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Hedge Fund Investments: Risk Management Perspectives *

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(Summary)

Hedge funds in Japan have recently been attracting more capital from institutional investors, including financial institutions. This paper highlights the relevant risk management issues for hedge fund investments.

An investor investing in hedge funds requires a different risk management procedure from the investor investing in traditional securities. This is because the investor is actually investing in the hedge fund managers' investment skills and needs to monitor multiple entities involved in the hedge fund's business operations. As a result, investors have improved their risk management, but this is still an ongoing process. This paper describes the structure of a risk management procedure for investing in hedge funds. It does so by providing examples of key elements that have emerged through discussions held with various market participants, including financial institutions, by the Bank of Japan's Financial Systems and Bank Examination Department.

For an investor, the cost required to construct a proper risk management framework depends on factors such as the size of their investment. Nonetheless, investors need a risk management framework that enables the sufficient evaluation of all possible risks before beginning the investment, and the proper monitoring of these risks on an ongoing basis. This is the risk management principle for investing in hedge funds. In order for risk management to be effective, investors need to request hedge funds to provide them with enough qualitative (e.g. management policies) and quantitative (e.g. performance) information. It is important for an investor to follow this principle, and to first develop a proper risk management framework commensurate with the size and risk profile of their investment.

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1. Introduction

Hedge funds in Japan have recently been attracting more capital from institutional investors, including financial institutions.[1] Unlike direct investment in conventional securities, such as straight bonds or stocks, hedge fund investment is through an outside third party. The investor entrusts their assets to be managed by a private fund.[2] The source of profitability in hedge funds comes from the fund manager's investment skills: this means that investing in hedge funds can be considered as an investment in the skills of the hedge fund manager. It is also difficult for investors investing in hedge funds to grasp the details of the fund's positions on a real-time basis. Moreover, multiple entities are involved in the hedge fund's business operations since it typically outsources many of its activities, including transaction settlements, Net Asset Value (NAV) calculations, and the custody of assets, to outside service providers.

Consequently, all investors need to fully review the hedge fund's investment policies/strategies, the reputation and performance of the manager, along with the overall structure of the fund, before making a decision on whether to invest. Once the investment is made, the investor then needs to confirm that the fund is operating properly, not only through the quantitative analysis of its performance, but also through regular qualitative monitoring, including areas such as compliance with the investment policies agreed upon in the contract. The investor also needs to monitor any replacements of service providers. If through these monitoring processes investors identify any inadequacies in the fund's management or operations, they need to consider, for example, whether to take further measures, such as redeeming the investment.[3] In order for such risk management to be effective, investors need to request hedge funds to

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[1] For recent trends and regulations regarding hedge fund investment, see Financial Systems and Bank Examination Department and Financial Markets Department, Bank of Japan [2006], and Financial Services Agency [2007].

[2] President's Working Group on Financial Markets [1999] defines a hedge fund as '…the term encompasses any pooled investment vehicle that is privately organized, administered by professional investment managers, and not widely available to the public.'

[3] Risk Management Forum (Alternative Investment Session) [2006] provides guidelines for risk management in hedge fund investment, with varying perspectives of financial institutions, pension funds, investment trust companies, and investment advisors.

provide them with sufficient qualitative (e.g. management policies) and quantitative (e.g. performance) information.

The risk management procedure for hedge fund investment must reflect the aforementioned features. Investors have been steadily improving these procedures, but this is an ongoing process. This paper describes the structure of a risk management procedure for investing in hedge funds, by providing examples of key elements that have emerged through discussions held by the Bank of Japan's Financial Systems and Bank Examination Department with various market participants, including financial institutions.

For the investor, the cost required to build up a proper risk management framework depends on factors such as the size of their investment. Nonetheless, investors need a risk management framework that enables them to sufficiently evaluate all possible risks before beginning the investment, and properly monitor these risks on an ongoing basis. This is the risk management principle for investing in hedge funds. Therefore, it is important for an investor to follow this principle, and to first develop a proper risk management framework commensurate with the size and risk profile of their investment.

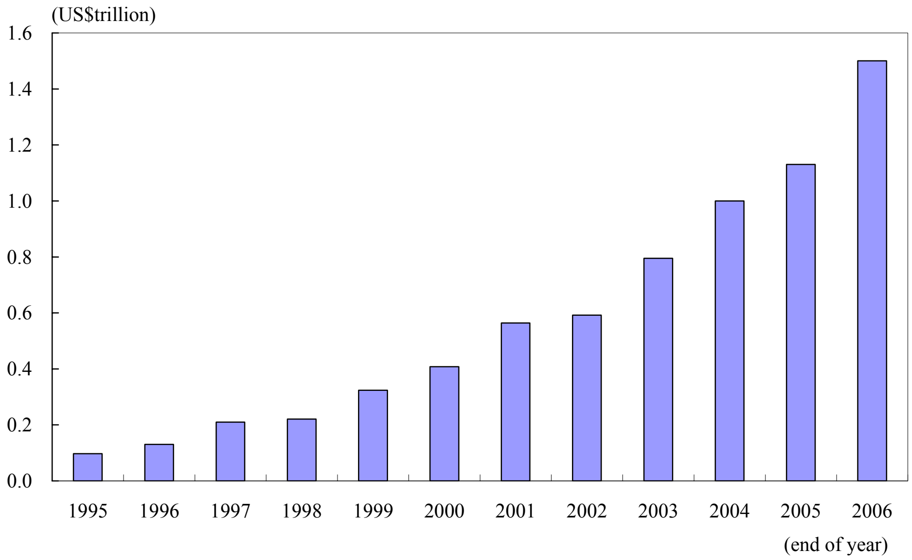
The structure of this paper is as follows. Chapter 2 describes the historical changes in the volume of hedge fund investment. The chapter also details the organizational structure of hedge funds and provides an overview of the related entities, and the frequencies and scope of information disclosure. Chapter 3 describes several cases where inappropriate business operations by hedge funds caused investment losses. Chapter 4 describes the risk management procedure for investing in hedge funds, divided into three phases: establishment of a risk management framework, preinvestment review, and ongoing monitoring. Chapter 5 concludes the paper.

2. Size, structure, and information disclosure frequencies and scope of investment in hedge funds

(1) Historical changes in the volume of hedge fund investment

The global volume of investments in hedge funds has been increasing. The outstanding balance as of year-end 2006 is 15 times larger than in 1995 (see Figure 1).

[Figure 1] Global outstanding balances of hedge fund investments

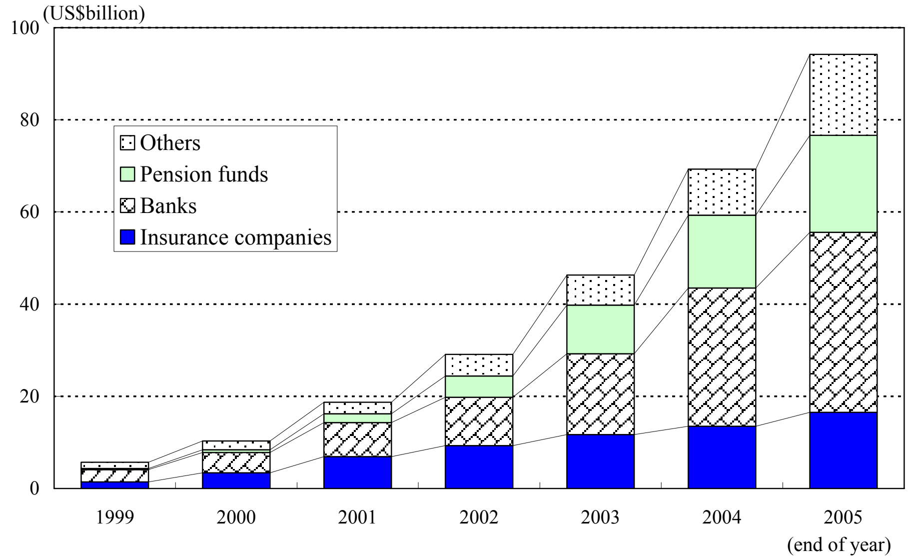


Source: Hennessee Group LLC, International Financial Services, London

Such a global trend has also boosted hedge fund investments in Japan. Most investors are institutional, including banks, life and nonlife insurance companies, and pension funds (see Figure 2).[4]

[4] In Japan, hedge fund investments, including investments in the funds of hedge funds (the fund that invests in several hedge funds), are usually made directly in foreign funds or through private investment trusts founded in Japan.

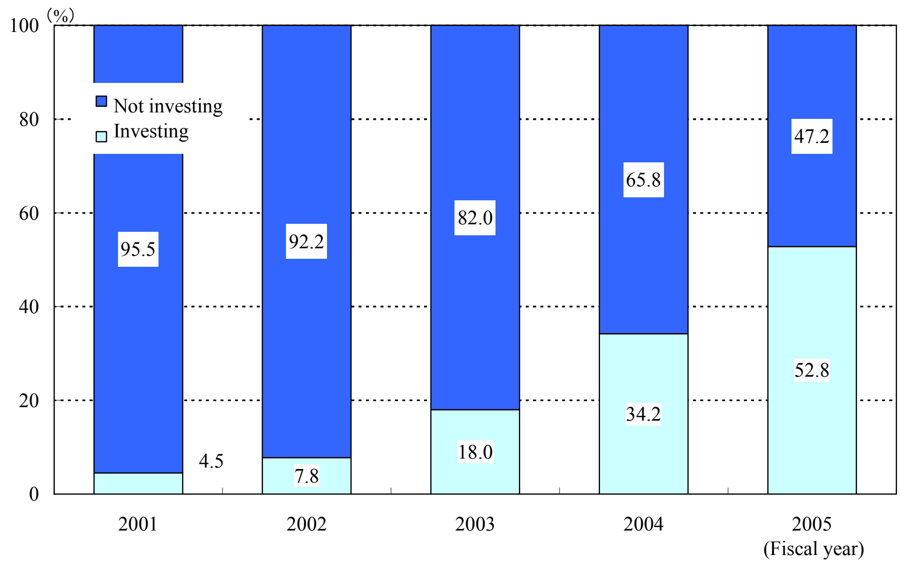
[Figure 2] Outstanding balance of hedge fund investments by Japanese investors (estimated numbers)



Source: Alternative Investment Products Co., Ltd.

There is little public information on the trend in hedge fund investments by Japanese investors. Itaya [2007] provided details of the investments in hedge funds by corporate pension funds. According to this report, the percentage of corporate pension funds that conduct alternative investments has been increasing in recent years (Figure 3). In fiscal year 2005, corporate pension funds that have made alternative investments invested more than 70% of the total amount in hedge funds.

[Figure 3] Alternative investments by corporate pension funds



Source: Figure 4 in Itaya [2007]

(2) Structure

A hedge fund consists of two entities: a vehicle that pools investors' capital, and an investment management company that actually manages the funds.[5] However, a fund usually outsources various operations to third-party companies, known as service providers (see Table 1). Most major investment management companies have a front office, a back office, and a risk management department. The risk management department usually assesses the risks of the investments made by the front office.[6] The back office internally checks the positions managed by the front office against the positions reported by their prime brokers, and checks the market values of the managed assets against the values evaluated by the administrator.

[Table 1] Major service providers for hedge funds

Service provider type	Function	Main operations
Prime broker[7,8]	Transaction settlement, securities lending, financing	• Settles transactions requested by hedge fund management companies (managers) • Provides securities lending and financing to funds • Provides services such as a risk management information service
Administrator	Administrative operation services	• Acquires transaction information from prime brokers, records it to keep books, and performs clerical work for maintaining accounts and other legal and tax-related work as required • Evaluates the market values of the managed assets, calculates the NAVs and incentive fees, and reports the results to investors
Custodian	Custodial services	• Manages money transfers when applying and redeeming funds, and keeps assets (e.g. securities, deposits) owned by the funds

Some prime brokers (and their affiliate companies) provide hedge funds with custodial services and/or other services such as risk management tools. When new hedge funds are established, some prime brokers additionally provide expertise, introduce potential investors, and extend support in actual investment operations.

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5 For the structure of hedge funds, see also Financial Systems and Bank Examination Department and Financial Markets Department, Bank of Japan [2006].

6 The risk assessment process may also use risk management tools provided by the prime brokers.

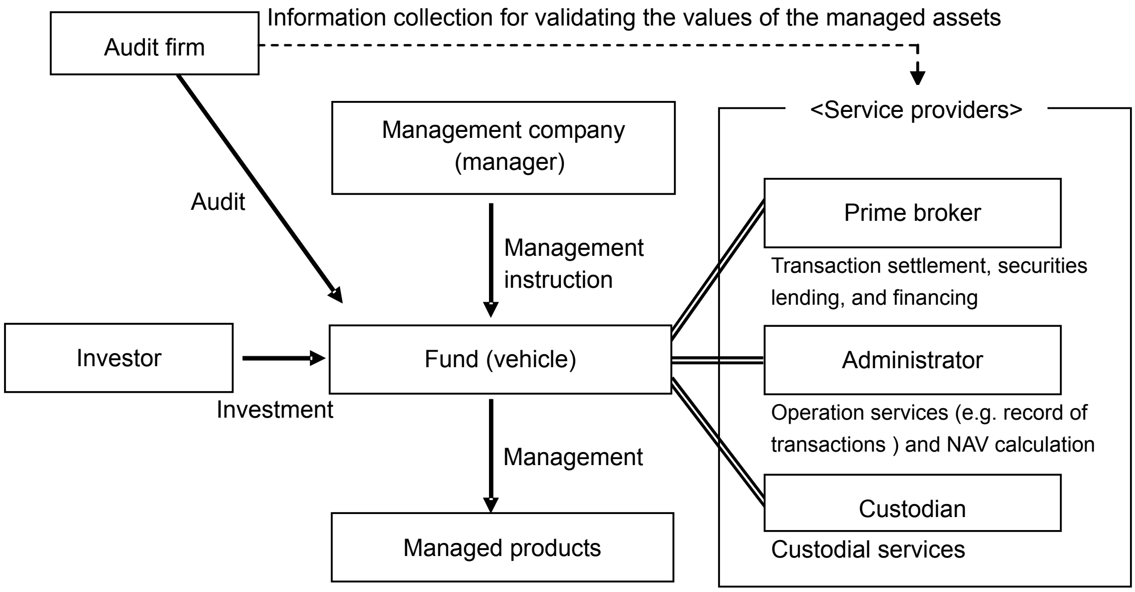
7 Most prime brokerage services are outsourced to major US or European financial institutions. A hedge fund may use several prime brokers.

8 Brokers other than prime brokers (referred to as executing brokers) may also be used.

Usually, an outside firm audits the hedge fund and validates the value of its assets. The audit report is then sent to the fund investors.

Figure 4 shows the structure of a hedge fund and its related entities.

[Figure 4] Structure of a hedge fund and its related entities



Funds (vehicles) are usually classified into the following three types.[9]

1) Unit trust (contract-type investment trust)
2) Limited partnership
3) Corporation

The trustee (e.g. trust companies) in 1), the general partner in 2), or the company board in 3) is responsible for selecting service providers and for evaluating the assets.[10]

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9 See, for example, Mitsusada and Shiraki [2006].

10 For 2), the general partner that manages the fund is also usually an investor in the fund. With 3), most of the board members who manage the fund (vehicle) have connections with the manager of the management company. For these reasons, Horie [2007] argues that the manager responsible for asset management may not be well controlled.

(3) Frequency and scope of information disclosure

Generally, hedge funds provide information on their performance and NAVs on a weekly or monthly basis, and other information, such as exposures, major positions, strategic allocations, and comments on market environments and management status, on a monthly or quarterly basis.

However, it is generally difficult for investors to grasp fund positions on a real-time basis because managers are reluctant to provide detailed information on the fund's investment strategy. This reluctance stems from concerns that the detailed provision of information increases workloads and may also affect future performance if information on investment positions, as the source of their profits, is passed on to third parties.

3. Inappropriate operations in hedge funds

This chapter draws from various public documents to provide an overview of cases where improper operations in hedge funds (for example, improper partnerships) caused losses.

(1) Cases where losses arose from the mutual dependence of the parties involved in the fund

- Manhattan Investment Fund

Manhattan Investment Fund (MIF)[11] experienced significant losses by short-selling stocks during the US information technology bubble, but kept creating false reports stating that MIF was regularly making profits in collusion with one of its execution brokers, Financial Asset Management (FAM). This was revealed in 2000. FAM had a personal connection with MIF's top executive and around 30% of FAM's profits were from orders by MIF.

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[11] For the background on MIF's losses, see Toshino [2002].

- Bayou Management

Bayou Management[12] (BM) changed its audit firm to a dummy accounting firm in order to conceal investment losses that had ballooned since its establishment in 1996. The dummy accounting firm, 'Richmond Fairfield Associates', was established by a person who had a connection with BM. The firm fabricated BM's accounting audit reports and distributed false reports to investors stating that the funds managed by BM had been making profits.

(2) Cases where losses arose from excessive leverage and changes in management style[13]

- Long-Term Capital Management

Long-Term Capital Management (LTCM)[14] initially made profits through its strategy of fixed income arbitrage.[15] However, as profitability decreased, LTCM started adopting other strategies, using high levels of leverage to take larger positions. In August 1998, as Russia's financial problems became known, the 'flight-to-quality' that resulted from credit risk concerns reduced market liquidity, and LTCM finally ended up taking enormous losses when closing its positions.

- MJ Select Global

MJ Select Global (MJSG)[16] subcontracted their investment management to Global Arbitrage Development (GAD) and achieved high returns based on GAD's strategy of dealing with the arbitrage of stocks and options. However, because of continuous

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[12] For the background on BM's losses, see Securities and Exchange Commission [2005].

[13] If the fund management style is changed without notice to investors, it is referred to as 'style drift'.

[14] For the background on LTCM's losses, see Jaeger [2002] and President's Working Group on Financial Markets [1999].

[15] For an overview of major hedge fund strategies, see Financial Systems and Bank Examination Department and Financial Markets Department, Bank of Japan [2006].

[16] For the background on MJSG's losses, see Toshino [2002].

capital inflow to MJSG, GAD's investment volume grew larger, which made it increasingly difficult for GAD to maintain its high performance. As a result, GAD started investing in multiple funds ('fund of funds' investment) without giving notice to MJSG.

In 2001, MJSG's customers requested large amounts of redemptions. However, because GAD had invested a significant amount in private equity funds, which are usually extremely difficult to liquidate, GAD could not cash out a sufficient amount of assets and MJSG was forced into liquidation.

- Amaranth Advisers

Amaranth Advisers (AA) [17] had previously deployed multiple strategies (a multistrategy fund). However, in 2006 it invested a large share of its assets in the energy markets and took a large position speculating on the widening calendar spread in natural gas futures. However, in September of that year, natural gas prices fluctuated in a different manner than the fund manager expected, causing AA to incur enormous losses.

Such inappropriate accounting and excessive risk-taking could happen in other investment vehicles, not only in hedge funds. For investors, effective preinvestment evaluation and continuous monitoring, based on a structured risk management system (described later in the paper), are essential for preventing these types of losses.

Focus areas and the depth of evaluations and monitoring will vary depending on the investment type. For hedge fund investments, as the aforementioned loss cases indicate, it is important that investors evaluate the skill and credibility of the fund manager, as well as the fund's management framework, 'before' making the investment. The cases also indicate that the investor needs to monitor the fund 'regularly' to check whether the fund is conducting transactions that conform to the management policies specified in the contract, and to check whether the service providers and the audit firms involved are qualified.

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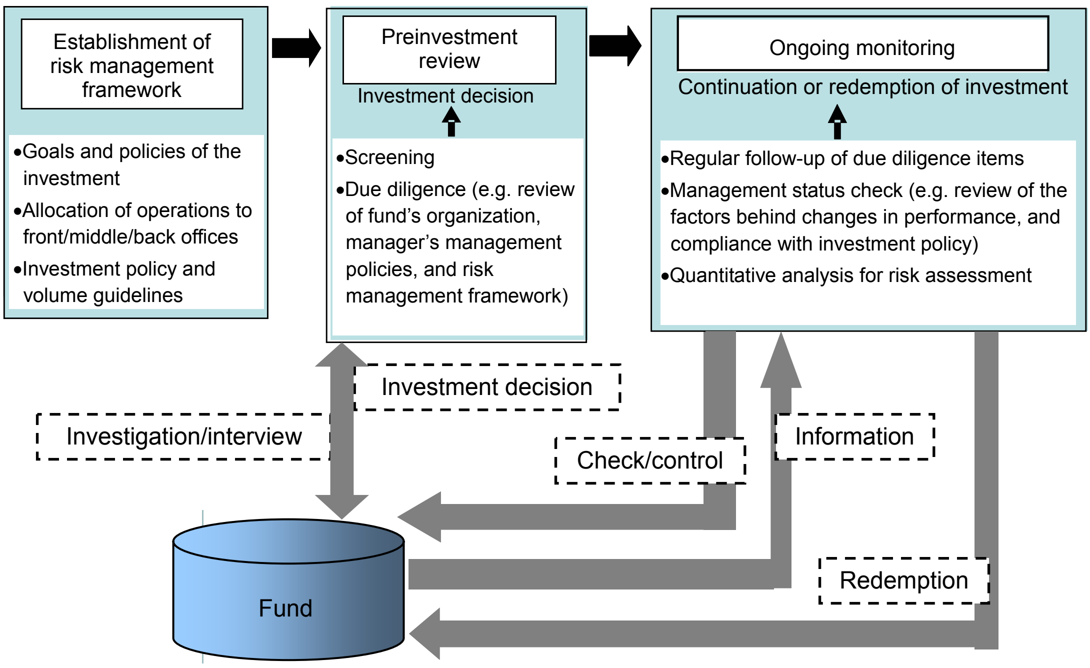
[17] For the background on AA's losses, see Till [2006] and Chincarini [2007].

4. Risk management procedures for investing in hedge funds

This chapter describes a risk management procedure for investing in hedge funds. The focus is on the risks involved in relying on the investment manager, as well as those involved with the operational aspects of the entities involved in the investment process.

The risk management procedure described here is divided into the following three phases (assuming that an investor invests in an individual fund, not a 'fund of funds'): 1) establishment of a risk management framework; 2) preinvestment review; and 3) ongoing monitoring (see Figure 5).

[Figure 5] Overview of risk management for investing in hedge funds



In hedge fund investments, there are also investments in 'fund of funds'. In such cases, an agent, known as the 'gatekeeper', provides investors with advice on investing in hedge funds. The gatekeeper usually directly manages the fund of funds. On behalf of the fund of funds investors, the gatekeeper manages the risks involved with the individual hedge fund investments.

The risk management procedure described in this chapter, though targeted at the investor who makes direct investments in an individual fund, also applies to investments made by a gatekeeper in an individual fund within a fund of funds. It is most important for the investor in a fund of funds to interact frequently with the gatekeeper in order to judge whether the gatekeeper is properly managing the risks involved with the investment.

(1) Establishment of a risk management framework

Before beginning hedge fund investments, the investor, as in proprietary trading, determines the goals and policies of the investment and establishes a risk management framework, allocating operations to the front, middle, and back offices. The relevant internal committee, which involves senior management (e.g. the ALM committee), will be responsible for this process.

In hedge fund investments, unlike bond or stock trading, the front office does not directly perform transactions, rather it monitors the hedge fund manager. The front office is partly responsible for risk management.

In addition to the risk management (monitoring) performed by the front office, the middle office also manages the risks, not only in the hedge fund investments, but also in other investments from an organization-wide perspective. In order to check the front office's activities, the middle office also reviews the hedge fund's investment policy and obtains the information required to measure fund performance and assess risks.

The internal audit department regularly and on an ad-hoc basis where necessary verifies whether the front and middle offices are properly performing their risk management duties, and whether the checks and balances are working effectively.

Based on the overall risk management framework, in each period the investment policy and volume guidelines (e.g. the notional investment limit, the risk limit, and the maximum loss limit) for the fund investment are decided, for example, in the investor's ALM committee. The investor also specifies the elements and methods of monitoring and reports to senior management the actions to be taken if various risk limits are breached or are likely to be breached.

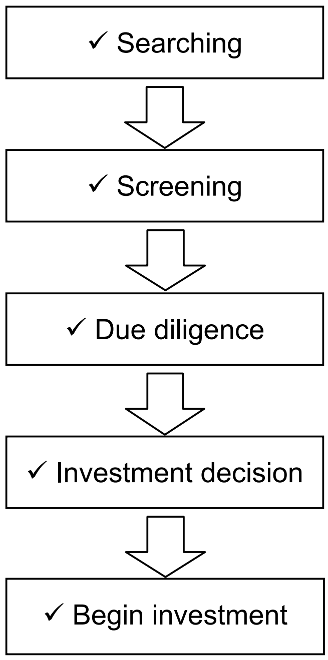
Although the amount of available information and its frequency vary between individual investments, the middle office specifies beforehand the basic risk calculation rule on which the risk amounts are assessed against the limits.

(2) Preinvestment review

a) Procedure before beginning hedge fund investment

Before beginning hedge fund investment, the investor reviews whether the fund satisfies the requirements set by the investor (due diligence). Figure 6 shows a typical procedure.

[Figure 6] General procedure for beginning hedge fund investments



✓ Searching for the appropriate fund

The investor seeks funds that match their investment goals and policies. A hedge fund that is expected to achieve high performance usually obtains investment capital within a very short time. The number of new investors who can subscribe to this fund is limited, even if the fund reopens, because existing investors provide most of the additional funds. Therefore, in order to find good investment opportunities, the investor tries to obtain information on specific hedge fund managers, not only from service providers such as prime brokers, but also from various other information sources inside the hedge fund industry, using personal connections.

✓ Screening

The investor obtains basic information on possible candidate funds (e.g. performance records of accomplishment, investment policy/strategy overview, sources of returns, target and achieved values for returns and risks, and redemption policies). The investor also checks the hedge fund manager's management policies/strategies against the investor's investment policies. The investor compares the performance data between the candidate hedge funds and those already invested in by the investor. In addition, the investor estimates the expected improvement in portfolio performance through investment in the fund. The investor then decides whether the investment in the fund should be considered more extensively.

✓ Due diligence

For funds that have passed the screening process, the investor performs due diligence. Under due diligence, the investor thoroughly reviews the investment policies/strategies and the risk management framework of the fund through interviews with the hedge fund manager (and the service provider if required). Details about due diligence are described later in this chapter.

✓ Investment decision

Investment in funds that passed due diligence is approved, following prespecified policies and procedures.

✓ Begin investment in the hedge fund

b) Specific due diligence items

This section describes the major due diligence items for investing in a hedge fund. Most due diligence items are intended to review the risk management framework of the fund and the reliability of the hedge fund manager, since these are important (as explained in the cases of MIF and BM in Section 1 of Chapter 3).

When performing due diligence, the investor tries to obtain an accurate as possible picture of the actual status of the fund, mainly through carefully conducted interviews with the manager. The investor also analyzes whether the fund is suitable for their portfolio.

——— The investor does not automatically judge the hedge fund's appropriateness by simply applying numerical criteria to the fund's performance history. In such a competitive industry where new funds enter the market frequently, it is difficult for a specific fund to continue making profits for a long period. Thus, funds with a long history of good performance tend to be viewed positively. However, even if the investor sets specific numerical criteria on the fund's history (for example, 'the hedge fund must have been in business for three years or more'), not all hedge funds that meet the criterion may be appropriate to invest in. This is because despite a long company history, a hedge fund may be looking for new investors to fill places left open by customers who have redeemed their investments because of the fund's low performance.

i) Hedge fund manager skills, integrity, and reliability

Taking into consideration the manager's past performance, background, fund history, and reputation in the industry, the investor reviews whether the manager has qualified investment skills, and whether there are any ongoing disputes with their investors. The investor also checks whether the fund's fee structure is appropriate, and whether the manager is taking downside risks by investing their own capital in the fund.

——— Usually a fund manager's fee is commensurate with fund performance. Hence, the manager has an incentive to report performance higher than the actual results. To confirm the reliability of the performance reported by the hedge fund manager, the investor at least reviews whether the fund has a system where the administrator can independently evaluate fund performance, and whether the administrator can appropriately evaluate the fund's complicated positions. See iv) Organizational structure of the hedge fund.

ii) Hedge fund manager policies and strategies

The investor reviews whether the hedge fund manager has a clearly specified portfolio management policy/strategy, whether the manager's product selection process and portfolio construction method is appropriate from the investor's perspective, and whether the manager's investment policy/strategy can effectively capture investment opportunities. The investor also checks whether the manager maintains leverage within an appropriate range, and how much additional investments the manager can accept.

iii) Hedge fund manager risk management policy and framework

The investor reviews whether the manager's risk management policy, risk assessment method, and risk monitoring system are properly organized, and whether the risks in the management policy/strategy are properly assessed and understood. The investor also checks whether the hedge fund manager's risk management framework takes into consideration the possibility of significant market fluctuations (for example, scenario analyses based on past market fluctuations).

iv) Organizational structure of the hedge fund

The investor checks whether the fund is registered with the relevant regulatory authority. In addition, the investor reviews the fund's organization structure, including service providers and audit firms, the relationship between the fund and its management company, the checks and balances between the hedge fund manager's front and back offices, and the framework for evaluating the market values of managed assets. The investor also examines the independency of the service provider and the audit firm (whether they are independent from the manager in terms of capital and/or personal connections), the service providers' capacity, the operational risk management framework of the service providers, and the business continuity plans of the fund. Lastly, the investor also considers the possible existence of investors whose investment redemptions could significantly influence the fund's operations.

——— In particular, the market value of managed assets is used as the basis for the evaluation of performance and risk. Thus, it is important for the investor to check whether the fund has a framework for properly valuing assets under management.[18]

v) Hedge fund risks and returns

The investor checks whether the target values of returns and risks are reasonable from the investor's perspective, taking into account the fund's past performance, management policy/strategy, and the market environment. The investor also reviews whether the size and reasoning underlying the past decreases in the fund's NAV are acceptable from an investor perspective.

vi) Redemption policies of the fund

The investor checks the length of the lock-up period[19] during which redemptions are not possible, redemption frequency and timing, the time required to actually receive funds after requesting redemption, and the redemption fees.

——— The investor reviews the redemption policies and possible liquidity risks involved with the fund investment,[20] since there is usually a fairly long period

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[18] There have been several documents published since 2006 concerning the calculation of the market values of a hedge fund's managed assets. These documents describe the appropriate practices for specifying its policies and processes. For example, 'good practice points' for calculating the market values of managed assets by the manager were described in an open letter from the Financial Services Authority to the International Organization of Securities Commissions (see Financial Services Authority [2006]). International Organization of Securities Commissions [2007] also suggests some principles in the proper calculation of the market values of a hedge fund's managed assets. See the 'BOX' for details.

[19] Usually, an investment in a hedge fund is bound by terms and conditions that forbid redemption for a certain time after the contract. This is a 'lock-up agreement' and the time-period is known as the 'lock-up period'.

[20] Generally, a hedge fund investor is bound by liquidity constraints. For example, if the investor cancels the investment on a predefined redemption date (e.g. quarterly), the investor must notify the redemption to the fund before the redemption date arrives (e.g. 30 days prior to the redemption date),

of time between the request for redemption and actual receipt of the invested funds.

- Although sufficient access to liquidity is important for investors, it cannot always be said that a shorter redemption frequency results in a more favorable investment. If the redemption frequency is short, the number of investors who immediately redeem investments may increase in the case of a temporary downturn in the fund's performance. In such a situation, the hedge fund manager would need to maintain sufficient liquidity and could be hampered in employing a strategy that aims at higher returns in the medium to long term. If redemption requests increase, the fund would also need to close its positions within a short time, which may exacerbate losses. Therefore, the investor examines whether the hedge fund's redemption frequency is appropriate in light of the fund's investment strategies and the investor's own risk management guidelines.
- The investor also checks how the fund manages its cash position in order to prepare for redemptions (e.g. how much cash is in reserve, and how it will react to redemption requests, especially if the fund invests in illiquid assets). Investments in illiquid assets can constrain the fund in obtaining sufficient cash to fulfill any requests for redemption. This can sometimes directly lead the hedge fund into failure or liquidation, as described in the cases of LTCM and MJSG in Section 2 of Chapter 3. Furthermore, following LTCM's failure, some hedge funds began to reserve the right to limit redemptions, by establishing a 'gate'.[21] The investor, therefore, also reviews the conditions of the gate, since it could limit redemptions too strictly.

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and it takes a certain amount of time to receive the capital following redemption. In addition, a lock-up period is often set.

[21] In a hedge fund investment, the contract sometimes includes the manager's right to limit redemption if the total amount of the requests for redemption exceeds a predefined level of the hedge fund's entire assets. This right is referred to as a 'gate'.

vii) Frequency and scope of the information provided to investors

The investor reviews the information that is provided by the fund manager (e.g. investment policies/strategies, asset allocation, liquidity of the managed assets, methods and timing of market valuation, and major risk factors). The investor also checks whether certain investors are provided with an advantage (e.g. having redemption privileges not specified in the terms and conditions).[22]

——— Investors in hedge funds identify the qualitative and quantitative information required for risk management, and request the fund to provide this information. Based on both the qualitative and quantitative information provided, the investor performs preinvestment reviews and ongoing monitoring (described later in this paper).[23]

(3) Ongoing monitoring

In monitoring a hedge fund investment, the investor checks whether the target values of return and risk set at the time of the initial investment are fulfilled by comparing the target values with the actual results. The investor also reviews whether the investments made by the fund manager are being executed according to the fund's investment policies/strategies. This process often provides a better picture of the current state of the hedge fund's investment portfolio, which may help the investor interact in a more detailed way with the fund manager. The investor also uses the data regularly provided by the fund manager and the administrator (e.g. NAVs) to conduct quantitative analysis of the investment in the fund. The investor can use this information in communications with the hedge fund manager.

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[22] For a discussion of these privileges, see the industry guidance report Alternative Investment Management Association [2006] published in September 2006 by the Alternative Investment Management Association based on discussions with the Financial Services Authority. This guidance describes the disclosure of the 'side letter' (an individual agreement note made between certain investors and the manager regarding the fund, aside from the agreement common to all investors in the fund) in a hedge fund investment.

[23] For information disclosure to hedge fund investors, see Financial Stability Forum [2007].

The following are the key points in monitoring a hedge fund investment.

a) Regular follow-up of due diligence items

After the initial investment, the investor carefully examines the regular reports sent by the fund and conducts regular follow-ups of the due diligence items reviewed before making the investment. This can be through regular questionnaires or meetings with the fund manager. The aim is to see whether there have been any changes in the reliability, policies/strategies of the fund manager, and in the organization of the fund. The investor also monitors significant events at the hedge fund (e.g. resignation of key staff). One of the more effective ways would be to ask the same questions to the manager at every meeting or contact and see if there is any change in response. With regard to the organizational structure of the hedge fund, the investor would review the financial accounts received regularly from the fund, for example, to find any replacement in service providers, since these are not always reported to investors.

b) Monitoring the hedge fund's positions and performance

Through regular reports from the fund and interviews with the fund manager, the investor reviews the major positions of the fund, the factors behind changes in performance, confirms whether the fund is performing proper risk management, and reassesses the manager's policies/strategies. For example, the performance of a fund that has a large holding of energy-related company stocks would be expected to deteriorate if energy prices go down. If the manager reports performance different from those anticipated by the investor, the investor could obtain a better understanding of the fund's investment strategy by discussing with the manager the background that led to changed performance.

Even though each hedge fund may possess a well-diversified portfolio, the investor's overall hedge fund portfolio may be concentrated in certain names or positions. The investor checks the concentration risk of the total investment in hedge funds. Although it is usually difficult for the investor to know all of the products and positions of a fund, the investor can assess the overall concentration risk of their hedge fund portfolio by acquiring as much information as possible about the key names and positions included in the fund. This can be through regular interviews with the hedge fund manager or through regular reports provided by the manager. If any major risk concentrations are identified, the investor reduces the risks in the overall hedge fund portfolio through redemption and the transfer of funds to another fund.

c) Monitoring compliance with investment policy

Based on regular reports provided by the fund manager, the investor checks the possibility of whether transactions that exceed predetermined investment limits or do not conform to investment policies/strategies agreed in the contract have been conducted. The investor, for example, reviews the actual level of leverage against the target set out in the guidelines. If there are concerns about compliance, the investor immediately contacts the fund manager to confirm the actual status. If noncompliance is confirmed, the investor considers withdrawing their investment.

The investor checks the background not only when performance is low, but also when performance is high, because hedge funds may achieve high performance through noncompliance with investment policies agreed in the contract; for example, an increase in leverage beyond the predetermined level.

The hedge fund’s NAVs are also compared with the audit reports for consistency. If there are any discrepancies, the investor checks the actual status and the possibility of misconduct by the entities involved in operating the hedge fund.

d) Quantitative analysis of the hedge fund investment

It is helpful to combine quantitative analysis with qualitative analysis in the monitoring of hedge fund investments. As described earlier, detailed position information is usually not provided to investors, and the NAVs are normally reported only on a weekly or monthly basis. Therefore, the possibility of detailed quantitative analysis is limited. However, by combining quantitative analysis with qualitative evaluations, the investor can have discussions that are more concrete with the fund manager regarding issues such as investment performance. The results of quantitative analyses can also be utilized in the interactions between the investor's front and middle offices.

Some of the quantitative measures include standard deviation, the Sharpe ratio, Downside Deviation, Maximum Drawdown, and Value at Risk (VaR). These indicators may not only be included in the hedge fund manager's regular reports, but may also be calculated by investors.

However, if the hedge fund is relatively new, there may not be sufficient historical data for a robust quantitative analysis. In this case, the indicators are supplemented, for example, with data from a fund previously managed by the same fund manager employing the same strategies as the current fund, and with data from hedge fund indices[24] such as the Credit Suisse/Tremont Hedge Fund Index or the HFRX Global Hedge Fund Index. The reliability of the quantitative analyses calculated with supplementary data is checked through regular discussions with the manager. For example, if a hedge fund index is used as supplemental data, differences between the index and the individual fund's performance[25] will exist because the index is derived from performance data collected from multiple funds. In addition, the index itself is influenced by various biases.[26]

Among the quantitative measures, VaR numbers provide a probability calculation of the risks involved in the hedge fund investment. It generally takes time to receive the capital after the redemption request (see Footnote 20), especially since a hedge fund may have a lock-up period. This would have to be taken into consideration in defining the holding period (risk assessment period) for calculating the VaR for hedge fund investments (see Figure 7). For example, the hedge fund holding period is at least three months in the VaR calculation, if it requires three months to receive back funds from the time when the redemption is decided upon until the predetermined redemption date.

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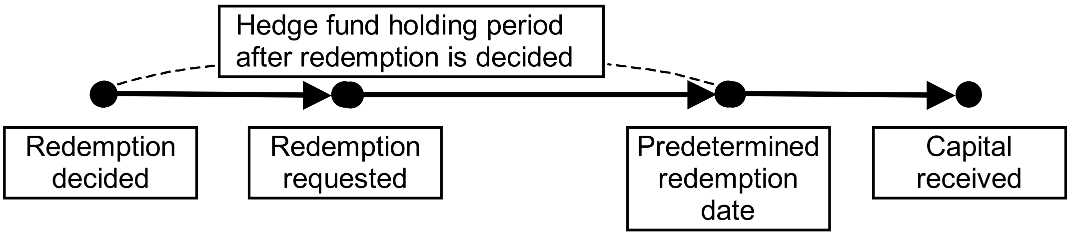
[24] Hedge fund indices are typically available for each major strategy.

[25] In particular, the standard deviation of an individual fund's returns may be underevaluated if the individual fund's data is supplemented by indices derived from the performance data of multiple funds. It must also be noted that the VaR of an individual fund may also be underevaluated.

[26] The biases include a survival bias (bias caused by the exclusion of extinct funds from the index calculation) and a retrospective bias (bias caused by the tendency of funds to report only good performance data).

If the VaR is calculated, the appropriateness of the assessment is reviewed through back testing.

[Figure 7] Hedge fund holding period specification



e) Stress tests

The stress tolerance of the overall hedge fund investment portfolio can be examined by performing a stress test, in addition to the VaR analysis. In particular, even if a portfolio is well diversified under normal market conditions, a large market fluctuation could increase the correlation in fund performance or cause concentrated redemptions within a short time, leading to a shortage of cash reserves. In addition, it usually takes a long time to liquidate the managed assets, so the hedge fund may not be able to fulfill redemption requests from investors within a prespecified time-period. This could result in an actual extension of the redemption period.

A stress test involves simulating extreme market conditions. This enables the investor to estimate how many losses may materialize in a hedge fund portfolio and the entire portfolio, and to prepare for the projected risks as a part of its risk management.

Table 2 shows an example of a stress test. In this example, the investments are made in four strategies,[27] in each of which an amount of 1,000 (market value) is invested, with a holding period of six months. The estimated stress loss (294.0) is the sum of the change in the value of investments in each strategy, calculated by multiplying the investment amount by the rate change of the hedge fund index for six months, observed after the failure of LTCM (the hedge fund index is calculated from the historical data).

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[27] For an overview of the strategies, see Financial Systems and Bank Examination Department and Financial Markets Department, Bank of Japan [2006].

[Table 2] Results of the stress test using the rate of change observed after LTCM's failure[28]

	Investment amount	Holding period six months (August 1998–January 1999)	
		Rate of change	Change in value
Long/short equity	1,000	+8.19%	+81.9
Convertible arbitrage	1,000	–7.86%	–78.6
Global macro	1,000	–21.49%	–214.9
Event driven	1,000	–8.25%	–82.5
Total	4,000		–294.0

f) Reaction to performance deterioration

If hedge fund performance deteriorates, the background is checked with the fund manager. As described in b) in this section, a more accurate picture of the investment situation can be obtained through discussions with the manager. When the performance of the fund is deteriorating, the investor discusses performance with the manager and, if necessary, reduces the amount of investment. The investor may set in advance a redemption framework (loss-cut rule) to prepare against a performance deterioration that exceeds prespecified levels.[29]

If performance considerably deteriorates, though not to the extent that the loss-cut rule is applied, the investor will consider redeeming the hedge fund investment because the liquidity of hedge fund investments is usually low. It may be useful for the investor to set alarm points (or thresholds) at a lower level in order to consider the start of redemption procedures. The reaction of other investors may also influence the future performance of the fund in times of stress. If the investor can obtain information on other investors (e.g. pension funds, insurance companies, and banks) investing in the same fund, the investor may be able to decide whether to drawdown the funds by taking into account the other investors' investment and risk management strategies. Therefore,

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[28] In this example, the Credit Suisse/Tremont Hedge Fund Index is used.

[29] If the amount redeemed by the investors becomes significant, the hedge fund may not be able to hold its positions. In this case, it is closed (liquidated). Usually, the manager's commission is commensurate with the fund's performance, so the manager is more likely to close the fund if performance deteriorates.

it is important to regularly check for any significant change in the fund size and the type of investors investing in the fund.

It is also important to confirm in advance the time-period required to receive back capital, and the losses that may occur during the period if the fund investment is wholly redeemed. In Table 3, the investments are in four strategies, each of which has 1,000 invested, as in Table 2. The hedge fund index for each strategy is specified as the performance of each strategy, and the normal distribution is assumed for the index return rate.[30] If the redemption is decided at this point, there is a 1% possibility of incurring a loss of 178.3 in total until the investor receives the capital, and the time required to receive all capital is at least 150 days.

[Table 3] Projection of losses after redemption is decided[31]

Strategy name	Investment amount	Index return rate volatility × 2.33	Holding period after redemption is decided	Projected loss after redemption
Long/short equity	1,000	9.1%	95	–56.3
Convertible arbitrage	1,000	6.7%	121	–46.8
Global macro	1,000	6.3%	62	–31.3
Event driven	1,000	5.7%	150	–43.9
Total	4,000	–	–	–178.3

5. Conclusion

This paper describes a risk management procedure for hedge fund investments by providing examples of key areas based on discussions the Financial Systems and Bank Examination Department of the Bank of Japan has had with various market participants, including financial institutions.

Unlike a direct investment in conventional securities such as bonds or stocks, an investment in hedge funds is an investment through an outside third party. Therefore, it is essential for the investor investing in hedge funds to have a risk management framework and process that covers the risks in the reliability of the hedge fund manager

[30] In this example, normality is assumed for the purpose of simplification, but this assumption must be validated in risk management practice.

[31] In this example, hypothetical values are used for the index return rate volatility and the holding period after the redemption has been decided.

and the risks stemming from the multiple entities involved in the business operations of a hedge fund. The cost required to build up a proper risk management framework may vary depending on the relative position of the hedge fund investment in the investor's overall portfolio (e.g. size of the investment and its risk). Nonetheless, when considering these risks, the basic principle is to have a framework that enables the investor to evaluate all possible risks before beginning the investment, and to monitor these risks during the investment period.

In order for risk management to be effective, investors need to request hedge funds to provide them with sufficient qualitative (e.g. management policies) and quantitative (e.g. performance) information. Therefore, it is important for an investor to follow this principle, and to first develop a proper risk management framework commensurate with the size and risk profile of their investment.

If each investor establishes an effective risk management framework for hedge fund investments, this would work to effectively discipline hedge fund behavior. As a result, this should reduce the possibility of the materialization of unexpected losses. This may not only mitigate the losses for individual investors, but also stabilize the entire financial market.

Risk management procedures for hedge fund investments continue to evolve and improve. The Financial Systems and Bank Examination Department of the Bank of Japan will also continue to have discussions with those who are involved in the hedge fund industry, including financial institutions, to contribute to further improvements and developments in the risk management of hedge fund investments.

[BOX] Summary of papers on valuation of hedge funds

(1) Financial Services Authority [2006]

Financial Services Authority [2006] shows good practices for valuation of the assets of hedge funds in UK authorized managers.

1. There is a clear separation of duties between the portfolio managers and the back office.
2. Regular reconciliations of the positions take place between the back office of the manager and its prime broker(s). Comparisons of the valuations take place between the back office of the manager and its administrator(s).
3. Managers have a separate stand alone pricing policy document which is approved by the senior management of the firm. The document should be available to the administrator(s), prime broker(s) and other external parties specifying the pricing comparisons to be used and the procedures to be followed if discrepancies arise.
4. Managers have procedures in place for the day to day operation of the pricing process.

(2) International Organization of Securities Commissions [2007]

International Organization of Securities Commissions [2007] shows following nine principles for valuing the investment portfolios of hedge funds and the challenges that arise when valuing illiquid or complex financial instruments. The principles are designed to mitigate the structural and operational conflicts of interest that may arise between the interests of the hedge fund manager and the interests of the hedge fund.

1. Comprehensive, documented policies and procedures should be established for the valuation of financial instruments held or employed by a hedge fund.
2. The policies should identify the methodologies that will be used for valuing all of the financial instruments held or employed by the hedge fund.
3. The financial instruments held or employed by hedge funds should be consistently valued according to the policies and procedures.
4. The policies and procedures should be reviewed periodically to seek to ensure their continued appropriateness.
5. The Governing Body should seek to ensure that an appropriately high level of independence is brought to bear in the application of the policies and procedures and whenever they are reviewed.

6. The policies should seek to ensure that an appropriate level of independent review is undertaken of the individual values that are generated by the policies and procedures and in particular of any valuation that is influenced by the Manager.
7. A hedge fund's policies and procedures should describe the process for handling and documenting price overrides, including the review of price overrides by an Independent Party.
8. The Governing Body should conduct initial and periodic due diligence on third parties that are appointed to perform valuation services.
9. The arrangements in place for the valuation of the hedge fund's investment portfolio should be transparent to investors.

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