely price-takers in a highly competitive market and altered non-price terms to achieve reasonable risk-adjusted compensation. Some banks also mentioned that market competition was indeed an important pricing factor, but collateral terms were determined relatively independently of price.

Banks reported various spread ranges depending on their experience of dealing with hedge funds and the quality and liquidity of collateral provided as a

Chart 4 Credit exposures by strategy

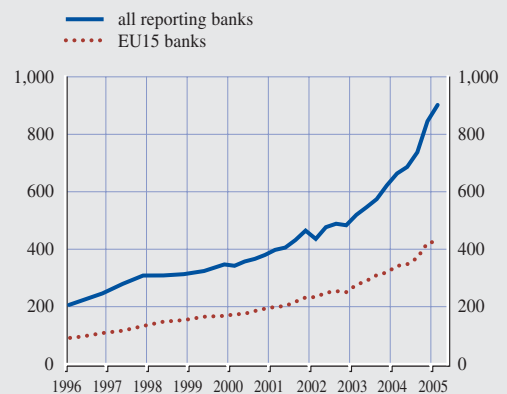
(% of total; 4 large banks from 3 countries)



Source: BSC.
Note: There were no credit exposures to event driven funds and funds of funds.

Chart 5 Consolidated bank claims on private non-banks in offshore financial centres

(USD billion; amounts outstanding; Q4 1995 - Q1 2005; quarterly data)



Source: BIS.

Table 3 Collateralised lending spreads and their evolution

(country summaries and individual bank replies)

Single hedge funds:

125-200 bps (basis points), depending on the type of fund and collateral.

For large, diversified hedge funds, 12 bps for high-grade bonds and 18 bps for high-yield bonds; dropped from respectively 17 and 25 bps during 2004.

25-75 bps for equity financing, no variation during 2004.

100-150 bps for collateralised loans and rather stable in 2004.

Average spreads for unsecured lending have increased in 2004.

50-75 bps.

10-300 bps, depending on the collateral. Individual banks reported that spreads had dropped since mid-2004, during 2004 or during the last few years.

Funds of hedge funds:

80-100 bps, tightened from 120 bps during 2004.

80-160 bps, spreads higher than for single hedge funds due to higher liquidity risks.

protection (see Table 3). Sometimes spreads also depended on the overall business volume and/or the range and complexity of services used by a particular hedge fund or the ability to use other lenders. Larger, more diversified funds were often able to command lower spreads than smaller ones.

With regard to the evolution of spreads, a number of banks indicated that they had actually declined over 2004, especially for lending to larger hedge funds, as competition in this segment was the most intense.

Investment exposures

As was mentioned before, in many EU countries investments in (funds of) hedge funds were the main and sometimes the only form of direct links with the hedge fund industry. Banks saw such investments as a way of gaining attractive risk-adjusted returns and improving the diversification of their investment portfolios. In smaller countries, risk management associated with these investments was quite often transferred to a parent institution, and frequently chosen (funds of) hedge funds were also managed by the entities from the same financial group.

At the end of 2004, the total amount of investments in hedge funds by 16 large banks from six countries (AT, DE, ES, FR, NL and SE) exceeded €9.4 billion,¹³ although most of them originated from large banks in two countries.¹⁴ More than half (51%) of this amount was invested in hedge funds managed by the entities of the originating banking

group, although in three countries investments in hedge funds were predominantly (sometimes exclusively) managed by firms unconnected to banks. Total investments constituted about 0.1% of assets and 4.3% of Tier 1 capital, although across countries these ratios varied from 0% to 0.3% of assets and from 0.1% to 8.6% of Tier 1 capital (see Chart 6). In 2004, total investments by a smaller sample of banks that also provided 2003 data increased by 52% and allocations to unconnected hedge funds grew much faster.

Banks highlighted performance (market), liquidity and fraud risks as the most important ones for their investments in hedge funds. In addition, they also mentioned a range of operational risks, which could be mitigated through careful due diligence: adequacy of risk management systems and business administration capabilities; technological (IT) risks; transparency; dependency on key manager(s); legal risks in case of disputes with hedge funds. In order to protect themselves from a prolonged decrease in net asset value (NAV)¹⁵, the redemption characteristics and liquidity profile of (funds of) hedge funds were also taken into account when conducting initial due

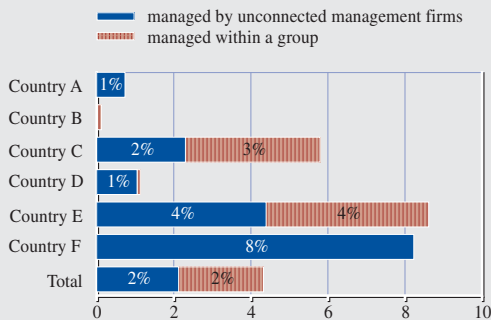
¹³ One large bank provided some information only for June 2005, but its numbers, when provided, were included in calculations referring to the end of 2004.

¹⁴ The addition of investments by smaller banks from one EU country would increase total reported investments by €0.9 billion.

¹⁵ Net asset value: the total value of the fund's portfolio less liabilities; also referred to as assets (capital) under management.

Chart 6 Investments in hedge funds

(% of Tier 1 capital; end-2004; 16 large banks from 6 countries)



Source: BSC.

diligence. Several banks were also concerned about catastrophic decreases in NAV in the event of widespread turbulence in financial markets, which could create “gap” risk¹⁶ for the rebalancing of structured hedge fund products. Sudden substantial increases in assets under management could also be a source of concern owing to strategy capacity limits. Some banks also underlined the risk of a “style drift”, i.e. the risk that the manager may change or abandon the stated primary strategy or strategies without informing investors.

Trading exposures

At the end of 2004,¹⁷ for five large banks from three countries (DE, FR and SE) the estimated gross

value¹⁸ of OTC contracts outstanding with hedge funds in derivatives made up 2.7 % of all outstanding banks’ OTC contracts in derivatives. In the case of OTC interest rate derivatives the share was 2.4% (ranges are presented in Chart 7). When measured by notional principal rather than by gross market value, hedge funds accounted for a much larger share of outstanding OTC contracts in derivatives.

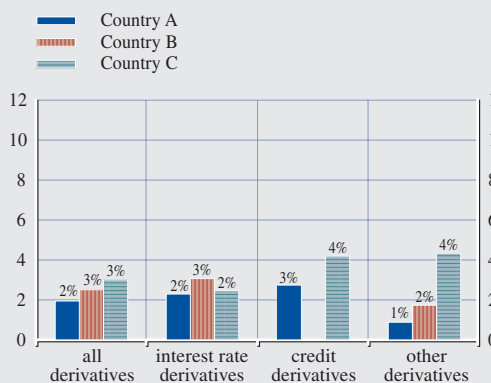
The structure of outstanding OTC contracts in derivatives by the type of instrument is provided in Chart 8, from which it is quite difficult to discern specific bank trading patterns with hedge funds in comparison with the overall trading structure, even though banks slightly tended to deal relatively more in interest rate derivatives with hedge funds and less in other, perhaps more exotic, derivatives.

One bank also provided data on trading volumes and, in 2004, trading with hedge funds accounted for 5% of overall trading in debt securities.

- 16 The risk that an investment’s price will change from one level to another with no trading in between. Usually such movements occur when there are adverse news announcements, which can cause an investment’s price to drop substantially from the previous day’s closing price.
- 17 One large bank provided some information only for June 2005, but its numbers, when provided, were included in calculations referring to the end of 2004.
- 18 Gross value refers to the pre-netting, pre-collateral marked-to-market value as the sum of both positive and negative (without minus sign) exposures.

Chart 7 Hedge fund share of OTC contracts in derivatives

(% of outstanding gross market value; end-2004; 5 large banks from 3 countries)



Source: BSC.

(% of total outstanding notional principal; end-2004; 3 large banks from 3 countries)

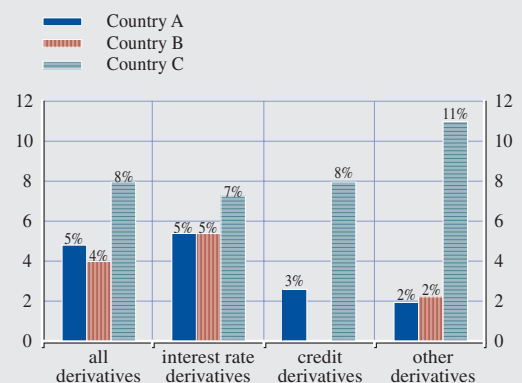
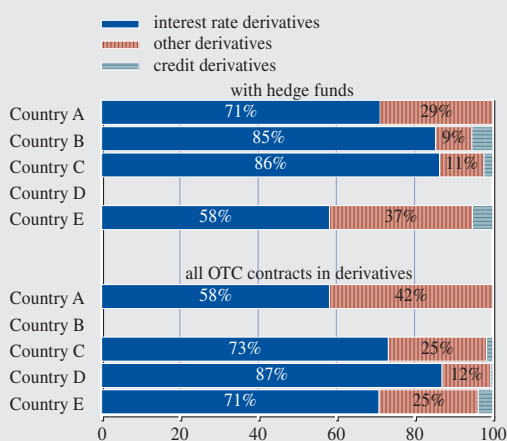
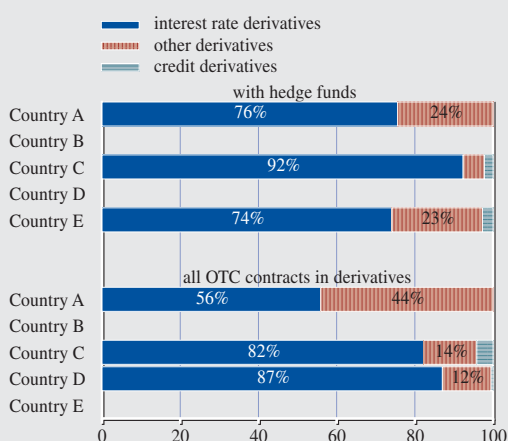


Chart 8 Distribution of OTC contracts in derivatives

(% of total outstanding gross market value; end-2004; 9 large banks from 5 countries)



(% of total outstanding notional principal; end-2004; 4 large banks from 4 countries)



Source: BSC.

However, the share of trading with hedge funds at this bank had increased in 2004 from 12% to 21% for all derivatives and from 4% to 18% for credit derivatives.

As regards markets in credit risk transfer (CRT) instruments, data from nine large banks in three countries suggested that hedge funds were net credit protection buyers from banks (in each country, 60%, 62% and 70% of contracts were related to the selling of credit protection to hedge funds) and based on other banks' comments it also looked as if banks mainly acted as net credit protection sellers to hedge funds. However, there were also qualitative comments that, on aggregate, the hedge fund industry was probably a net buyer of credit risk, i.e. net credit protection seller. Other banks reported that they (i) did not generally deal in CRT markets, (ii) did not trade in these products with hedge funds at all, (iii) did not have transactions in credit derivatives with hedge funds or (iv) did not normally use hedge funds as a counterparty and trading volumes with them in CDS (credit default swap) markets were very low. It was also mentioned that in CDO (collateralised debt obligations) markets, hedge funds were increasingly purchasing equity and mezzanine "tranches" of securitisations underwritten by banks.

Overall, it seems that in most cases hedge funds were not key counterparties for banks in CRT markets, but some banks confirmed that they had become important players in these markets and their importance was likely to increase. Despite the relative immaturity of CRT markets, they seemingly managed to withstand the test of GM and Ford downgrades and negative effects were rather well-contained, although some banks and hedge funds suffered huge losses.

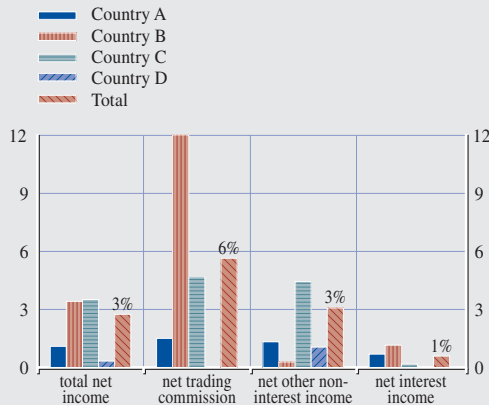
Income exposures

According to quantitative data from nine large banks from four countries (AT, FR, NL and SE) banks earned nearly €0.8 billion from hedge funds in 2004. However, the share of net income derived from hedge funds was quite modest in relation to total net income and its sub-components, although proportions were higher for net trading commissions (see Chart 9).¹⁹ Across countries, net trading commissions made up the largest share of total net income derived from hedge funds (see Chart 10). Moreover, for the smaller sample of banks that also provided 2003 data the growth of total net income and its sub-components derived from hedge funds was much faster than the net income growth from all activities and hedge funds made a positive contribution to the selected banks'

¹⁹ For the selected group of eight large banks, net trading commission income accounted for 47% of net non-interest income.

Chart 9 Share of net income derived from hedge funds in 2004

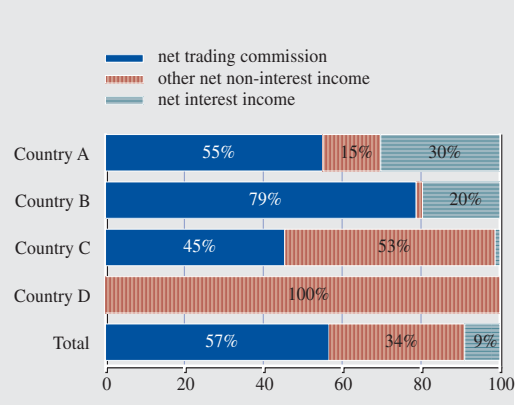
(8 large banks from 4 countries)



Source: BSC.

Chart 10 Structure of net income derived from hedge funds in 2004

(8 large banks from 4 countries)



Source: BSC.

net income in 2004 (see Chart 11). This positive contribution may further intensify banks' efforts to foster hedge fund-related services and to attract more hedge fund clients, most likely putting further pressure on applied price and non-price business terms.

Expectations regarding the future evolution of direct exposures

Many banks noted that their direct exposures to hedge funds were growing rapidly and banks anticipated further growth, although in most cases these exposures would probably remain rather limited when compared to balance sheets and total income. Banks also noted that their internal business decisions would also influence the ultimate role of hedge funds in their operations.

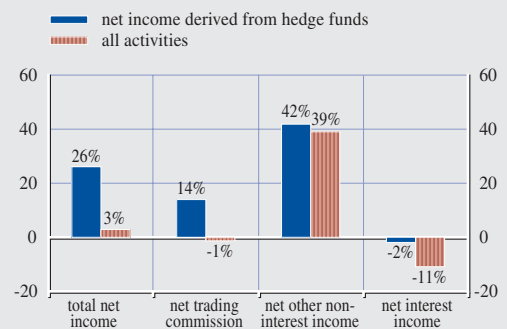
Many banks surveyed expected that financing and trading exposures would grow based on business volumes and would play an increasingly significant role in the relationship between banks and hedge funds. At the same time, several banks expressed a determined wish to preserve the policy of disallowing unsecured counterparty exposures to hedge funds. Some banks also reported an increased hedge fund demand for credit lines for unexpected short-term liquidity shortages and greater interest in longer-term (up to 6-12 months) funding via repurchase agreements as a means of

locking and managing their liquidity profiles. Together with more frequent requests for margin lock-ups and fixed haircuts, these attempts to lengthen the maturity of liabilities represent hedge fund efforts to minimise funding liquidity risks stemming from increasingly illiquid assets.

Some banks were confident that trading exposures, especially in OTC markets, would grow substantially as hedge fund demand for various plain-vanilla and sophisticated OTC contracts was increasing rapidly. One bank even stated that it expected its trading exposures to hedge funds to double over the next two years.

Chart 11 The growth of net income derived from hedge funds during 2004

(4 large banks from 3 countries)



Source: BSC.

The future of investment exposures will largely depend on the performance of existing hedge fund investments, particularly given concerns about scarcer new profit opportunities, although other factors might drive their evolution as well. Some banks thought that investment exposures would increase owing to the expected further “retailisation” of hedge funds, and that banks would become involved by adopting their own positions, managing client positions or selling hedge fund-related products. Low yields elsewhere and appealing diversification effects were mentioned as other reasons why investments should increase further. However, one bank considered that the importance of investments in hedge funds for diversification purposes would decrease, as banks would try to establish their own hedge funds or implement similar strategies within their trading activities.

Across sampled banks, income exposures did not seem to be very high in relation to total income and future growth expectations were generally moderate, even though some banks anticipated strong growth and were quite optimistic about the future prospects of revenues derived from dealings with hedge funds, mainly because of expected higher financing and trading volumes. Some other banks also expected that, over the longer term, fees and profit margins for hedge fund-related business would compress owing to strong competition and more transparency.

2.2.4 INDIRECT RISKS

Apart from direct exposures, banks face a number of indirect exposures to hedge funds. As might have been expected, according to banks, a significant indirect risk stemming from hedge fund activities was banks’ credit exposure towards financial institutions with large exposures to hedge funds. Such indirect risk might not necessarily mean the default of a financial institution, as even payment problems involving a major prime broker could have important contagious financial stability implications for the global financial system.

The second cited important indirect risk was related to hedge fund activities in financial markets in the event of a major LTCM-type hedge fund failure or unexpected international macroeconomic or credit events, leading to the forced selling by hedge funds,

the drying-up of liquidity and spillovers to other hedge funds (domino effect). In case of such market dislocations, banks were concerned about the potential impact on their trading positions or their reputation, if they were known to be heavily reliant on hedge fund business. Some banks also noted that CRT and other derivatives markets with highly concentrated activity could be particularly vulnerable to such disruptions. The “crowding” of hedge funds’ and banks’ trades or similar positioning across a number of markets was also mentioned as an important source of indirect risk.

As regards the loss of asset management income, banks did not see this as a significant indirect risk and actually regarded it as being rather low compared to other indirect risks.

2.2.5 OTHER RISKS

There are also other types of risks arising from banks’ connections with hedge funds. First, there is a legal risk regarding the enforceability of netting and collateralisation provisions contained in various agreements with hedge funds. This is particularly important given the greater use of cross-product netting for collateral and margin purposes in OTC derivatives. Second, hedge funds represent sophisticated clients which require extensive operational support and the possibility of trading in a wide array of sometimes very complex instruments, potentially challenging banks’ operational and risk management capabilities. Third, the high and increasing volume of hedge fund transactions increases operational risk related to front, middle and back office operations (e.g. calculation of risk, valuation and settlement of collateral). Fourth, some banks were concerned about reputation risk in the case of their involvement in dealings with a hedge fund facing fraud issues or publicised failure.

2.3 RISK MANAGEMENT ISSUES

2.3.1 INTERNAL RULES FOR DEALINGS WITH HEDGE FUNDS

Banks surveyed with significant exposures to hedge funds usually had specific internal rules or controls covering their dealings with hedge funds. Other banks with less strong links to hedge funds

generally relied on various risk committees and established policies to oversee their dealings with hedge funds. In some countries, parent institutions were responsible for the risk management of investments in hedge funds. In some cases, the specific policies were broader and covered either all highly leveraged institutions or all alternative investment vehicles. In those cases where specific guidelines were not in place and banks did not express an intention to develop them, supervisors might consider reviewing banks' connections with hedge funds in order to ascertain whether the scale of hedge fund-related activities warrants any specific internal rules in line with the recommendations of the Basel Committee on Banking Supervision.²⁰

Guidelines usually included a general description of (funds of) hedge funds, due diligence procedures, credit and counterparty risk policies, the risk monitoring framework and legal documentation requirements. In some cases, such documents also included broader information on the hedge fund industry and the bank's position within it or a general business strategy vis-à-vis hedge funds. Some banks also had a dedicated risk management unit within their risk management columns.

In those cases where hedge funds were primarily scrutinised by various risk management committees in the framework of general risk policies, the credit or counterparty risk management units were always involved before and after engaging in lending or trading relationships. New investments often had to be approved by senior management and/or product committees. Moreover, some banks specifically highlighted that they had caps, minimum diversification, maximum concentration requirements or maximum risk levels with respect to investments in hedge funds or other hedge fund-related activities.

2.3.2 DUE DILIGENCE, CREDIT ANALYSIS AND RATING SYSTEMS

The banks surveyed shared many general similarities in their due diligence procedures and minimum requirements for hedge funds, although

with some differences in the details and weights attached to them. Some banks with less significant exposures to hedge funds, apart from standard new client procedures, were also asking to fill in a specific hedge fund questionnaire; whereas others were applying standard procedures developed for traditional funds with some adaptations, or pointed out that they intended to set up specific due diligence guidelines for hedge funds.

At the outset of the business relationship, in credit analysis and in rating or scoring models, usually a number of factors were evaluated which may be broadly grouped in the following way:

- *general characteristics*, such as current and minimum size as measured by NAV, capital structure by types of investors, regulatory regime of a domicile, affiliation with a financial group and quality of a prime broker, administrator, auditor or custodian;
- *management quality*, which encompasses not only the track record, but also an ability to carry out administrative duties and ensure business continuity (operational capabilities, back-up systems, etc.). Some banks would decline dealing with a hedge fund if the manager had less than four years experience, or three years experience in a relevant strategy. Bank answers also seemed to indicate that a manager's experience and past performance – in absolute terms, on a risk-adjusted basis, through maximum drawdown or as proxied by the size of current NAV – had quite a heavy weight in due diligence and credit analysis processes;
- *risk profile* as described by the volatility of past performance, strategy characteristics, portfolio breakdown by geographical areas, asset types and liquidity of components, average and maximum permissible leverage, funding risk (e.g. history of investor subscriptions and redemptions) and investor exit rules (e.g. lock-up periods, redemption frequency). Co-investment of own money by a hedge fund manager was rarely mentioned in bank answers

²⁰ For further details, see Section 3.

as a factor potentially reducing the motivation for excessive risk-taking;

Nearly all banks have recently observed some lengthening of lock-up periods, particularly by high-profile start-ups with up to two or even three-year lock-up periods. Larger or successful funds were also becoming much more restrictive with respect to their redemption terms and were reducing redemption frequency and/or lengthening redemption notice periods, but often with some “gate” fees for early redemptions. These developments were facilitated by strong investor demand and, at least partly, reflected hedge funds’ efforts to account for the higher share of less liquid investments. Most banks would prefer not to be locked up for more than one year together with other redemption terms that match the underlying investments of the fund;

- *risk management* quality, i.e. risk monitoring techniques, limits and deviations from limits;
- *disclosure* in terms of frequency, detail and quality.

In addition to the elements listed above, some banks specifically mentioned that they also perform on-site visits and subsequent follow-up visits to check the operational set-up. Certain banks also highlighted that, before establishing a credit relationship, they required hedge funds to covenant not to make any borrowings in any form from any other party (“sole lender requirement”), thereby ensuring that they would remain the sole prime broker. However, such agreements seemed to be more the exception rather than a rule.

In the due diligence process, many information items were usually checked, including offering memorandum/prospectus, marketing materials, investor newsletters, audited annual and interim financial reports and available information from third-party sources, including commercial databases.

The use of some forms of rating or scoring systems in credit analysis was widespread among banks, as

82% or 18 out of 22 large banks from seven countries (AT, DE, ES, FR, NL, PT and SE) that provided such data had indicated that they used rating or scoring models for their hedge fund clients. Some of these models were quite advanced, using probability-of-default methods or other quantitative approaches, and banks expressed their intentions to ensure that these models comply with Basel II requirements. Interestingly, one of the banks has also developed a model to rate the quality of a fund manager. In addition to quantitative criteria, qualitative factors were also given a prominent role in rating methodologies and nearly always included transparency questions.

As mentioned before, the tendency to place heavy reliance on a manager’s track record raises concerns as other criteria may receive less attention than would appear appropriate. Furthermore, many banks did not mention on-site visits as being part of the due diligence process and it was not always clear how much importance they assigned to them. The value of such visits is underscored by the fact that quite often hedge funds fail due to operational issues, including the misrepresentation of fund investments, misappropriation of investor funds, unauthorised trading and inadequate resources.²¹

2.3.3 LIMITS, EXPOSURE MEASUREMENT AND COLLATERALISATION

Limits

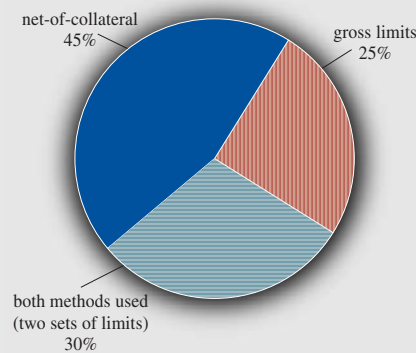
Credit limits in banks were generally based on the outcome of due diligence, credit analysis and rating or scoring models and were set in absolute amounts or in relation to the NAV or total liabilities of a fund. Once again, surveyed banks’ replies indicated that there was strong reliance on the reputation, experience and performance of a manager (especially during market stress periods), the quality of risk management, operational capabilities and disclosure. Limits also considered the maximum leverage imposed on hedge fund managers in hedge fund offering documents.

At all banks with higher hedge fund exposures, credit limits incorporated not only current credit

²¹ See, for example, Kundro, C. and S. Feffer (2004), “Valuation Issues and Operational Risk in Hedge Funds”, *Journal of Financial Transformation*, Vol. 11, Capco Institute, August, pp. 41-47.

Chart 12 Limit setting practice

(% of total; 20 large banks from 6 countries)



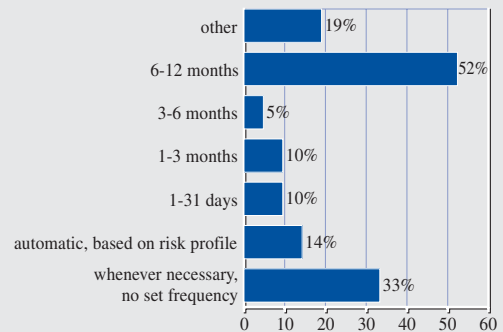
Source: BSC.

exposures (CCE) but also potential future credit exposures (PFE)^{22,23} (see Box 3), although 19% or four out of 21 large banks from seven countries (AT, DE, ES, FR, NL, PT and SE) that reported on this question indicated that they only used CCE. Most banks applied PFE limits across all products (financial instruments), or planned to do so, although some banks were still using them only for derivatives business. The survey did not cover netting practices in detail, but according to banks, they were usually netting trades by product and less frequently across product lines (cross-product netting) (provided appropriate legal agreements were in place) before applying limits on a net-of-collateral or gross (pre-collateral) basis. However, the netting of trades among subsidiaries was rare (cross-affiliate or cross-entity netting). The quantitative data provided indicated that most banks have been setting limits on a net-of-collateral basis, although the use of gross or both sets of limits was also widespread (see Chart 12). Pre-collateral limits have one advantage, namely that they are capable of accounting for the secondary market effects associated with the forced unwinding of larger trades or collateral.

As mentioned before, some banks had total caps for all hedge funds and caps per hedge fund, per hedge fund manager, per strategy for investment, financing or trading exposures in order to avoid

Chart 13 Frequency of limit reviews

(% of total banks, answers not mutually exclusive; 21 large banks from 7 countries)



Source: BSC.

concentration risk. For investment exposures, some banks also had VaR and stop-loss limits.

Based on the data provided (see Chart 13), more than half of the banks had at least annual limit reviews. However, many banks also indicated that they would review limits whenever necessary.

²² Current credit exposure (CCE) is equal to the value of credit outstanding or the replacement cost of trading positions, often after netting by and across financial instruments and net of the marked-to-market value of collateral. By contrast, potential future credit exposure (PFE) takes into account the possible variations in the value of CCE over the life of a contract. PFE can also incorporate portfolio effects as well as secondary effects associated with position replacement and collateral liquidation. Total credit exposure is generally measured as the sum of current and potential future exposure.

²³ One large bank specified that the sum of loss thresholds (usually negotiated to be zero), minimum transfer amounts and PFEs could not exceed 5% of fund's NAV.

Box 3

POTENTIAL FUTURE CREDIT EXPOSURE (PFE) MEASUREMENT

Banks' answers provided only a broad description of their PFE measurement methodologies and the review provided below should be interpreted as a brief snapshot of banks' practices. Typically, PFE was based on a marked-to-market plus a product-specific add-on approach.

In the simplest case, add-ons depended upon the underlying asset and the maturity of the contract in accordance with Basel I rules or tables of statistical estimates were used, although banks noted that more sophisticated models were in preparation.

In most other cases, various forms of the VaR approach were used, according to which PFE was usually calculated as a peak exposure over the chosen holding period with a 95%, 97.5% or 99% confidence interval. Most banks used remaining or fixed seven or ten-day horizons to calculate add-ons for the most types of trades, whereas some other banks used liquidity-adjusted VaR depending on the liquidity of collateral or by selecting an appropriate holding period, as they thought that this was more conservative than taking a standard holding period across different hedge fund strategies. For example, a one-day holding period might be used for a long/short equity fund client and ten or more days for a distressed debt hedge fund portfolio. In some cases, VaR-based add-ons were complemented with the results of stress tests, in particular when setting floor values on add-ons for short-term contracts involving credit risk or accounting for "gap" risk in CPPI (constant proportion portfolio insurance) structures.

There were also other sophisticated approaches for determining PFEs. Of those, various Monte Carlo simulations were the most popular with 95% or 99% confidence intervals and sometimes for many different time horizons within the full lifetime of a trade. In other cases, PFE for derivatives was modelled by assuming that financial variables, which underpin the values of derivatives contracts, follow a geometric Brownian motion, and by adjusting calculations, when necessary, for the forward nature of contracts or transactions with a payout structure. If the underlying variables belonged to emerging markets, FX or commodity products a jump diffusion model combined with a Brownian motion or time-dependant volatility was employed. Furthermore, sometimes methodologies were risk-specific, as banks used Monte Carlo simulations for interest rate risk, a variance-covariance approach for FX instruments and a delta-based approach with exposure boundaries for equity derivatives.

In addition to the most common confidence levels mentioned above, some banks stated that they were using state-of-the-art methodologies with an extremely high (99.99%) confidence threshold.

With respect to the advancements in PFE measurement techniques, some banks informed that in their modelling they had started accounting for the correlation between the exposure (market risk) and the default of the counterparty (credit risk) and had improved their understanding of counterparty exposure portfolio dynamics through the analysis of the sensitivity of credit valuation adjustments to the various market and credit risk parameters. Other progress was related to the ability to account for non-normal distributions, to incorporate longer time horizons or include more products in PFE models.

Based solely on the descriptions provided, without more rigorous examinations of the methodologies applied, it is not possible, if at all possible ex ante, to judge whether banks sufficiently account for the interaction of market, credit and asset illiquidity risks. In any case, banks should continue or sometimes strengthen substantially their efforts to model hedge funds' ability to meet margin calls and other liquidity demands after losses on leveraged market positions, particularly in times of stress when affected markets are less liquid and the unwinding of hedge fund positions or liquidation of posted collateral could be problematic.

Stress testing

It is well known that the usage of stress tests could significantly improve risk evaluation based solely on VaR concepts, drawdown analysis or other methodologies. Financing, trading and investment exposures to hedge funds are so complex that the value of stress tests is indispensable. They could be utilised for the calculation of PFE, limit setting, accounting for "gap" risk in CPPI structures or the estimation of collateral liquidation values and associated haircuts.

Banks with larger exposures to hedge funds performed stress tests on a regular, less frequent or on ad hoc basis. Most stress tests, particularly the regular ones, included historical scenarios. No bank indicated that it had tried to identify potential new stresses involving new correlations, which would be more relevant for rapidly evolving modern financial markets. Banks listed a number of applied historical scenarios: Black Monday in 1987, the UK's withdrawal from ERM, the near-default of LTCM, the market turbulence of 1998, the tech bubble bursting in October 2000, the terrorist attacks of 11 September 2001 and the Enron crisis in April 2002. Banks surveyed did not generally perform "major player exit" stress tests, as only one bank reported that it tests the robustness of its hedge fund portfolio by simulating a sudden exit of an important counterparty. Another bank stated that it would perform market stress tests on specific components of its overall trading portfolio, which it views as sensitive to "major player exit" scenarios. However, it will only do so on an ad hoc basis.

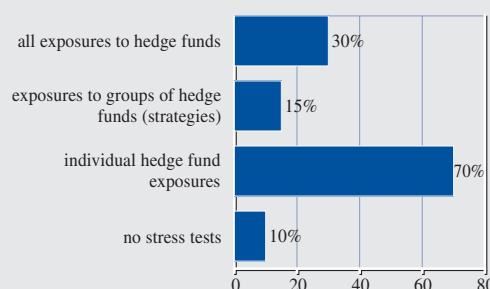
According to the data provided by 20 large banks from seven countries (AT, DE, ES, FR, NL, PT and SE), most banks were stress testing their individual exposures to hedge funds (see Chart 14), although

in the qualitative answers some banks also mentioned that they employed stress tests on a transaction basis as well. However, the fact that some banks were not using stress tests at all or that they did not stress test consolidated exposures to hedge funds is not encouraging and these banks should consider expanding the application of this risk management tool.

Some banks indicated that they used stress tests developed specifically for hedge funds, whereas other banks used the same tests as for traditional funds. One bank was more specific, explaining that it was stressing exposures to market risk factors one by one and all factors at the same time. In addition, relevant parameters also included strategies, leverage, liquidity, correlation and diversification. Another bank used stress testing to identify shortfalls in collateral, i.e. to compare the increase in exposure with the excess collateral held. As for the results of specific stress tests on hedge fund investments, one bank reported that, based on

Chart 14 Scope of stress tests

(% of total banks, answers not mutually exclusive;
20 large banks from 7 countries)



Source: BSC.

applied historical scenarios, directional strategies generally performed better in times of stress than other hedge fund strategies or more traditional asset classes.

Regarding funds of hedge funds, one bank reported that its monthly stress tests included individual hedge fund failure, combinations of hedge fund failures and failures of hedge fund strategies as defined by sharp drops in NAV. The results showed that the portfolio was well-diversified and large losses were experienced only in scenarios that corresponded to the complete failure of around 25% of hedge funds in the portfolio. Furthermore, it reported that the largest losses were not likely to arise from market risk but from illegal activities on the part of the fund of hedge funds manager. Furthermore, another bank used stress tests to determine the adequacy of collateral (i.e. underlying investments in single hedge funds) posted by a fund of hedge funds.

Collateralisation

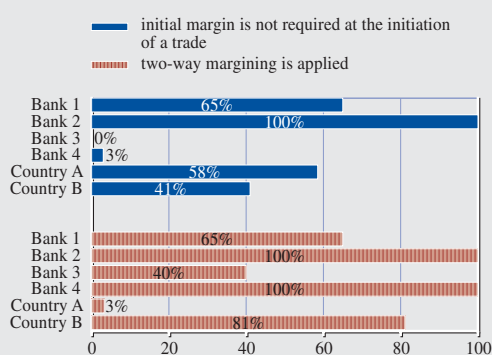
The survey revealed that banks had rather diverse practices regarding unsecured exposures, initial margins,²⁴ minimum transfer amounts²⁵ and loss thresholds.²⁶

Generally, banks had strict policies regarding unsecured exposures, as many of them had zero limits for unsecured exposures to hedge funds, never transacted with hedge funds on an unsecured basis and usually did not approve loss thresholds; there was actually little pressure for higher loss thresholds or a strong reluctance from banks to approve them at high levels. However, in some cases, there was still some leeway for unsecured exposures or, as discussed below, trading was sometimes conducted on variation margin only.

Similar to trading in a derivatives exchange, trading in OTC instruments usually requires initial margin (collateral) in the form of securities or cash. The use of cash as collateral has become widespread as according to the International Swaps and Derivatives Association (ISDA), at the beginning of 2005, cash accounted for nearly three-quarters of the collateral held to support derivatives exposures. This in turn helped to alleviate concerns

Chart 15 The use of initial margins and two-way margining

(% share of hedge funds at each bank or average share of hedge funds weighted by individual bank assets in each country; 11 large banks from 4 countries)



Source: BSC.

about the availability of high-quality collateral sufficient to meet the growing demands in these markets.²⁷ An initial margin is set at the inception of a trade and then kept unchanged during the life of the trade or recalculated on a daily basis with transfers of associated variation margin, if necessary. For transactions that fall under prime brokerage, real-time monitoring and daily margining is common practice. Some prime brokers used portfolio-based margining, as opposed to margin charges on a trade-by-trade basis. According to banks, portfolio-based margining²⁸ will probably become the market standard, even though only a quarter, or five out of the 20 large banks from seven countries that provided quantitative information on this question indicated that they used cross-margining.

As reported in Chart 15, quite a number of banks did not actually require initial margins at the inception of trades; this raises concerns because initial margins are a very important risk mitigant in dealing with hedge funds. Some banks were trading

24 Initial margin – amount of collateral, which has to be posted before transaction.

25 Minimum transfer amount – amount of collateral below which counterparty is not required to transfer collateral.

26 Loss thresholds – exposures below which no collateral is posted.

27 Greenspan, A. (2005), “Risk Transfer and Financial Stability”, May.

28 Portfolio-based margining – margin offsets based on past correlations of positions. Sometimes also referred to as cross-margining or the VaR-based margin.

with hedge funds only in liquid local plain-vanilla fixed income and FX instruments and the reliance solely on variation margin was considered relatively less risky. More precisely, some banks specified that the initial margin:

- was a function of the volatility and liquidity of the reference asset combined with the assessment of a fund's creditworthiness;
- depended on the credit score of the hedge fund client and the quality, volatility and liquidity of underlying collateral;²⁹
- was derived from standard market agreements for certain types of transactions, such as security lending; and
- depended on hedge fund's internal rating and add-on risk.

Haircuts would also provide additional collateralisation, when applied to the market value of securities that were posted as collateral (initial margin) and that were less liquid or with longer duration. One of the features of dealing with hedge funds is that both the OTC exposure and the collateral covering it can have a negative correlation; thus, robust haircuts must be applied to protect them from such scenarios. Haircuts are common in collateralised financing for the securities that are delivered as collateral.

Each day, the marked-to-market value of outstanding positions and collateral is recalculated and the variation margin is transferred, subject to minimum transfer amounts. If a two-way margining is applied, then both the bank and the hedge fund have to transfer the appropriate amount of collateral. By contrast, in a one-way margining only the hedge fund has to transfer collateral, and thus hedge funds cannot use excess collateral for other purposes until the end of a trade. Some banks reported that two-way margining had become (or was already for some time) standard in the market; whereas in other cases non-domestic funds were insisting on it or exceptions were only granted for a few very large and well-established hedge funds (see Chart 15). With regard to minimum transfer

amounts, it was detailed that they typically amounted to \$0.25 million or €0.1-0.5 million.

Most banks also indicated that by default, they only accepted liquid collateral from single hedge funds, such as cash or cash equivalents (e.g. G10 government bonds). Some banks were even stricter and accepted only cash for trading in OTC derivatives. Moreover, some replying banks were using VaR or stress tests to estimate possible variations of collateral value and to determine appropriate haircuts, but only a few of them reported the application of stress-tested collateral liquidation values.³⁰ If underlying investments in single hedge funds were used as collateral by a fund of hedge funds, then redemption characteristics of these underlying funds were also taken into account. The rather limited use of stress-tested collateral liquidation values indicates another area where banks need to expand the use of stress testing.

As an additional point, some banks noted that collateral terms would also depend on whether the same bank was a custodian of pledged collateral and whether the bank was in charge of the fund's administration.

Regarding increasing hedge fund requests for term commitments (and fixed haircuts) for margin financing, it should be noted that only a few prime brokers with high financing and trading exposures reported that they would consider such requests, which typically involve fixing margin terms for 30 or 60 (or very occasionally 120 or more) days. Other banks retained the right to change margin requirements at any point in time. As banks make credit terms stricter for hedge funds in tough times, hedge funds try to protect themselves from less favourable dealing terms at the time when such terms would be most damaging. Hence, wider

²⁹ In one case, the quality of collateral was estimated by averaging five risk components: price risk, liquidity risk, credit spread risk, issuer risk and country risk. For a fund of hedge funds, the underlying investments in single hedge funds served as collateral and "stress" rather than actual volatilities and pairwise correlations of sub-funds were used to determine margin requirements. Moreover, concentration of investments and leverage employed by underlying single hedge funds were other important model parameters.

³⁰ One bank carried out stress tests on collateral values over a 3-10 day liquidation period with a 95% confidence level.

usage of margin lock-ups or term margins, if applied prudently, could also be beneficial for financial stability, as it would lower pressures for hedge funds to liquidate investments rapidly in times of stress owing to liquidity shortages.

Counterparty discipline and demands by large hedge funds

Based on banks' comments, there was some general sense of the erosion of counterparty discipline, although some banks think that the current market standards should be quite similar – owing to the same legal documentation or similar initial margin calculation methods used – and that credit terms were only eroded slowly. Banks also reported that hedge funds were, to some extent, successful in achieving more beneficial terms by selecting the most advantageous offers from a set of banks. Some of the largest hedge fund families have been able to trade with zero initial margins on some plain-vanilla instruments. Other banks reported that they had still escaped demands to accept lower quality collateral or apply lower haircuts for sub-prime collateral. Depending on the country, different credit terms were subject to intense negotiations (see Table 4).

When asked directly, banks generally denied that they would agree on softer limits to larger hedge funds due to competition, although some recognised the impact of competitive pressures in the industry and the positive relationship between a hedge fund's business potential as proxied by its size and relatively higher limits. In some cases, credit policy documents still gave some leeway for individual negotiation, or qualitative analysis and/or decisions of senior credit committees had possibilities to overrule the outcomes of quantitative models.

Owing to their higher NAV, larger hedge funds would normally command higher absolute limits, but the relationship was not always automatic and depended on the counterparty's creditworthiness. It was also noted that sometimes larger and well-diversified (multi-strategy) hedge funds with good track records and more sophisticated risk management systems could represent lower risks than smaller funds. They also quite often required banks to provide a minimum amount of settlement limits before dealing with them. Certain banks also indicated that recently lending spreads first of all declined to larger hedge funds, as competition for

Table 4 Counterparty discipline: examples of credit terms under pressure

(grouped by country; country summaries or individual bank replies)

- Early termination provisions, as hedge funds were insisting on:
 - higher NAV decline triggers, or
 - a definition of NAV based on NAV per share rather than on total NAV.
 In addition, certain hedge funds were requesting "super collateralisation" triggers (i.e. higher margin requirements) instead of early termination, and longer tenors.
- Margin terms for credit products.
- Initial margins are the area where competitive pressures are the most extreme.
- Documentation:
 - no key man clause, even if a key manager clearly exists;
 - "super collateralisation" rather than termination upon the breach of NAV decline triggers.
- Loss thresholds.
- Two-way margining was granted to some hedge funds.
- Upward pressure on minimum transfer amounts.
- One of banks stated that some institutions seemed to have extended unsecured credit facilities to gain a presence in the market.
- Initial margins, especially for equity financing.
- No resistance to initial margins, but negotiations regarding applied percentages.
- Bond repo haircuts.
- Some of the largest hedge funds have a policy of not posting initial margin on bond repos. They also insisted on having NAV clauses that relate only to negative performance (i.e. NAV per share).
- Large US or UK-based hedge funds insisted on two-way margining, which is not common with Nordic counterparties.

the business with these entities was the most intense. Moreover, in contrast to the general policy, in some cases only large hedge funds were granted two-way margining, even though one bank still effectively avoided providing collateral in two-way margining agreements by applying hedge fund rating-based loss thresholds.

As mentioned in the previous sub-section on collateralisation, many banks had hedge fund clients that were on variation margin only, and although the size of these clients was not reported, such hedge funds were most likely the larger ones with stronger bargaining power. Overall, there were some indications that market discipline, as

applied by banks, was under pressure due to highly competitive market conditions. Even if there were proper risk controls in place, banks' risk appetite seemed to be increasing.

Leverage

Generally, there are two forms of leverage: loan and derivatives-based gearing. Sometimes these two forms are also referred to respectively as economic (debt) and financial leverage. The former is balance sheet intensive and usually provided by larger banks, whereas the latter refers to the way in which smaller banks might compete for hedge fund business with larger players and lies at the core of synthetic and derivatives prime brokerage.

Box 4

MEASURING LEVERAGE

Leverage is commonly understood to mean the ratio of total assets to equity or, in the case of a fund, to NAV.¹ The simplicity of this indicator is attractive, but such an accounting-based balance sheet measure of leverage fails to reflect the risk of the assets. Risk-based measures of leverage, such as VaR/NAV or scenario (stress test) derived VaR/NAV, alleviate this shortcoming by relating market risk to the capacity to absorb it. However, risk-based leverage measures, even adjusted for potential asset illiquidity, do not capture the funding risks arising from margin calls, redemptions or financing mismatches. The LTCM episode has clearly underscored the role of funding liquidity in escalating the effects of otherwise acceptable losses on market positions.

In the survey, most banks indicated that they usually used leverage as provided by hedge funds in order to track it on a consistent basis over time, as information necessary to develop a more complex, uniform measure for all hedge funds was not always available. Normally, hedge funds provided at least Assets/NAV ratio, although VaR/NAV was also often presented. Despite all VaR limitations, VaR/NAV is clearly a superior measure to simple Assets/NAV, but VaR is usually not available for less liquid or exotic instruments with no historical price data as, for example, is usually the case for distressed debt. To account for liquidity effects, certain banks were calculating VaR for specific holding periods. In other cases it was indicated that hedge funds largely preferred Longs/NAV indicator (sometimes longs included on-balance sheet assets and notional amounts of off-balance sheet long positions). Prime brokers, in contrast to other banks, were also monitoring VaR/(Equity in account).

One bank noted that it used different leverage ratios for different investment strategies and underlined that leverage is best accounted for in conjunction with the market, credit and

¹ There is some misunderstanding regarding the meaning of n:1 leverage, as it could mean that either total assets or liabilities are n times higher than equity, resulting in assets to equity leverage multiple of respectively n or (n+1). More often, however, n:1 corresponds to (n+1) assets to equity leverage.

liquidity risk of assets. However, reported leverage measures did not incorporate all these risk factors, as for long/short equity and event driven strategies bank draw on (Longs+Shorts)/NAV; for fixed income strategies – Assets/NAV; and for global macro – VaR/NAV. Some other banks mentioned that the way they dealt with leverage data depended on the size of credit exposures.

Another important observation is that banks generally did not have the possibility to capture off-balance sheet leverage arising from trading in derivatives, perhaps partly owing to the silo approach used by banks and the resulting separation of prime brokerage and trading activities. Another explanation, of course, is the inadequate disclosure of hedge fund positions.

Regarding the prevailing level of leverage in the hedge fund industry, the most common view among banks was that the current level is much lower than at the time of the near-failure of LTCM in September 1998 and, according to one bank, even as low as 10-25% of the 1998 level. However, it cannot be excluded that this view is based on information from market reports rather than on an own analysis.

One of the explanations for lower leverage was that hedge funds seemed to target lower but stable returns and, as hedge fund investments in less liquid assets had increased, they aimed at achieving a better asset-liability profile. Furthermore, other banks thought that this reduction could be due to the current market liquidity or the growing influence of institutional money which usually demanded more conservative strategies. The conclusion of an internal survey at one of the banks in 2004 was that the average leverage per hedge fund was rather low and that almost half of the hedge funds did not have any form of on-balance-sheet leverage.

By contrast, some banks felt that leverage had risen overall over the past 18 months. Some thought that leverage had actually increased owing to the use of new financial instruments with embedded leverage, such as total return swaps or options. One country reported that leverage multiples (ranging from 2x to 10-15x for various fixed income funds) were indeed significantly lower than in 1998, but possibly slightly higher than at the end of 2004.

Judgements regarding the funds of hedge funds were mixed. Several banks shared the view that

funds of hedge funds had reduced or were not currently increasing leverage, whereas most other banks argued that leverage had increased from previously low levels and that funds of hedge funds were more leveraged in order to compensate for lower returns of single hedge funds. This opinion of increased leverage at the fund of funds level seemed to be more prevalent.

Based on banks' answers, the tentative inference might be that single hedge funds indeed operated with lower levels of leverage, whereas funds of hedge funds tended to use leverage more aggressively. There are, however, several caveats to this conclusion. First, the absolute amount of leverage in monetary terms is probably higher now, although it might be more widely spread out. Second, as mentioned in Box 4, figures on off-balance-sheet leverage are generally unavailable. Third, a larger number of hedge funds has been chasing after the same profitable opportunities and the resulting mediocre returns may have increased incentives to employ more leverage, especially in an environment of very low interest rates. Moreover, overall leverage levels may also be affected through the more widespread use of multiple layers of gearing at the level of investors, structured products, single hedge funds or funds of hedge funds.

2.3.4 ONGOING MONITORING

Regular information provided by hedge funds

After initial due diligence and credit analysis, banks usually received regular monthly information on NAV and performance (NAV per

share), in many cases together with risk management reports. Quite often, all of this information was obtained from monthly investor letters. In some cases weekly or even daily estimates of hedge fund performance were also available and smaller hedge funds usually reported weekly, whereas the larger ones reported only monthly. Final monthly reports were usually available 15-30 days after the end of the month. The frequency of audited financial statements was usually annual, although sometimes more frequent unaudited interim accounts were also available. Many banks underlined that quarterly reporting or any other reporting less frequent than monthly, or less frequent than weekly performance estimates, was not sufficient for them, although some hedge funds still provided only quarterly reports.

Many banks would normally refuse to deal with hedge funds that did not provide aggregated risk reports with minimum predetermined disclosure requirements. The transparency and comprehensiveness of risk reports varied significantly, as some hedge funds were concerned about revealing their trading activities to banks and competitors. However, information on VaR, leverage, performance attribution, main exposures, and current strategy mix or portfolio structure by geographical area or by asset type was often included, or key and even all individual positions were provided.

Banks nearly always relied on the information provided by an external third-party administrator, a manager or an advisor, and usually did not verify the pricing of hedge fund positions themselves, bar plausibility checks or significant NAV movements. Independence from hedge funds' managers, quality and reputation and of an administrator together with the procedures for valuing illiquid trades were considered during the initial due diligence process and were reflected in the overall rating of a hedge fund. Weekly performance estimates were usually received from managers, whereas final monthly figures came largely from administrators.

In the case of funds of hedge funds, some banks also attempted to look through and monitor the

performance of underlying investments, while also underscoring the additional layer of due diligence provided by fund of hedge funds managers. The monthly information provided by funds of hedge funds was more lagged than that from single hedge funds owing to reporting lags by underlying hedge funds. In one case, it was specified that weekly return estimates for underlying single hedge funds were available after three business days, whereas confirmed monthly fund of hedge fund returns were provided five weeks after the end of the month.

Some banks seemed to be content with the information provided to them, despite reporting lags and the diversity of hedge fund disclosures in terms of scope and comprehensiveness. Banks' answers also provided an indication that there still were funds that remained relatively opaque. Moreover, in ongoing monitoring and credit analysis, there was, to some extent, trust and a reliance on the reputation and different forms of oversight conducted by prime brokers, administrators, auditors and other hedge fund-related parties.

Monitoring of exposures

Follow-up due diligence and scoring was normally conducted with similar frequency as limit reviews (see Chart 13). In some cases, however, it would probably be prudent to shorten regular review intervals to quarterly or, at least, half-year frequency. However, banks stated that they quite often phoned hedge fund managers to clarify various questions, and some banks even had agreements that hedge funds must deliver information that they, as counterparties, would be satisfied with and should answer questions whenever they might occur. According to agreements with banks, hedge funds usually had to notify banks immediately about certain important events, such as changes in management or strategy mix. Hedge funds normally supplied the information requested.

In the case of an unwillingness to provide the information requested, some banks indicated that they would usually terminate business relationships, although other banks were more

flexible and sometimes preferred instead to assign a lower rating with commensurately more conservative credit terms. The final decision depended on the overall risk profile of a hedge fund as well as on business considerations.

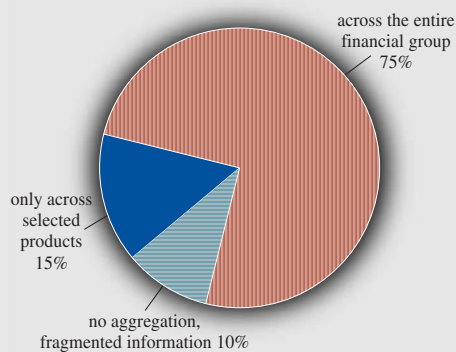
Most banks mentioned that their trading and sometimes also investment exposures to hedge funds were included in trading portfolios and were integrated into the regular monitoring and reporting framework for proprietary trading portfolio risks, covering market and counterparty risks. However, in some cases trading exposures were too small to have a more significant impact on the overall trading portfolio.

Normally hedge fund exposures were monitored by fund, fund manager and strategy, although in some cases also by leverage, performance, region, market, hedge fund size and products (financing, fund of fund financing, derivatives, prime brokerage). However, sometimes the lack of sufficient disclosure made it extremely difficult to prepare any meaningful reporting on leverage, strategies and some other indicators. Some banks with mainly investment exposures examined hedge fund portfolios to analyse how concentrations by strategy, market, asset class or currency fitted into their overall investment portfolios.

The qualitative information and survey data collection process itself have revealed that some banks with larger financing and trading exposures to hedge funds had difficulties in aggregating their exposures across the entire financial group and/or different business areas/geographical regions. One of the reasons for this was the silo-based approach utilised by banks, resulting in different concepts and risk management practices used in prime brokerage and other business areas, particularly in trading activities. Moreover, 15% of the large banks sampled that provided relevant data (see Chart 16) indicated that they consolidated hedge fund exposures only across selected products. One plausible explanation might be that the scale of exposures did not warrant a more focused approach. However, the fact that some banks (prime brokers) with larger financing and trading exposures did not properly aggregate their hedge

Chart 16 Banks' exposure aggregation practices

(% of total; 20 large banks from 6 countries)



Source: BSC.

fund exposures raises concerns. The trend to move more trading and other products onto a centralised prime brokerage platform (see Box 2), might, to some extent, alleviate these concerns in the future.

Early warning signals and termination triggers

According to banks' answers, two sets of warning signals could be distinguished. The first set relates to factors that would raise concerns, lead to contacts with hedge fund managers or a review of limits, but would not give a bank the legal rights to terminate transactions. By contrast, the second group of events, in addition to common events of default in legal agreements, could lead to the termination of hedge fund positions and the seizure of collateral held, if a bank opted to do so. Inevitably, the two sets overlap to some extent, as described below.

For the first group, all banks highlighted sudden or prolonged declines in NAV caused by either poor performance or investor redemptions, even though many other factors that were relevant for investment exposures and have already been mentioned before were also listed as a source of concern. More precisely, changes in key personnel, style drift, changes of fund rules, stressed conditions in certain markets in which a hedge fund is involved, persistent underperformance relative to peer group or relevant index, breaches of minimum NAV or established risk limits, low fund liquidity, spikes in VaR or higher volatility would

also attract attention and could lead to lower limits. If only performance data is available, then amplified performance volatility could be indicative of problems in risk control, higher VaR or even a style drift. One bank was also following strategy-specific drawdowns. It indicated that a decline in NAV of more than 20% from a peak would require explanation from hedge fund managers. One bank stated that limits could also be lowered owing to the insufficient level of business activity.

All of the abovementioned factors were usually monitored either monthly or less frequently, as provided in regular hedge fund reporting packages. Prime brokers focused mainly on VaR and daily information was available. Timely payment of margins was checked daily, too.

Regarding termination events which give banks the legal right to end a business relationship, NAV decline triggers were frequently mentioned (see Table 5), in addition to a failure to meet margin calls or departure of key principals. NAV decline triggers usually related to both negative performance and the impact of investor redemptions, thus a widespread run on hedge funds by investors would give banks the opportunity to terminate all transactions and, if exercised, could escalate financial instability, not to mention having disastrous consequences for the funds affected. However, hedge fund trading strategies are rather diverse and the likelihood of widespread sharp

declines in NAVs and associated runs in investor withdrawals is relatively low.

It was also sometimes mentioned that larger hedge funds could negotiate larger NAV decline triggers, even though size alone was not usually the primary determinant in negotiations, as smaller funds with more diversified portfolios, stronger risk management systems or good track records could be awarded higher limits as well. Moreover, one bank also reported that larger hedge funds could be allowed NAV decline triggers that relate only to negative performance, i.e. excluding the impact of redemptions.

Reporting to senior management

Based on the answers provided by banks, the frequency and content of risk reports to the senior management varied from bank to bank. Usually the senior management and various risk management committees received information on hedge fund exposures on a monthly or quarterly basis. Area (division) heads were provided with daily or weekly updates. It was also indicated that senior managers would receive ad hoc information in times of distress, related, for example, to the significant NAV or VaR movements or when hedge fund performance deviated considerably from expectations. Several banks highlighted in particular the fact that the exceeding of limits would be instantly reported to senior managers or the relevant risk management committees. At some banks there were also regular meetings with senior managers to discuss risks related to dealings with hedge funds.

Reports usually contained figures for NAV, performance and VaR. In one case it was specified that VaR was reported for each individual investment and at aggregate level in the form of non-diversified VaR. Some other banks have developed and utilised special risk (e.g. using Cornish-Fisher expansion) or performance measures (e.g. Omega, Sortino ratios) in regular reports to senior managers. For those banks with higher financing and trading exposures to hedge funds, regular reports also included various other market (e.g. expected tail loss) and credit risk (e.g. credit VaR) measures. Only one bank indicated that

Table 5 NAV decline triggers on a rolling basis¹⁾

(rows represent individual bank replies)

1 month	3 months	12 months
15%	25%	35%
10-20%	20-30%	50%
15%	25%	35%
15%	25%	35%
20-25%	25-30%	35-40% ²⁾
15%	-	45%
20% ³⁾	30% ³⁾	40% ³⁾

Source: BSC.

- 1) Normally including redemptions.
- 2) From the last fiscal year end.
- 3) All for larger funds, smaller funds might have lower triggers.

its senior management was provided with stress test results on a quarterly basis. The analysis included a comparison of the increase in exposure under stress scenarios with the excess collateral held. This finding might indicate that banks tend to place too much emphasis on VaR metrics without supplementing such information with various stress test results. Given the complex nature of hedge fund exposures, stress tests could provide very valuable information to senior management and assist in setting prudent risk tolerance levels.

Analysis of hedge fund balance sheets

Only a few of the banks surveyed with only investments in hedge funds mentioned specifically that they examined the structure of hedge funds' investment portfolios on an aggregate basis in order to spot various concentrations and to determine how the underlying hedge funds' portfolios fit into the banks' overall investment portfolio. Some banks actively monitored their investments in hedge funds and even used to ask hedge fund managers to adjust their portfolio structure if individual investments did not satisfy the needs of banks' own investment portfolios. In other cases, some banks clearly indicated that they had refrained from analysing in greater detail hedge funds' portfolios; while other banks reported that generally they relied on summary risk reports, as the usefulness of information provided by hedge funds for their risk management systems seemed to be limited or because risk analysis based on the detailed data from administrators would require dedicated staff. On the other hand, information available to sole prime brokers generally made it possible to build a rather comprehensive picture of the total portfolios of individual hedge funds. In the case of exposures to funds of hedge funds, some information on underlying single hedge funds was usually available, but banks did not go as far as to look through the portfolios of those single hedge funds.

Box 5 highlights the importance of individual and aggregate hedge funds' portfolio analysis and describes the potential transmission of stress that

could result from inadequate monitoring of hedge funds' portfolios by banks.

The possibility of initiating an aggregated monitoring of hedge funds' portfolios would probably only be relevant for a limited number of the largest global prime brokers, given the rather concentrated prime brokerage market structure, and for banks extensively trading with hedge funds in OTC derivatives markets. Thus, it would only apply to about ten large EU banks from BE, DE, ES, FR, NL, SE and UK. Market participants, including banks, already monitor developments in and the financial standing of various corporate sectors and financial institutions, therefore the deeper analysis of hedge funds' balance sheets does not look so controversial, especially as banks are in the best position to do that in order to safeguard their own commercial interests.³¹

Use of several prime brokers

In addition to not always having adequate information, the use of multiple prime brokers further complicates the ability of banks to obtain high quality information about the fund as a whole. In that respect, one prime broker reported that the average number of prime brokers of its hedge fund clients was 3.3 in 2004. Two other surveyed banks specified that only 30% and 15% of hedge fund clients used them as sole prime brokers.

According to the banks, they identified the number and identities of prime brokers, borrowing capacity as well as trading counterparties used by a hedge fund in the course of a due diligence process. Nonetheless, one bank underscored that it tended to be more difficult to obtain information on the number of regular counterparties, even though hedge funds would probably disclose how many legal trading agreements they had.

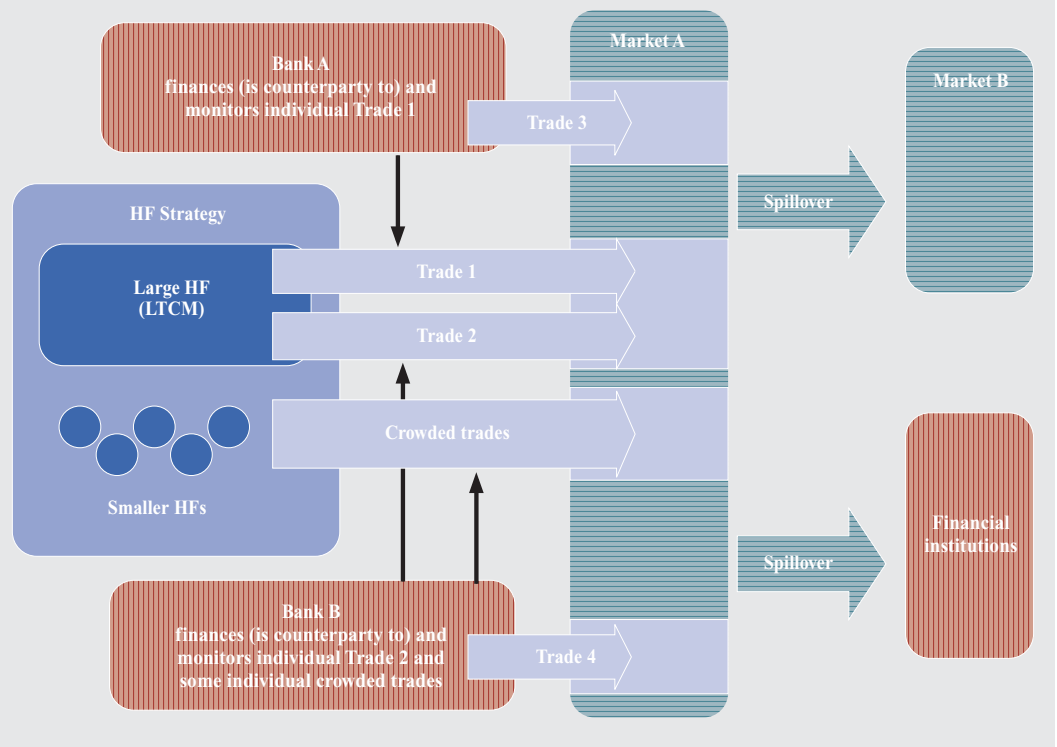
³¹ Admittedly, by trying to implement this, banks would face substantial obstacles due to the diversity of hedge fund reporting practices. This could be partly overcome if the popularity of risk management software developed by banks increased among their hedge fund clients or hedge funds (their administrators) were able to provide uniform inputs into banks' risk management systems.

Box 5

SIMPLIFIED HYPOTHETICAL CRISIS SCENARIO

In the left panel of the diagram below, there are one large and a number of small hedge funds following similar investment strategies. The large fund has two similar individual positions (trades 1 and 2) in market A. Two banks (banks A and B) finance or are counterparties to these two medium-sized trades 1 and 2. Both banks monitor their trades individually without paying attention to or not having enough information about the structure of the total hedge fund's portfolio, and to each of them trades look manageable and liquid in isolation. Moreover, banks A and B also take proprietary trading positions in market A (trades 3 and 4). Outstanding trades 1 to 4 together constitute a significant share of market A, leading to high market concentration and increased vulnerability to the sudden withdrawal or insolvency of a major player.

As such, the constellation described above is not unlike that preceding the near-collapse of LTCM. Since 1998, however, the hedge fund industry has grown to more than \$1 trillion in assets under management with a large number of smaller players entering the market. The decreasing concentration of the hedge fund industry could be seen as beneficial from a financial stability perspective. However, there are some indications that in the context of the global search for yield a larger number of hedge funds could be pursuing similar strategies, thereby leading to the "crowding" of trades. If the concentration of trades is not detected by banks, in the case of market turmoil and mass unwinding of positions, crowded trades may have a similar impact as the exit of a large hedge fund.



Most banks noticed a tendency among hedge funds, particularly larger ones, to use several prime brokers, each with specific product or geographical expertise, in order to diversify their counterparty base and ensure pricing efficiency. Many of them were employed for particular strategies although in some cases, more than one prime broker was used for the same strategy. One bank noted that macro and fixed income arbitrage funds used one or very few prime brokers for their clearing and settlement but had always used multiple trading counterparties. Several other banks also mentioned that long/short equity funds tended to use several prime brokers in order to secure stock or bond borrowings for short selling.

Banks also pointed out that this tendency could have an adverse effect on risk management owing to a lack of transparency and increased competition among banks, thus putting pressure on them to offer more favourable pricing and margin requirements. On the other hand, one bank also stressed that it would draw comfort from the fact that a particular fund was not dependent on one sole source of liquidity/leverage, which could adversely affect the fund in times of distress.

However, under portfolio-based margining the use of several prime brokers is not practical for smaller hedge funds, as working with only one prime broker provides substantial margin savings. Moreover, in these cases banks, as sole prime brokers, benefit from a high degree of transparency in a fund's positions. Thus the increasing popularity of portfolio margin requirements will act against the trend of using more prime brokers.

2.3.5 RISKS OF FUNDS OF HEDGE FUNDS

For some banks with mainly investment exposures, investments in funds of hedge funds (FOHFs) were the main type of investments in hedge funds, whereas other banks stated that they were interested only in single hedge funds. Quite often investments in FOHFs were related to sold structured products or used as hedges for derivatives.

Generally, FOHFs were deemed less risky than single hedge funds. All banks surveyed mentioned

higher diversification and associated lower volatility of returns as key advantages of FOHFs compared to single hedge funds. Some banks noted that relative safety was further enhanced by their practices of looking into the characteristics of underlying single hedge funds. Furthermore, FOHFs managers were usually expected to monitor underlying single hedge funds more actively and have deeper market knowledge together with wider contacts. Quite often, FOHFs also offered better redemption terms, thereby taking more of the liquidity management burden from end-investors upon themselves. FOHFs may have more restrictions on leverage, short-selling and other risk-taking activities, particularly if registered in countries where their activities are regulated. Moreover, FOHFs were often used in structures with capital protection, therefore posing lower reputation risks for banks arising from possible investor complaints.

However, some banks also highlighted that in some cases FOHFs could pose higher risks, as correlations among underlying funds and strategies increase in times of stress. One bank noted that diversification benefits were usually overstated due to style drift. Moreover, the increasing crowding of trades may further lower diversification among underlying funds following similar strategies. Other banks were also worried about the increasing use and greater availability of leverage for FOHFs, particularly if based on the perception that these vehicles were safer than single hedge funds. The second layer of leverage or leverage on leverage could increase risks significantly, especially if coupled with the mismanagement of funding liquidity. Indeed, the latest tendency of longer lock-ups at the single hedge fund level may pose higher funding liquidity risks for FOHFs, as they usually offer more frequent redemption possibilities than underlying single hedge funds. In addition, FOHFs are riskier for lenders as they pledge shares of underlying investments in single hedge funds, which carry a subordinated credit status. Finally, banks that invest or lend to FOHFs do not have direct (micro) control of underlying investments in single hedge funds.

According to banks, they tried to mitigate these risks by careful due diligence and ongoing monitoring. Many banks required full transparency of FOHF portfolios, including information on liquidity, leverage and other risk parameters. Banks generally had extensive diversification requirements for FOHFs in terms of minimum/maximum allocations to underlying individual single hedge funds, managers and strategies. They were also investigating track record (performance and experience), reputation, size, investment philosophy, risk management systems, investment and monitoring processes and minimum requirements for targeted single hedge funds. Similar due diligence and ongoing monitoring was applied to sub-funds of multi-strategy hedge funds as well, because diversification and cross-contamination issues are more important for such funds.

2.3.6 OTHER FINDINGS

Based on the experience of the banks surveyed, hedge funds' responses to losses varied from fund to fund, although on balance it seemed as if hedge funds were becoming more cautious, i.e. reducing exposures or applying different strategies after periods of underperformance. The increase in risk-taking was largely seen as a function of the opportunity set available. However, in mid-2004 some banks witnessed a higher use of leverage, albeit from relatively low levels, by their hedge fund clients employing fixed income strategies in response to the difficult trading conditions seen earlier in the year. One bank also mentioned that many institutional investors, including itself, were looking for hedge fund managers who reduce rather than increase risk-taking in times of stress or underperformance.

Regarding the implications of the forthcoming Basel II requirements, banks that provided answers on this question did not generally think that the new capital adequacy rules would have a material impact on the risk management of exposures to hedge funds, as exposures were collateralised and would be treated as corporate risk. However, one bank complained that the consultative paper on the trading book review had not yet fully recognised cross-product netting according to the ISDA

Master Agreement and therefore could pose a business constraint. Another bank expected that if it were allowed to use the Internal Ratings Based (IRB) Advanced Approach, it would be able to assign a high recovery rate to exposures secured by hedge fund collateral. In this way, Basel II could reduce regulatory capital requirements. A third bank argued that VaR was not necessarily an appropriate measure for the market risk posed by hedge funds, due to illiquidity, fat tails and relative non-transparency. A fourth bank reported that there was no clear treatment of hedge funds in Basel II documentation, particularly regarding the boundaries between banking and trading books. A fifth bank anticipated that banks would break down hedge fund exposures to primary risk factors, although it thought that such efforts would not be very successful on a cost-benefit basis and because hedge funds are dynamically managed. Moreover, the largest hedge funds would probably be unwilling to offer full transparency of their portfolios to entities that could potentially take advantage of this information.

3 SOME SUPERVISORY ISSUES ARISING FROM HEDGE FUND ACTIVITY

This section reviews a number of supervisory issues related to the findings of the BSC survey. Hence, it focuses on sound risk management practices and capital requirements for banks' interaction with hedge funds as well as on supervisory actions to this end, rather than on the issue of a possible direct regulation of hedge funds. Sound risk management and capital requirements contribute to the wider policy aim of safeguarding financial stability, which is also at the core of the debate regarding the possible regulation of hedge funds. Indeed, by managing their risks prudently, banks can limit their potential losses from troubled hedge funds. Banks acting prudently as counterparties of hedge funds can also exert market discipline, thereby influencing the risk taking of hedge funds. In line with the approach taken in the survey, the supervisory implications are investigated for the main direct links that exist between banks and hedge funds, i.e. banks as counterparties to hedge funds, and banks as investors in hedge funds.

3.1 BANKS AS COUNTERPARTIES OF HEDGE FUNDS

3.1.1 RISK MANAGEMENT PRACTICES

Immediately after the near-default of LTCM in 1998 and the market turbulence surrounding this event, a number of international initiatives were launched to address potential systemic risk concerns arising from the activity of hedge funds. Starting in 1999, the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO) published a number of papers on banks' interactions with "highly leveraged institutions" (HLIs), foremost hedge funds. Furthermore, the Joint Forum, IOSCO and the Financial Stability Forum undertook a detailed analysis of the policy lessons learnt from the LTCM episode.

The BCBS document of 1999 on the sound practices for banks' interactions with HLIs³² still constitutes a sound basis for the supervisory review of banks' counterparty exposures to hedge funds. This document addresses some of the major risk management failures that became apparent in the LTCM episode, i.e. an over-reliance on the collateralisation of marked-to-market exposures and the insufficient weight placed on the in-depth credit analyses of HLIs. Thereafter, the BCBS

focused on monitoring the implementation of its recommendations and published in 2000 in this respect a review.³³ This review outlined a series of issues relating to HLIs which required further attention from banks, supervisors and international fora. It also proposed continued collaboration between bank and security firm supervisors and an ongoing dialogue with the financial industry, particularly in challenging technical areas, such as the measurement of potential future credit exposure and stress testing. This led in 2001 to a joint review by the BCBS and IOSCO of issues related to HLIs (see Box 6).³⁴ These various initiatives targeting specifically the interaction between regulated firms and hedge funds should be seen in conjunction with the more general guidance developed by the BCBS in the different areas of banks' risk management, in particular concerning credit risk.³⁵

32 Basel Committee on Banking Supervision (1999), "Sound Practices for Banks' Interactions with Highly Leveraged Institutions", January.

33 Basel Committee on Banking Supervision (2000), "Banks' Interactions with Highly Leveraged Institutions: Implementation of the Basel Committee's Sound Practices Paper", January.

34 Basel Committee on Banking Supervision and the International Organization of Securities Commissions (2001), "Review of issues relating to Highly Leveraged Institutions (HLIs)", March.

35 Basel Committee on Banking Supervision (2000), "Principles of the Management of Credit Risk", September.

Box 6

THE JOINT REVIEW OF ISSUES RELATED TO HLIs BY THE BCBS AND IOSCO

Overall, the joint BCBS-IOSCO report of 2001 was encouraged by firms' continued progress in implementing the recommendations in the BCBS "sound practices" document. As achievements, the report particularly mentions strengthened senior management oversight, clearer definitions of overall risk appetites, improved internal reporting and efforts to improve information flows from hedge funds and progress in the credit due diligence process.

However, a number of areas where additional progress was needed were also identified, foremost the need to enhance exposure measurement methodologies. In this regard, progress in conducting regular and comprehensive stress testing was considered rather slow. Furthermore competitive pressures were noted to affect firms' ability to insist on the full range of risk mitigants, including initial margin. The report called for individual firms to have adequate "packages" of mitigants and risk management techniques for their risk exposures. It also argued that supervisors should remain alert to the risks attaching to HLI counterparties and to exercise judgement about the way in which the elements of the package are combined.

The survey conducted by the BSC revealed that some of the areas identified by the BCBS and IOSCO five years ago as offering scope for further improvement are still relevant. These areas include the timeliness and comprehensiveness of the information provided by hedge funds to their bank counterparts, the aggregation of exposures on hedge funds across the whole (banking) group, the impact of competition on the use of risk mitigants (in particular initial margins) and the application of stress-testing (also in relation to the collateral taken).

Given the weight of these concerns, the financial industry also took several initiatives to address the concerns of authorities. The most prominent ones include the recommendations of the Counterparty Risk Management Policy Group (CRMPG), a group of senior officials from major, internationally active banks and securities firms. In 1999 the CRMPG published a set of recommendations that aimed at improving practices regarding counterparty risk management³⁶, and which included areas such as information-sharing between counterparties, disclosure practices and industry documentation, risk assessments and stress-testing.

In 2005 the CRMPG released a follow-up report to analyse the implementation of the recommendations in the 1999 report, to study the impact of new developments such as CRT instruments on risk management practices and to provide a conceptual analysis of some “emerging issues”.³⁷ The CRMPG II goes beyond credit and market risk, dealing now also with operational and reputational risk. Though many of its recommendations would further enhance or refine initiatives already underway, the CRMPG II takes the view that even where this is the case, the enhancements and refinements are substantive and material. Furthermore, its recommendations and guiding principles should be seen as forward-looking and as an integrated framework of initiatives. Most of the action points of the CRMPG II relate to measures that are within the control and reach of individual institutions. Others, by contrast, entail collective actions by institutions or their representative bodies.

Supervisors as well as market participants should remain vigilant to new developments in the hedge fund industry which may confront them with

situations requiring risk management practices going beyond the abovementioned internationally agreed standards. One such area is, for example, the development of the CRT markets. These markets allow the transfer of credit risk from banks to other market participants such as institutional investors, non-financial firms and, increasingly, also hedge funds.³⁸ Although the BSC survey indicated that in general hedge funds were not key counterparties to banks in CRT instruments, hedge funds have become important players in these markets and their importance is generally expected to increase further.

In view of this development there are a number of specific risk management concerns to be kept in mind. Banks purchasing credit protection need to be aware not only of the residual risks that can result from the contractual terms and enforceability of CRT instruments but also of the risks posed by counterparties providing credit protection, such as hedge funds. In that respect, it should be noted that there is a different treatment of credit protection purchased by banks, depending on whether the instrument is allocated to the banking book or the trading book.³⁹ As this can result in markedly

36 Counterparty Risk Management Policy Group (1999), “Improving Counterparty Risk Management Practices”, June.

37 Counterparty Risk Management Policy Group (2005), “Toward Greater Financial Stability: A Private Sector Perspective”, July.

38 See, for example, Fitch (2005), “Hedge Funds: An Emerging Force in the Global Credit Markets”, July.

39 In the banking book, only protection from providers that have a lower risk weight than the original borrower reduces the capital requirement. This is, for example, the case if a 100% risk-weighted exposure is protected by a 20% risk-weighted bank (in contrast to a hedge fund as a potential counterparty), a low default risk, broadly diversified protection provider. If a credit risk position in the trading book is hedged by a credit derivative, the reduction of specific risk charges would be independent of the protection provider’s credit quality. The latter would be accounted for by a separate counterparty credit risk capital requirement.

different capital charges, supervisors should monitor prevailing bank practices, though financial innovations make it increasingly difficult to make a clear-cut distinction between the two types of portfolios. Other concerns related to CRT markets and hedge funds' growing presence are the relatively small set of market participants that are fully active (hence the need to monitor credit risk concentration), the performance of CRT markets under stress conditions (hence the need for adequate stress-testing) and the long settlement lags (hence the need to further improve operational efficiency in the back-office functions).

3.1.2 CAPITAL REQUIREMENTS

As regards minimum capital requirements, there is foremost the issue of the appropriate risk weight for credit exposures to hedge funds. Compared to a "plain-vanilla" corporate borrower, most hedge funds at least aim to run low exposures to systematic, non-diversifiable risk, which, taken in isolation, might justify sub-average capital requirements. However, a different issue is whether this investment objective is effectively achieved as some hedge funds seem to engage in "long only" strategies similar to traditional investment funds. Moreover, the low correlation to general market risk may not hold under stress conditions. Other financial characteristics of hedge funds, such as their potentially high leverage and relative opacity, by contrast, would argue for increased risk weights. The 100% risk weight for unrated corporates under both the current framework and forthcoming Basel II Standardised Approach⁴⁰ obviously does not really reflect this consideration.

However, devising more adequate reflections of hedge funds' default risk under the Internal Ratings Based (IRB) Approach⁴¹ of Basel II is also a considerable challenge. As large and complex financial institutions (LCFIs) will most likely apply the IRB Approach, supervisors may need to pay particular attention to the modelling of the required risk parameters of hedge fund exposures. The rating criteria for corporates or financial institutions will therefore need to be adapted to the specificities of hedge funds counterparties. The lack of sufficient information and adequate

transparency are in that respect particularly challenging. It should be noted that transparency and leverage are already important elements to be considered by banks in their rating process. Furthermore, the complex risk structure of hedge funds' assets may not be particularly suitable for rating models, which have typically been developed to estimate the credit risk of "plain-vanilla" corporate or interbank exposures. The academic literature on this topic has not yet produced satisfactory answers and public information about practitioners' approaches is so far unavailable. For smaller banks that apply less sophisticated approaches to manage credit and market risk, the challenges relating to the monitoring and managing of hedge fund exposures may even be more intense.

The BSC survey showed that banks, at least for their financing exposures, require high degrees of collateralisation from their hedge fund counterparties, which takes the form of financial collateral. Where this collateral is not of the highest quality, there may be a high correlation between the collateral value and the default risk of the borrower. This implies that there is only limited additional protection from the collateral in situations of stress. Consequently, where collateral of lesser quality is used, and which under Basel II's more sophisticated approaches is now also recognised for regulatory capital purposes, the degree of over-collateralisation may need to reflect potential stress scenarios. In that respect, it should be recalled that the BSC survey found only a limited use of stress tests to determine the liquidation value of collateral.

Where netting agreements are used as credit risk mitigation, the interaction of market risk and credit risk also deserves consideration. This is particularly true if previously thin or non-existent markets receive liquidity from new hedge funds' activity. In such a scenario, the bank may be able to

⁴⁰ Under the Standardised Approach, the bank can use external ratings (if available) provided by rating agencies to calculate its regulatory capital requirements for credit risk.

⁴¹ Under the Internal Ratings Based Approach, a bank can use its own credit assessments to calculate its regulatory capital requirements for credit risk. Depending on the risk factors the bank is allowed to estimate itself, a distinction is made between a Foundation IRB and an Advanced IRB.

close out its OTC transactions with the defaulted counterparty effectively, but it could be left with open unhedged market risk positions it had considered as hedged by the OTC derivatives before. This may pose problems for the bank's risk management if these positions are illiquid and difficult to re-hedge because there is only a limited number of counterparties in the market.

Finally, under the supervisory review process ("Pillar II") of Basel II the management of the bank has to make sure that the institution has adequate capital available to support its risks, and supervisors should take appropriate action when this is not the case. Such action could include, for example, requiring the bank to strengthen its risk management, improve internal controls, increase provisions and, ultimately, even increase capital. The supervisory review process therefore provides a useful framework to ensure that the bank adequately addresses the risks resulting from its interactions with hedge funds. For smaller banks with hedge fund exposures, though, the challenge for supervisors is to have sufficient resources available to cover also them adequately under the Pillar II review on a regular basis.

3.2 BANKS AS INVESTORS IN HEDGE FUNDS

3.2.1 RISK MANAGEMENT PRACTICES

The BSC survey highlighted that in many EU countries, investments of banks in hedge funds are the major, and sometimes the only, direct link between the two types of institutions. The banks in the survey identified a range of operational risks that could potentially affect their investments. Such risks can be mitigated through a careful due diligence process. Adequate internal processes should therefore be in place, first, for scrutinising new investment instruments and reporting the results to senior management before risks are incurred; and second, to manage the incurred risks on an ongoing basis. Less sophisticated institutions in particular should not make significant investments in hedge funds without fully understanding the risk they entail. These internal processes should be regularly reviewed by external auditors as well as supervisors.

3.2.2 CAPITAL REQUIREMENTS

Under the current capital requirements rules, investments in hedge funds are treated as plain equity and consequently risk weighted at 100%. Given the above considerations of the risk weights for credit exposures and given equity's even higher risk, this risk weight is probably too low for most of the hedge funds and may need to be adjusted upward in certain cases. The Standardised Approach of Basel II gives in that respect supervisors the option of assigning a 150% risk weight to certain high risk asset categories which may constitute a somewhat more adequate treatment.

Under Basel II's IRB Approach, the bank has two possibilities: either it applies fixed and rather high-risk weights of 400%⁴² to equity investments; or instead, it will use its own estimates for risk weights that apply to equity positions. The own estimates can be based either on a VaR methodology or on the probability of default the bank assigns to the hedge funds and the loss given default associated with its equity (the "PD/LGD method").⁴³

The VaR methodology for equity exposures will be inadequate for most hedge funds because the historic returns it relies upon would need to be derived from the NAV calculations of the funds. These will often constitute a bad proxy for future volatility of hedge funds' returns, in particular if event or credit risk plays an important role. Further challenges to this modelling approach are skewed returns distributions and data availability. Thus it may be expected that supervisors will in most cases not authorise the use of VaR approaches. The PD/LGD method, on the other hand, faces the same problems that the IRB modelling of credit exposures to hedge funds entails. Furthermore, only for LCFIs with a large number of hedge funds exposures, the authorisation of the PD/LGD method should be considered. Hence, it is likely that all other IRB banks will need to take recourse to the fixed risk weights.

⁴² For publicly traded equity, this is reduced to 300%.

⁴³ The probability of default is the likelihood that a borrower will default within a certain time period (generally one year). The loss given default is the loss, measured as a percentage of the exposure at default, which is likely to occur in the case a borrower defaults.

4 CONCLUSIONS

Hedge funds are playing an increasingly important role in the financial landscape and therefore continue to attract the attention of both authorities and the financial community. Various efforts are underway to gain a better understanding of the development of the hedge fund industry and what it implies for the financial system at large, and the BSC study aims at providing a contribution to this. However, because of the survey's limitations and the work underway by various international and European fora in this area, the conclusions presented in this report can only be considered as preliminary and indicative of prevailing exposures and risk management practices. Nevertheless, a number of findings are worth highlighting.

The survey demonstrated that large EU banks' exposures to hedge funds varied across countries. Direct exposures seemed to be growing rapidly, although generally they were not large in relation to banks' balance sheets and total revenue or similar exposures undertaken by US peers. In most EU countries, exposures took the form of direct investments in hedge funds although more or less sizeable financing and trading exposures were observed in DE, ES, FR, NL, SE and UK. It is not possible to provide a firmer conclusion about the size of EU banks' direct exposures owing to the fact that only a limited number of large EU banks provided comparable quantitative data. However, it is very likely that the absolute and relative size of exposures to hedge funds will increase further in line with the continuing expansion of the hedge fund industry, and in particular its European segment.

Most banks extensively dealing with hedge funds had specific guidelines for this interaction and advanced risk management systems or were in the process of improving them further. The survey provided some evidence that generally large EU banks surveyed had stringent requirements for exposures to hedge funds with a strong emphasis on collateralisation, although there was also evidence that banks quite often traded with hedge funds on variation margin only.

The survey also highlighted some key areas for further improvement of banks' risk management. These shortcomings carry the risk of turning into a cause of concern, particularly if the current rather benign market conditions would change abruptly. They are:

- *Counterparty discipline.* The survey provided some evidence that market discipline, as applied by banks, shows signs of weakening owing to highly competitive market conditions. In particular, several banks reported that hedge funds were, to some extent, successful in achieving more beneficial business terms. Indeed, the largest hedge funds seemed to have enough financial clout to negotiate some concessions, including less rigorous collateral terms, lower lending spreads or higher NAV decline triggers.
- *Stress testing.* Most of the banks' stress tests, particularly the regular ones, included only historical scenarios. Moreover, banks were normally only stress testing individual exposures to hedge funds rather than trying to estimate aggregate effects on all exposures or effects on separate hedge fund strategies. Also the stress-testing of collateral was less common and offers scope for further improvement.
- *Aggregation of banks' exposures to hedge funds.* Some larger banks reported having difficulties in aggregating hedge fund exposures across the entire financial group and/or different business areas/geographical regions. That applies in particular to banks' internal risk management practices that were often different in prime brokerage divisions from other business areas of the bank.
- *Hedge fund disclosures and information on leverage.* Despite some progress, the survey revealed certain shortcomings regarding the quantity, quality and timeliness of data provided by hedge funds to banks. For example, banks typically had only lagged monthly information on several key variables such as NAV, NAV per share and hedge fund risk profile. It seems that in many cases hedge funds still provided banks

with relatively crude measures of leverage, although an increasing number of hedge funds were supplying more advanced risk-based measures of leverage such as VaR/NAV. Moreover, banks generally did not have information on off-balance sheet leverage arising from trading in derivatives.

- *Analysis of hedge funds' financial positions.* Banks' descriptions of their risk management practices also raised questions about whether banks were sufficiently taking into account and/or had enough timely information on the whole portfolio structure of hedge funds, particularly of the larger ones with financing and trading relationships with several counterparties. Despite the diversity of hedge fund disclosures, banks could also consider implementing the aggregate analysis of hedge funds' financial positions by adapting their systems to harness detailed position data received from hedge funds or their administrators. If implemented, such analysis could also allow spotting crowded trades among hedge fund clients.

All in all, hedge funds are a moving target for banks' risk managers, as risks posed by hedge funds are changing with the evolution of financial markets and the expansion of the hedge fund industry. Hence, it is rather difficult to judge, if at all possible *ex ante*, whether current risk management practices are adequate.

The main policy conclusions that can be drawn from the survey can be summarised as follows. First, on the question of whether recent developments in the hedge fund industry pose a direct threat to financial stability in the EU through the banking channel, the evidence collected through the BSC survey indicates that this may not be necessarily the case. This is mainly due to the fact that the prime brokerage market is dominated by US banks so that the direct exposures of EU banks are generally limited in absolute and relative terms. However, as indicated above, there are some areas of concern affecting EU banks' exposures to hedge funds that warrant further monitoring.

Furthermore, in some respects direct exposures may underestimate the true risks stemming from hedge funds. Given their very large trading volume activities, there may be significant risks related to adverse developments affecting institutions with potentially high leverage. These risks could be exacerbated when the positioning of individual hedge funds becomes more similar or "crowded". Consequently, adverse market dynamics could have significant spillover effects on banks, which are not evident from direct exposures. For banks selling hedge funds or hedge fund-related products to their clients, reputation risk may be another potential source of indirect risk.

Second, the main recommendation put forward by public authorities in the aftermath of the LTCM case – according to which adequate management by banks of risks associated with hedge funds should be put in place – still remains relevant for large EU banks surveyed, as some specific areas of risk management seem to require further improvements, even though this is a matter for supervisors to judge.

In particular, where individual banks' links with hedge funds are material, supervisors should become aware of the need to review whether banks' risk management practices for the related risks are sound. More generally, the survey showed the difficulties for banks of estimating hedge fund risks in a comprehensive and exhaustive manner. The still limited transparency of hedge funds – taken together with the complex interactions of the different sources of risk – always makes addressing hedge fund risks by banks somewhat incomplete. As a minimum, however, banks should be able to aggregate their overall exposure to individual hedge funds across books and risk buckets and limit it to a prudent percentage of their own funds. Where doubts remain over the diversification of risks underlying the exposures to all hedge funds taken together and the interaction among the various risks concerned, the overall exposure to hedge funds in general should also be limited prudently.

Third, risk management guidance developed by supervisors and the capital adequacy regime

constitute the appropriate framework for authorities to deal with risks resulting from banks' interactions with hedge funds. In particular the supervisory review process provided for under Basel II allows supervisors to take any additional measures, specifically with regard to capital adequacy, needed to address such risks. Regarding the supervisory issues arising from hedge fund activity, it is also worth recalling that at the European level the convergence of supervisory review practices in general is an important strand of work of the Committee of European Banking Supervisors (CEBS).

ANNEX I HEDGE FUND DEFINITIONS, AS PROVIDED BY BANKS OR SUMMARISED BY COUNTRY AUTHORITIES

Country summaries

Common elements of banks' definitions of hedge funds are as follows:

- unregulated form of investment partnership;
- situated in offshore centres;
- use a large spectrum of different instruments – including leverage and short-selling;
- intended for institutional investors and high-net-worth investors;
- no or at least lower regulatory requirements;
- absolute return strategies;
- performance-based fee structure.

Banks define hedge funds as an unregulated form of investment partnership that uses leverage, derivative instruments, short-selling, arbitrage and other high-risk strategies to achieve targeted levels of risk and return. Hedge funds have to fulfil only weak disclosure and regulatory requirements, especially regarding capital requirements. Most hedge funds are located in offshore centres. In comparison with standard investment funds, they have longer contractual liquidation, redemption or withdrawal periods of associated certificates/shares. In order to gain high returns, they trade large volumes with a high leverage factor and their investments are sometimes concentrated in speculative, illiquid or narrow markets/products, e.g. emerging markets, distressed securities or convertible arbitrage. Especially funds with arbitrage or one-directional strategies have a large refinance/repo ratio.

Most banks use some internal definition of a (fund of) hedge fund, formulated in their internal policy documents. These definitions are, in general, closely related to the working definition used in the survey, containing elements such as "loosely regulated, few restrictions with regard to the products in which they can invest, the trading strategies they can pursue or special investment techniques (e.g. short-selling, leverage) they can apply, absolute return driven, managers receive performance-related fees", etc.

Hedge funds were defined as funds which generally manage third-party funds and which have the ability to leverage their resources. In addition, they target absolute returns (non-correlated to markets) and use a diversified array of instruments to achieve these results.

Most definitions included criteria such as: lightly regulated entities; the use of leverage; the ability to take short positions; investment strategies aimed at maximising returns through the use of a range of financial instruments; investors deemed to be sophisticated.

Individual bank replies

Hedge funds are defined as those investment vehicles that use gearing.

One of the main characteristics of hedge funds is that they are scarcely-regulated and absolute return oriented leveraged funds with limited liquidity.

An asset class with the following characteristics: it is usually domiciled offshore, returns are uncorrelated with major indices (absolute returns), it makes intensive use of financial derivatives in order to maximise their performance and charges high fees (up to 20% performance fee).

Typical characteristics: limited or no regulation, limited disclosure requirements and the resulting lack of transparency, significant management and performance fees, frequently changing investment portfolios, infrequent investor redemptions.

Several criteria are used:

- absence or quasi-absence of specific rules defined by the regulatory authorities under whom the fund operates (e.g. lack of limitations related to leverage, short-selling and diversification);
- specific investment objectives (emphasis on absolute returns rather than on relative returns);
- use of very wide range of investment techniques – including leverage, short-selling and other hedging strategies in an attempt to achieve absolute returns).

Hedge funds are defined as unregulated or lightly regulated investment pools, set up for qualified investors seeking high return and/or little correlation to financial markets evolution. Notable characteristics of hedge funds include:

- privately organised investment vehicle domiciled outside G10 countries;
- access limited to qualified investors only;
- subject to very little or no direct regulatory oversight;
- lack of transparency and of daily prices;
- use of balance sheet leverage (cash borrowing to NAV > 50% or repo/stock lending to NAV > 100%) and/or short securities (net short position above 20% of NAV);
- performance-based fees;
- restrictive redemption policies, which are also subject to change.

Hedge funds are a subcategory of unregulated funds, which are investment vehicles that are not formally regulated by a government-approved regulator accepted by our institution.

Investment vehicles that try to achieve above market returns using leverage. Their strategies might involve both long and short positions and the universe of their investments can be quite broad. They can be either asset class specific, i.e. fixed income, FX, equity, etc. or region/country specific.

Funds whose managers have very limited restrictions on the use of leverage, short positions, derivatives and other strategies in order to achieve positive absolute returns while preserving capital.

Funds that trade and invest mainly in “fixed income”, including the use of OTC derivatives, but with the possibility to deal in other markets like commodity, currency and equity. The use of derivatives allows fund manager to create significant leverage, so that traded assets can be higher than assets under management. For this reason, hedge funds have highly speculative activities in OTC markets.

An investment fund that uses alternative investment strategies i.e. is not a conventional mutual fund.

Other funds than mutual funds, insurance funds or pension funds are to be regarded as hedge funds according to internal instructions.

Hedge funds are investment partnerships that seek above-average returns through superior portfolio management and whose primary compensation is percentage of profits.

All funds not equivalent to mutual funds are defined as hedge funds.

Hedge funds apply market neutral strategies to achieve performance; this means that the performance is independent from the performance of equity or bond markets. Fund of funds invests with multiple managers through funds or managed accounts. The strategy designs a diversified portfolio of managers with the objective of significantly lowering the risk (volatility) of investing with an individual manager. A fund of funds manager has discretion in choosing which strategies to invest in for the portfolio. A manager may allocate funds to numerous managers within a single strategy, or with numerous managers in multiple strategies. The minimum investment in a fund of funds may be lower than an investment in an individual hedge fund or managed account. The investor has the advantage of diversification among managers and styles with significantly less capital than investing with separate managers.

Note: Country summaries and individual bank replies do not overlap and always refer to different banks.

