# Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management

## Report of
## The President's Working Group on Financial Markets

Department of the Treasury


Board of Governors of the Federal Reserve System


Securities and Exchange Commission


Commodity Futures Trading Commission


April 1999

**Date:** 4/29/99 5:21 PM
**Sender:** Jerry Quinn
**To:** EvEhr@aol.com
**cc:** Marc Lackritz; Stuart Kaswell; James Spellman
**Priority:** Urgent
**Subject:** Draft of Hedge Fund Paper

Ev:

I think the paper is quite good, but I do have one major concern, and one significant question.

The concern, of course, relates to the discussion of leverage in the paper. Depending upon how our larger firms react to the President's Working Group's ("PWG") Report that arrived today, my concern might either abate considerably or, conversely, increase. You'll recall at the meeting on March 19th how sensitive the industry representatives (most of whom are working with the "Wisemen" Policy Group) were with respect to leverage. My notes from the meeting reflect not merely that they wished to do away with the fifth point of your draft (*Hedge funds are not generally highly leveraged and therefore prone to risk)* they also expressed the wish that we not say anything at all about leverage! Given that the PWG was straightforward in saying that hedge funds are not the primary problem (though they seem the targets of some additional regulation) and that leverage is the key issue (and noting that some banks and securities firms are at least as highly leveraged as was LTCM) perhaps their hostility will have lessened, but perhaps not. I can well imagine one of the industry guys saying something like "Your paper is good public policy and helps to put hedge funds in a fairer light, but I pay dues to the *Securities Industry* Association, not the Hedge Fund Association or some think tank."

My question relates to the use we intend to make of the paper. If we use it as a briefing piece for Congressional staffers, I can imagine that while they might want to shade the discussion of leverage a bit, their objections would be fairly limited. However if we simply publish it, at least without a substantial re-write (perhaps so that it becomes more an industry commentary on the PWG Report than a simple hedge fund piece) I fear that some guys might take strong objection. Again, their reaction to the PWG report might give us an indication of their likely response to your paper.

I have one or two relatively minor suggestions on the draft which I'll pass along if you like. But I'll hold off circulating the draft outside of SIA until I get a green light.

Jerry

**Date:** 4/29/99 4:15 PM
**Sender:** James Spellman
**To:** Margaret Draper; Kerrie Idiart; Dan Michaelis; Stuart Kaswell; Jerry Quinn; George Kramer
**Priority:** Normal
**Subject:** Fwd: breaking news on hedge funds

FYI

Forward Header

Subject: breaking news on hedge funds
Author: "Acworth; Will" <wacworth@bridge.com>
Date: 4/29/99 12:50 PM

-- [B] US study wants hedge funds to reveal more information --

--US study urges more regulation of broker-dealer affiliates
--US hedge fund study urges more public disclosure of leverage
--US study: "Potential" for direct hedge-fund regulation later
--US study says "market discipline breakdown" caused LTCM episode
--US seeks stronger supervision in off-shore financial centers
--US to propose regulations for derivatives dealers this summer

By Will Acworth, Bridge News
Washington--Apr 29--A high-level group of US financial regulators today issued a set of 8 recommendations to address the systemic risk problems exposed by the near-collapse of a large hedge fund last fall. The recommendations are mainly aimed at limiting the amount of leverage in the financial system by strengthening the forces of "market discipline." The recommendations include such steps as creating tougher reporting and disclosure requirements by hedge funds and their counterparties, encouraging better risk management practices in the private sector, and closing certain gaps in the US and international regulatory framework.

* * *

The study was developed by staff from the Treasury Department, the Federal Reserve, the Securities and Exchange Commission, the Commodity Futures Trading Commission, and several other banking regulatory agencies. The study is intended to encourage Congress to pass new laws to achieve some of the

recommendations,
but other recommendations are intended to be put into effect by
the
regulators.
    The study does not call for the direct regulation of hedge
funds,
instead
saying that this issue should be considered if the indirect
methods
recommended
in the study fail to sufficiently constrain the amount of
leverage in the
financial system.
    The study also asserts that the systemic risk problems
exposed last
fall,
when Long-Term Capital Management hedge fund nearly defaulted,
were caused
by a
"breakdown in market discipline," not by a lack of information
about LTCM's
investments, as some observers have said. The study also said
that although
LTCM
used an extraordinary amount of leverage, the leverage issue
was not unique
to
that fund or to hedge funds in general, but rather reflected a
problem that
could affect a wide range of financial institutions.
    A statement issued by the White House today said the hedge
fund study
was
"designed to reduce the potential risks of excessive leverage,"
as
demonstrated
by LTCM's near collapse.
    "By enhancing transparency in the financial system, by
increasing the
amount
of information made available to the public and by improving
risk management
on
the part of financial institutions, we can help reduce these
risks," the
statement said.

DISCLOSURE AND REPORTING
    This recommendation will help market participants "make
better
judgments"
about the creditworthiness of the hedge funds and other
institutions to whom
they provide credit or equity, the study said.
    First, Congress should pass laws requiring large hedge
funds that are
registered as commodity pool operators to issue quarterly
reports with the
CFTC,
rather than annual reports. Also, these reports could include

"more meaningful and comprehensive measures of market risk" without necessarily disclosing sensitive information about the hedge funds' trading strategies.

Congress should find a way to apply a similar public reporting requirement to hedge funds that are not CPOs, the study said. The study did not define what size funds should be covered by this reporting requirement, instead leaving that issue for Congress to decide.

Second, the study called on the SEC to issue rules requiring all public companies to report their exposures to any financial entities that have "significant" leverage. This report could be incorporated into the periodic financial statements that public companies must file with the SEC, such as the Form 10-K and Form 10-Q, the study said. The companies would not have to disclose specific positions, but rather exposures to individual or groups of firms that could have a "material" effect on the financial statements.

CAPITAL STANDARDS

The study called for several changes to international capital standards for the banking industry so that the standards are "aligned more closely" with the actual risks taken by financial institutions.

Specifically, it urged regulators to set the capital requirement for the credit and market risk exposures arising from derivatives so that they are similar to the capital treatment of risks arising from other types of financial instruments, such as loans or securities. This probably would force banks to set aside more capital for derivatives, Treasury officials conceded during a briefing for reporters.

The study also endorsed a project already under way at the Basle Committee on Banking Supervision to update its credit risk standards, and reiterated a warning from supervisors that banks and other financial

institutions should carefully validate the statistical models they use to analyze their market risks.

CLOSING REGULATORY GAPS

The study urged Congress to give more power to the SEC and the CFTC to regulate the affiliates of the broker-dealers and futures brokerage houses that fall within their jurisdictions.

This should be aimed at improving the 2 agencies' ability to assess risks by expanding their reporting, record-keeping and examination authority for these affiliates, the study said, so that the agencies would gain "a more comprehensive picture" of the potential risks such affiliates might pose to related firms and the financial system as a whole.

Although the study did not explicitly acknowledge any gaps in the current US regulatory structure, this recommendation was clearly aimed at firms like Goldman Sachs, Lehman Brothers and Morgan Stanley, which conduct most of their derivatives business in unregulated affiliates of their US broker-dealer subsidiaries.

The study specifically urged Congress to give the SEC and the CFTC the power to force the unregulated affiliates to periodically report credit risk information by counterparty, "non-aggregated position information," and information about the concentration of their exposures.

Treasury should also receive similar powers through the expansion of its authority over the government securities markets, the study said.

In a footnote, Fed Chairman Alan Greenspan said he "declines to endorse" this recommendation, "but in this instance defers to the judgment" of the other 3 agencies that comprise the President's Working Group on Financial Markets. This seemed to be the only instance when the report's recommendations were less than unanimous.

OFFSHORE FINANCIAL CENTERS

The study offered several recommendations to address the

potential that
hedge funds might dodge tougher regulations and tax laws in the
US by
relocating
to offshore financial centers such as the Cayman Islands. In
general, the
study
urged cooperation to encourage these centers to adopt
international
standards,
but it also offered several ideas for pressuring financial
institutions into
reducing their transactions with companies operating in
these offshore centers.
    For instance, the study urged banking regulators to require
more capital
on
transactions with these companies. It also urged Congress to
pass
legislation
ensuring that a hedge fund could not prevent collateral located
in the US
from
being sold by declaring bankruptcy offshore.

ADDITIONAL POTENTIAL STEPS
    The study offered several suggestions for further action if
the above
recommendations fail to achieve the desired limits on leverage.
These steps,
which the study emphasized are only "potential", included the
direct
regulation
of hedge funds, the consolidated supervision of broker-dealers
and their
unregulated affiliates, and the direct regulation of
derivatives dealers.
    Treasury officials said today that they expect to issue
another study
"later
this summer" dealing with derivatives issues, and said direct
regulation of
derivatives dealers would be handled in that report.  End
    Bridge News, Tel: (202) 662-7229
    Send comments to Internet address: econ@bridge.com

April 28, 1999

The Honorable J. Dennis Hastert
The Speaker
United States House of Representatives
Washington, D.C. 20515

Dear Mr. Speaker:

We are pleased to transmit the report of the President's Working Group on Financial Markets on Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management (LTCM).

The principal policy issue arising out of the events surrounding the near collapse of LTCM is how to constrain excessive leverage. By increasing the chance that problems at one financial institution could be transmitted to other institutions, excessive leverage can increase the likelihood of a general breakdown in the functioning of financial markets. This issue is not limited to hedge funds; other financial institutions are often larger and more highly leveraged than most hedge funds.

In view of our findings, the Working Group recommends a number of measures designed to constrain excessive leverage. These measures are designed to improve transparency in the system, enhance private sector risk management practices, develop more risk-sensitive approaches to capital adequacy, support financial contract netting in the event of bankruptcy, and encourage offshore financial centers to comply with international standards.

The LTCM incident highlights a number of tax issues with respect to hedge funds, including the tax treatment of total return equity swaps and the use of offshore financial centers. These issues, however, are beyond the scope of this report and are being addressed separately by Treasury.

A number of other federal agencies were full participants in this study and support its conclusions and recommendations: the Council of Economic Advisers, the Federal Deposit Insurance Corporation, the National Economic Council, the Federal Reserve Bank of New York, the Office of the Comptroller of the Currency, and the Office of Thrift Supervision. We are grateful for their extensive assistance.

We appreciate the opportunity to convey this report to you, and we look forward to continuing to work with you on these important issues.

Sincerely,

(signed)
Robert E. Rubin
Secretary
Department of the Treasury

(signed)
Alan Greenspan
Chairman
Board of Governors of the Federal Reserve

(signed)
Arthur Levitt
Chairman
Securities and Exchange Commission

(signed)
Brooksley Born
Chairperson
Commodity Futures Trading Commission

April 28, 1999

The Honorable Al Gore
President of the Senate
United States Senate
Washington, D.C. 20510

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## EXECUTIVE SUMMARY

The President's Working Group on Financial Markets recommends a number of measures designed to constrain excessive leverage in the financial system. The events in global financial markets in the summer and fall of 1998 demonstrated that excessive leverage can greatly magnify the negative effects of any event or series of events on the financial system as a whole. The near collapse of Long-Term Capital Management ("LTCM"), a private sector investment firm, highlighted the possibility that problems at one financial institution could be transmitted to other institutions, and potentially pose risks to the financial system.

Although LTCM is a hedge fund, this issue is not limited to hedge funds. Other financial institutions, including some banks and securities firms, are larger, and generally more highly leveraged, than hedge funds.

While leverage can play a positive role in our financial system, problems can arise when financial institutions go too far in extending credit to their customers and counterparties. The near collapse of LTCM illustrates the need for all participants in our financial system, not only hedge funds, to face constraints on the amount of leverage they assume.

Our market-based economy relies primarily on market discipline to constrain leverage. But market discipline can break down In the case of LTCM, its investors, creditors, and counterparties did not provide an effective check on its overall activities. Moreover, some of the same market and credit risk management weaknesses that permitted LTCM to achieve its extraordinary leverage were evident in other market participants. In the immediate aftermath of LTCM's near collapse, credit risk management practices vis-a-vis highly leveraged institutions were tightened. But market history indicates that even painful lessons recede from memory with time.

Therefore, the Working Group recommends the following measures:

- More frequent and meaningful information on hedge funds should be made public.
- Public companies, including financial institutions, should publicly disclose additional information about their material financial exposures to significantly leveraged institutions, including hedge funds.
- Financial institutions should enhance their practices for counterparty risk management.
- Regulators should encourage improvements in the risk-management systems of regulated entities.

- Regulators should promote the development of more risk-sensitive but prudent approaches to capital adequacy.

- Regulators need expanded risk assessment authority for the unregulated affiliates of broker-dealers and futures commission merchants.*

- The Congress should enact the provisions proposed by the President's Working Group to support financial contract netting.

- Regulators should consider stronger incentives to encourage offshore financial centers to comply with international standards.

The Working Group will be monitoring and assessing the effectiveness of the measures outlined above. If further evidence emerges that indirect regulation of currently unregulated market participants is not effective in constraining excessive leverage, there are several matters that could be given further consideration; however, the Working Group is not recommending any of them at this time.

Concerns have been expressed about the activities of highly leveraged institutions with respect to their impact on market dynamics generally and vulnerable economies in particular. Such activity can affect markets in some circumstances and for limited periods although, as a number of independent studies that have been undertaken so far have suggested, the activities of highly leveraged institutions do not appear to have played a significant role in precipitating the financial market crises of the past few years. Further study of this issue will be undertaken by the Financial Stability Forum, recently established by the G-7.

This report includes a Background section that provides a description of hedge funds, their activities and their counterparties, and also describes the events surrounding the near collapse of LTCM. The second section, on Public Policy Issues, discusses a number of questions raised by LTCM In the Conclusions and Recommendations section we fully discuss the recommendations summarized above. This report also includes a number of appendices that address some key topics in more detail.

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* Please see footnote 23 on page 39.

# Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management

## Report of The President's Working Group on Financial Markets

## I. BACKGROUND

### HEDGE FUNDS [1]

### A. General Description

The term "hedge fund" is commonly used to describe a variety of different types of investment vehicles that share some similar characteristics. Although it is not statutorily defined, the term encompasses any pooled investment vehicle that is privately organized, administered by professional investment managers, and not widely available to the public. The primary investors in hedge funds are wealthy individuals and institutional investors. In addition, hedge fund managers frequently have a stake in the funds they manage. Entities classified as hedge funds are commonly organized as limited partnerships or limited liability companies, and in many cases are domiciled outside the United States.

Hedge funds are not a recent invention, as the founding of the first hedge fund is conventionally dated to 1949.[2] A 1968 survey by the Securities and Exchange Commission ("SEC") identified 140 funds operating at that time. During the last two decades, however, the hedge fund industry has grown substantially. Although it is difficult to estimate precisely the size of the industry, a number of estimates indicate that as of mid-1998 there were between 2,500 and 3,500 hedge funds managing between $200 billion and $300 billion in capital, with approximately $800 billion to $1 trillion in total assets. Collectively, hedge funds remain relatively small when compared to other sectors of the U.S. financial markets. At the end of 1998, for instance, commercial banks had $4.1 trillion in total assets; mutual funds had assets of approximately $5

[1] This section provides a summary of the key background information on hedge funds. Additional information about hedge funds is presented in Appendix A of this report.

[2] For a detailed history of hedge funds, see Ted Caldwell, "Introduction: The Model for Superior Performance," in *Hedge Funds: Investment and Portfolio Strategies for the Institutional Investor*, eds. Jess Lederman and Robert A. Klein (New York: Irwin Professional Publishing, 1995), pp. 1-17.

trillion; private pension funds had $4.3 trillion; state and local retirement funds had $2.3 trillion; and insurance companies had assets of $3.7 trillion.[3]

With $200 - $300 billion spread among approximately 3,000 hedge funds, most hedge funds are relatively small, with the vast majority controlling less than $100 million in invested capital. In fact, according to commodity pool operator ("CPO") filings with the CFTC, there are perhaps only a few dozen hedge funds today that have a capital base larger than $1 billion, and only a small handful that exceed $5 billion.[4] The very largest hedge funds have less than $12 billion in investor capital, although some "families" of funds have greater stakes. Although individually and as an industry, hedge funds represent a relatively small segment of the market, their impact is greatly magnified by their highly active trading strategies and by the leverage obtained through their use of repurchase agreements and derivative contracts.

Apart from size, hedge funds differ in other important ways from alternative types of investment vehicles. Hedge funds are able to sell securities short and to buy securities on leverage. While this activity is not unique to hedge funds, hedge funds often use leverage aggressively. Hedge funds also charge advisory fees based on performance, and they tend to pursue short-term investment strategies.

In general, active market participants such as hedge funds can provide benefits to financial markets by enhancing liquidity and efficiency. Additionally, they can play a role in financial innovation and the reallocation of financial risk. However, some hedge funds, like other large highly leveraged financial institutions, also have the potential to disrupt the functioning of financial markets. Indeed, some observers have asserted that hedge funds are responsible for large and sometimes disruptive market movements in vulnerable economies. According to several comprehensive analyses of the issue, however, hedge funds do not appear to have played a significant role in precipitating the financial market crises of the past few years.[5] Further study of this issue will be undertaken by the Financial Stability Forum, recently established by the G-7.

There is no single market strategy or approach pursued by hedge funds as a group. Rather, hedge funds exhibit a wide variety of investment styles, some of which use highly

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[3] Source: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts of the United States*, Fourth Quarter 1998.

[4] The CFTC has limited regulatory authority over CPOs, including those CPOs that operate hedge funds, that either transact business on U.S. futures exchanges or that have U.S. investors and transact business on U.S. or foreign futures exchanges. It should be further noted that not all hedge funds are operated by persons required to register as CPOs. For more information on CPOs, see Appendix C.

[5] See Barry Eichengreen et al., *Hedge Funds and Financial Market Dynamics*, Occasional Paper No. 166 (Washington D.C.: International Monetary Fund, 1998); and Stephen J. Brown, William N. Goetzmann, and James M. Park, *Hedge Funds and the Asian Currency Crisis of 1997*, NBER Working Paper No. 6427 (February 1998).

quantitative techniques while others employ more subjective factors. Researchers and other industry observers therefore often classify hedge funds according to the main investment strategy practiced by the funds' management. Global-macro funds, for instance, take positions based on their forecasts of global macroeconomic developments, while event-driven funds invest in specific securities related to such events as bankruptcies, reorganizations, and mergers. A relatively small set of market-neutral hedge funds employ relative-value strategies seeking to profit by taking offsetting positions in two assets whose price relationships are expected to move in a direction favorable to these offsetting positions.

Hedge funds are also diverse in their use of different types of financial instruments. Many hedge funds trade equity or fixed income securities, taking either long or short positions, or sometimes both simultaneously. A large number of funds also use exchange-traded futures contracts or over-the-counter ("OTC") derivatives, to hedge their portfolios, to exploit market inefficiencies, or to take outright positions. Still others are active participants in foreign exchange markets. In general, hedge funds are more active users of derivatives and of short positions than are mutual funds or many other classes of asset managers. In this respect, the trading activities of hedge funds are similar to those undertaken by the proprietary trading areas of large commercial and investment banks.

Hedge funds that conform to certain requirements are eligible for various exemptions from federal securities laws. In particular, unlike mutual funds, hedge funds are exempt from SEC reporting requirements, as well as from regulatory restrictions on leverage or trading strategies. They also face fewer limitations on the structure and size of fees they may charge. The sponsors of hedge funds that trade on organized futures exchanges and that have U.S. investors, however, are typically required to register with the CFTC as a CPO. Registered CPOs are subject to periodic reporting, recordkeeping, and disclosure requirements.

To avoid the registration and reporting requirements of the federal securities laws, hedge funds generally do not raise funds via public offerings of their securities, advertise broadly, or engage in general solicitation. Hedge funds also typically have either no more than 100 beneficial owners or require their investors to meet rigid minimum size requirements.[6]

Recent studies of hedge fund performance have generally found that hedge funds as a group offer greater return, yet greater risk, than investment benchmarks such as Standard and Poor's S&P 500 stock index.[7] Not surprisingly, particular classes of hedge funds have at times

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[6] Sections 3(c)(1) — limiting beneficial ownership to 100 persons — and 3(c)(7) — limiting investment to "qualified purchasers" — of the Investment Company Act of 1940. For a detailed discussion of these provisions, see Appendix B of this report.

[7] See, for example, William Fung and David Hsieh, "Empirical Characteristics of Dynamic Trading Strategies: The Case of Hedge Funds," *Review of Financial Studies* 10:2 (Summer 1997) pp. 275 - 302; and Stephen J. Brown, William N. Goetzmann, and Roger G. Ibbotson, "Off-Shore Hedge Funds: Survival and Performance 1989 - 1995," *Journal of Business* 72:1 (January 1999) pp. 91-117

outperformed benchmark measures on a risk-adjusted basis, while other classes have at times underperformed. Importantly, the performance of many hedge funds historically has not been highly correlated with overall market performance, thus accounting for their inclusion in the portfolios of wealthy individuals and institutional investors who seek a broad diversification of their investments.

## B. Trading Practices

Hedge funds are only one example of a collection of institutions that actively trade securities and derivative instruments. An assessment of the public policy issues posed by hedge funds might therefore benefit from a consideration of hedge funds in the broader context of trading activity. In today's economy, the markets for traded securities are performing an increasingly important role in the intermediation of credit. Among the wide range of institutions participating in this trading activity are hedge funds, trading desks of banks, securities firms and insurance companies, mutual funds, and other managed funds. Some of these institutions engage in trading activity more intensively than others.

The diverse collection of institutions, including hedge funds, that engage in trading activity can be characterized by similarities in their use of mark-to-market discipline, leverage, and active trading.

### Mark-to-market

Mark-to-market practices, the discipline of periodically valuing positions at current market prices, may be imposed through external accounting or regulatory requirements, or through internal risk management practices. In addition, mark-to-market practices may be imposed through counterparties' valuation of trading exposures and collateral. This discipline is useful for preventing the concealment of losses and for encouraging the timely resolution of problems. While they may not necessarily be required to do so, hedge funds generally practice this discipline.

The use of mark-to-market valuation for managing collateral and variation margin to mitigate credit risk can impose cash flow and liquidity strains on a trading entity. Such liquidity and cash flow problems can be particularly severe for a highly leveraged trading vehicle, especially during episodes of extreme price volatility when mark-to-market driven collateral and margin calls can impose a very short time frame for resolving liquidity problems.

### Leverage

Leverage allows hedge funds to magnify their exposures and, as a direct consequence, magnify their risks. The term leverage can be defined in balance-sheet terms, in which case it refers to the ratio of assets to net worth. Alternatively, leverage can be defined in terms of risk, in which case it is a measure of economic risk relative to capital. Hedge funds obtain economic leverage in various ways, such as through the use of repurchase agreements, short positions, and

derivative contracts. At times, the choice of investment is influenced by the availability of leverage. Beyond a trading institution's risk appetite, both balance-sheet and economic leverage may be constrained in some cases by initial margin and collateral at the transaction level, and also by trading and credit limits imposed by trading counterparties. For some types of financial institutions, regulatory capital requirements may constrain leverage, although this limitation does not apply to hedge funds. Hedge funds are limited in their use of leverage only by the willingness of their creditors and counterparties to provide such leverage.

Hedge funds vary greatly in their use of leverage. Nevertheless, compared with other trading institutions, hedge funds' use of leverage, combined with any structured or illiquid positions whose full value cannot be realized in a quick sale, can potentially make them somewhat fragile institutions that are vulnerable to liquidity shocks. While trading desks of banks and securities firms may take positions similar to hedge funds' investments, these organizations and their parent firms often have both liquidity sources and independent streams of income from other activities that can offset the riskiness of their positions.

Like banks and securities firms, but unlike most mutual funds, hedge funds lever their capital bases to increase their total asset holdings by a multiple of the amount of capital invested in the funds. CPO reports, however, suggest that the significant majority of reporting hedge funds have balance-sheet leverage ratios (total assets to capital) of less than 2-to-1. There are, of course, important exceptions. According to September 1998 CPO filings, at least ten hedge funds with capital exceeding $100 million leveraged their capital more than ten times. At the extreme, the most leveraged hedge funds in this group levered their capital more than thirty times

**Active trading**

Active trading, which is typical of hedge funds, is a practice in which investment positions are changed with high frequency. Such trading may be conducted to maintain a desired risk-return profile as market prices fluctuate, or it may be conducted to attempt to profit from short-term changes in prices. While turnover in hedge funds' portfolios differs widely, the typical hedge fund's use of active trading strategies is closer to that of financial intermediaries' proprietary trading desks than to a mutual fund or pension fund.

Active trading strategies rely on market liquidity and access to credit to meet funding needs. However, an entity's ability to trade actively can diminish either because creditworthiness concerns cause counterparties to cut trading and credit limits or because of a broader disappearance of market liquidity. The inability to execute active trading strategies can lead to unexpectedly large mark-to-market losses as positions that had been thought of as modifiable exposures become longer-term positions.

## C. Disclosure and Monitoring

A trading entity is often subject to disclosure and monitoring of its financial condition, and these requirements can serve to limit the trader's activities. Trading desks of a few major banks and securities firms are constrained by internal risk management functions, by risk-based capital requirements,[8] and by public disclosure of the firms' overall trading activity.[9] No such limitations apply, however, to hedge funds. In fact, hedge funds are subject to fewer public disclosure requirements and less monitoring than many other financial institutions.

Disclosures by hedge funds to counterparties and investors are often made using accounting and balance-sheet concepts. While such information includes notional amount and market value of derivatives contracts, the typical accounting statement is still not informative about the risk profile of trading activity (*e.g.*, the nature of the exposures to market risk and credit risk).

## D. Counterparty and Credit Relationships

In order for hedge funds to conduct their active trading and to employ leverage, it is necessary for them to enter into business relationships with other entities. This section describes the nature of these relationships.

### Credit exposures

Credit exposures between hedge funds and their counterparties arise primarily from trading and lending relationships, such as through derivatives and repurchase agreement ("repo") transactions.[10] These exposures, which are often reciprocal, are created when changes in market prices cause the replacement values of transactions to rise above their value at inception. Thus, a default of either the hedge fund or the counterparty would cause a loss to the other party because the transactions can only be replaced at the market prices prevailing after default.

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[8] Banks' trading activity is subject to risk-based regulatory capital requirements. Securities firms are also subject to regulatory capital requirements.

[9] For example, some banks disclose both the prospective and retrospective volatility of their trading revenues in the form of both value-at risk ("VaR") and the realized variability of trading revenues.

[10] A repurchase agreement ("repo") is the sale of a security, often – though not always – a U.S. government obligation or other highly liquid instrument, at a specified price coupled with a simultaneous agreement to buy back the security on a specified future date, usually at a fixed or determinable price. A reverse repurchase agreement is the purchase of a security with an agreement to sell it back. Thus, from the perspective of one party these coupled transactions constitute a repo and to the other party, a reverse repo. Interest normally flows to the provider of funds (the party doing the reverse repo) from the provider of securities (the party doing the repo).

The credit exposure of a typical transaction has two components, the current credit exposure and the potential future exposure. The current credit exposure at a moment in time is the market value of the contract, and represents the replacement cost of the contract if one party to the transaction defaults at that moment. The potential future exposure is an estimate of the possible increase in the contract's replacement value from the point of view of a particular firm over a specified interval in the future, such as between the time of a potential default and the time the counterparty is able to replace the contract.

In addition to the credit exposures stemming from trading relationships, further credit exposure may be realized by counterparties when they extend credit to hedge funds through credit lines. Hedge funds can face considerable liquidity risk through mismatched cash flows of assets and liabilities. Revolving lines of credit and broker loans are sometimes used to bridge these mismatches. However, these credit lines often entail high costs, and thus are not typically used for establishing leverage. Hedge funds can achieve economic leverage in their positions more cheaply in other ways, such as through repo and derivatives transactions.

Counterparties manage these exposures through a variety of safeguards including due diligence, disclosure, collateral practices, credit limits, and monitoring.

**Due diligence and documentation**

Due diligence reviews by extenders of credit to hedge fund customers typically include assessments of: offering circulars or private placement memorandums; partnership agreements, performance history; investment authority, management ability and reputation; capital, including size, growth, investor concentration, and management share of the capital base; risk profile implications of the fund's investment and trading styles; liquidity, including types of positions and investor withdrawal rules; leverage, including on- and off-balance-sheet leverage, and fit with liquidity of positions; risk management; and front and back office operations.

In addition to such reviews, maintaining up-to-date documentation of all outstanding contracts is an important component of credit-risk management. Generally, signed master agreements are required prior to initiation of transactions. In cases where a continuing business relationship has not been established and master agreements have not been signed, "full" confirmations containing many of the provisions found in a master agreement are used. Master agreements usually include standard ISDA (International Swaps and Derivatives Association) and IFEMA (International Foreign Exchange Master Agreement) default clauses, supplemented with additional termination events covering the dissolution or liquidation of the fund, the resignation of the fund's general partner or principals, or decreases in net asset values beyond a certain threshold.

**Information provided to counterparties**

Banks and securities firms typically impose on-going financial reporting requirements on their hedge fund customers as part of their credit-risk assessment and risk-management process. Such reporting usually includes audited annual financial statements, quarterly financial statements, and monthly net asset value statements.

The variability of a hedge fund's financial position and risk profile, however, makes traditional tools of financial statement analysis less effective in assessing the credit exposure to a hedge fund. As noted in a 1994 Bank for International Settlements ("BIS") report on public disclosure of risks arising from trading activity, traditional accounting-based information is not alone sufficient to describe the risks associated with trading activity.[11] That report emphasized the importance of information about the volatility of trading portfolio values, both retrospectively and prospectively, for assessing a counterparty's creditworthiness. While such information is produced by most risk-management information systems, the degree to which that information is drawn upon in reports to trading counterparties still varies widely.

Given the limitations of the typical financial statement for timely assessment of a hedge fund's trading risks, banks and securities firms supplement traditional financial analysis with occasional on-site visits and qualitative evaluations of the fund's risk management practices, trading strategies, and performance. Such qualitative evaluations, however, may not eliminate counterparties' need for better quantitative information.

**Collateral practices**

Because of the difficulties of assessing the creditworthiness of hedge funds, counterparties typically use collateral as a risk mitigation device. Generally, unsecured credit extension occurs only if sufficient information is available to assure the creditor that the borrower's credit risk is low. In practice, the degree of collateralization tends to vary with the creditworthiness of the borrower. For higher-risk counterparties, or counterparties for which credit related information is unavailable or too costly to acquire, credit exposures are more likely to be collateralized. A trading counterparty may be asked to post collateral if the current credit exposure rises, or if the creditworthiness of the counterparty deteriorates. In addition, collateral may be required to cover the potential future exposure either at inception or upon subsequent periodic review.

While collateral can mitigate credit risk in trading relationships, it does not eliminate it. For example, the liquidity support provided to a hedge fund may be withdrawn during periods of stress when it is most needed. This vulnerability of the fund, in turn, can affect other hedge fund counterparties, especially those that use collateral to control credit risk. In other words, the requirement to cover the mark-to-market exposure with collateral can foster a false sense of

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[11] Bank for International Settlements, *Public Disclosure of Market and Credit Risks by Financial Intermediaries*, September 1994.

security because a hedge fund's ability to post collateral may evaporate, leaving the counterparty that relies on collateral with the unsatisfactory prospect of liquidating positions in a declining market. Thus, counterparties typically use collateral in conjunction with other methods of credit exposure management.

While collateral is now used to a greater degree than in the past, before last fall, greater competition for hedge fund business by banks and securities firms appeared to have loosened collateral terms and conditions. In many cases, banks and securities firms did not require collateral for potential future exposure. In addition, one-way collateral agreements in which the hedge fund was required to post collateral to the dealer, but not vice versa, gave way to reciprocal collateral agreements where either party could be required to post collateral, depending on the direction of the credit exposure. Such arrangements were typical only for the more established market participants.

More recently, because of the information problems associated with hedge funds and the volatility of hedge fund net asset values, banks and securities firms now usually require collateral on their exposures to hedge fund customers. Generally, collateral is required to cover the current credit exposure or current replacement value. Even though the option to make daily collateral calls exists, to reduce the need for frequent small transfers of collateral, some business is conducted on a loss-threshold basis under which additional collateral is not required until a certain replacement value amount is exceeded. The current exposure thresholds that trigger collateral calls are usually small, however, and current replacement values are generally well collateralized.

**Credit limits**

Credit limits on counterparty exposures are an important credit-risk management tool that serve to control credit-risk exposures through diversification. Like other sources of credit risk for banks and securities firms, credit exposures to hedge funds arising from both trading activities and direct lending are subject to credit limits. Credit limits may take the form of an overall limit across all product and business lines, and sub-limits may be applied at the level of individual products. Limits may also be applied at the industry level — for instance, to hedge funds as a group

The size of a credit limit imposed by a creditor is based upon the counterparty's creditworthiness, and limits are applied to hedge funds as determined by an assessment of their relative returns and risks. The adequacy of spreads relative to the risks involved, compared to other business opportunities, plays a role in the dialogue between business units and the risk-management function in the setting of credit and trading limits.

The nature of the credit exposure, such as the maturity, or whether secured or unsecured, is also a factor in determining the size of a credit limit. In addition, when netting arrangements are enforceable, a credit limit may be applied to the net exposure as well as the gross amount The metric in which the exposure is measured can be a nominal amount, the current market value,

or a measure of potential exposure. Depending on the products comprising the exposure, the limit may be applied to a combination of all three measures.

### Monitoring

Monitoring of credit exposures is an important part of credit-risk management. This monitoring may cover both an on-going assessment of the counterparty's financial condition as well as monitoring the status of the current exposure. The monitoring systems include on-going financial reporting requirements, as well as daily mark-to-market valuation of exposures.

The daily monitoring of exposures and the active management of exposure and collateral levels can help control the credit risk in a trading relationship. For example, some warning of problems may be inferred if a customer's ability to post collateral becomes irregular. Such procedures may identify potential problems, allowing timely adjustment of trading and credit limits, or in an extreme case, a more orderly unwinding of positions.

For the assessment of changes in the financial condition of a counterparty, monitoring of exposures provides only a partial view of a hedge fund's condition because a dealer's own transactions with the hedge fund might not reveal the fund's overall risk profile.

## THE LTCM EPISODE

### A. Background

Long-Term Capital Management, L.P. ("LTCM") was founded in early 1994. Although LTCM itself is a Delaware limited partnership with its main offices in Connecticut, the fund that it operates, Long-Term Capital Portfolio, L.P., ("the LTCM Fund," or "the Fund") is a Cayman Islands partnership.[12] LTCM sought to profit from a variety of trading strategies, including convergence trades[13] and dynamic hedging.[14] LTCM's principals included individuals with substantial reputations in the financial markets and especially in the economic theory of financial markets. From its inception, LTCM had a prominent position in the community of hedge funds, both because of the reputation of its principals, and also because of its large initial capital stake

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[12] The LTCM Fund was the investment vehicle for a number of feeder funds, which were structured to meet the tax, regulatory, or accounting concerns of different classes of investors from different countries.

[13] Convergence trading (also sometimes known as relative value arbitrage) refers to the practice of taking offsetting positions in two related securities in the hopes that the price gap between the two securities will move in a favorable direction. In some cases, there is an underlying reason why the favorable relative price changes are thought to be inevitable, while in others the trade is more purely speculative.

[14] Dynamic hedging refers to the practice of managing nonlinear price risk exposure (*i.e.*, from options) through active rebalancing of underlying positions, rather than by arranging offsetting hedges directly.

The LTCM Fund produced returns, net of fees, of approximately 40 percent in 1995 and 1996, and slightly less than 20 percent in 1997. At the end of 1997, LTCM returned approximately $2.7 billion in capital to its investors, reducing the capital base of the fund by about 36 percent to $4.8 billion. Despite this reduction in its capital base, however, the hedge fund apparently did not reduce the scale of its investment positions. Put another way, the managers of the Fund decided to increase its balance-sheet leverage by reducing its capital base rather than by increasing its positions.

Approximately 80 percent of the LTCM Fund's balance-sheet positions were in government bonds of the G-7 countries (*viz.*, the United States, Canada, France, Germany, Italy, Japan, and the United Kingdom). Nevertheless, the Fund was active in many other markets, including securities markets, exchange-traded futures, and OTC derivatives. Its activity was also geographically diverse, encompassing markets in North America, Europe, and Asia. Specifically:

- The LTCM Fund participated in government bond markets, mortgage-backed securities markets, corporate bond markets, emerging bond markets, and equity markets. The LTCM Fund held long and short positions in these markets, and supported these positions in many cases through repo and reverse repo agreements and securities lending agreements with a large number of other market participants.

- The LTCM Fund took on futures positions at about a dozen major futures exchanges worldwide, including some very sizable positions. These were primarily concentrated in two areas — interest rate (including bond) futures and equity index futures.

- The LTCM Fund engaged in OTC derivatives contracts with several dozen counterparties. These positions included swap, forward, and option contracts, and were predominantly focused on interest rates and equity markets.

- The LTCM Fund participated in the foreign exchange markets to support its activities in multiple national markets. Although the Fund sometimes held open foreign exchange positions, it was not substantially engaged in efforts to profit from foreign exchange fluctuations.

- The LTCM Fund's involvement in the markets for physical commodities, if any, was negligible.

Overall, the distinguishing features of the LTCM Fund were the scale of its activities, the large size of its positions in certain markets, and the extent of its leverage, both in terms of balance-sheet measures and on the basis of more meaningful measures of risk exposure in relation to capital. The Fund reportedly had over 60,000 trades on its books, including long securities positions of over $50 billion and short positions of an equivalent magnitude. At the end of August, 1998, the gross notional amounts of the Fund's contracts on futures exchanges exceeded

$500 billion, swaps contracts more than $750 billion, and options and other OTC derivatives over $150 billion.

Moreover, the Fund held large relative positions in several markets, such as in U.S. and foreign futures exchanges. For example, a number of the Fund's futures positions represented more than five percent of open interest, and in a few cases, well above ten percent. Relative to daily turnover in those markets, the scale of the fund's positions were even larger. In addition, the LTCM Fund also held very significant positions in specific securities.

With regard to leverage, the LTCM Fund's balance sheet on August 31, 1998, included over $125 billion in assets. Even using the January 1, 1998, equity capital figure of $4.8 billion, this level of assets still implies a balance-sheet leverage ratio of more than 25-to-1. The extent of this leverage implies a great deal of risk. Although exact comparisons are difficult, it is likely that the LTCM Fund's exposure to certain market risks was several times greater than that of the trading portfolios typically held by major dealer firms.

The LTCM Fund's size and leverage, as well as the trading strategies that it utilized, made it vulnerable to the extraordinary financial market conditions that emerged following Russia's devaluation of the ruble and declaration of a debt moratorium on August 17 of last year. Russia's actions sparked a "flight to quality" in which investors avoided risk and sought out liquidity. As a result, risk spreads and liquidity premiums rose sharply in markets around the world. The size, persistence, and pervasiveness of the widening of risk spreads confounded the risk management models employed by LTCM and other participants. Both LTCM and other market participants suffered losses in individual markets that greatly exceeded what conventional risk models, estimated during more stable periods, suggested were probable. Moreover, the simultaneous shocks to many markets confounded expectations of relatively low correlations between market prices and revealed that global trading portfolios like LTCM's were less well diversified than assumed. Finally, the "flight to quality" resulted in a substantial reduction in the liquidity of many markets, which, contrary to the assumptions implicit in their models, made it difficult to reduce exposures quickly without incurring further losses.

**B. LTCM's Near Failure**

On July 31, 1998, the LTCM Fund held $4.1 billion in capital, down about fifteen percent from the beginning of the year. During the single month of August, the LTCM Fund suffered additional losses of $1.8 billion, bringing the loss of equity for the year to over fifty percent The Fund's capital base was now $2.3 billion, and LTCM reported to investors that it was seeking an injection of capital.

During the first two weeks of September 1998, concern about LTCM was a major topic of conversation in the financial markets. The LTCM Fund suffered substantial further losses and found it difficult to reduce its positions because of the large size of those positions. In addition, as its condition deteriorated, previously flexible credit arrangements became more rigid and the

daily mark-to-market valuations for collateral calls by counterparties became more contentious. These factors added to the liquidity pressures facing LTCM.

By Friday, September 18, these liquidity pressures, together with continuing declines in the Fund's capital, were causing serious concerns among the Fund's principals about the ability of the Fund to continue meeting its cash flow obligations in the event of further shocks to its market value. As LTCM's efforts to raise new capital remained unsuccessful, its condition was also a source of major concern to numerous market participants. These market participants were concerned about the possibility that LTCM could abruptly collapse in the very near term and about the consequences that such a collapse might have on what already were extremely fragile world markets.

By September 21, the LTCM Fund's liquidity situation was bleak. Bear Stearns, LTCM's prime brokerage firm, had required LTCM to collateralize potential settlement exposures, reducing the fund's overall liquidity resources. LTCM's repo and OTC derivatives counterparties were seeking as much collateral as possible through the daily margining process, in many cases by seeking to apply possible liquidation values to mark-to-market valuations. The cash-flow strains were raising the risk that the LTCM Fund would be unable to meet payments due at the end of September. Moreover, in the absence of additional injections of liquidity, further unfavorable market movements could have led to a default as soon as Wednesday, September 23. Thus, a very short period of time remained for the participants to explore resolution alternatives. While LTCM's plight had been known to some market participants to varying degrees, no one had as yet stepped forward to offer an alternative that would avoid a default.

The primary trading counterparties and creditors to the LTCM Fund were themselves the firms most exposed in a default scenario. These firms had played an important role in allowing LTCM to build up such large positions. The self-interest of these firms was to find an alternative resolution that cost less than they could expect to lose in the event of default.

On Tuesday, September 22, a Core Group of four of the most concerned counterparties began seriously exploring the possibility of mutually beneficial alternatives to default. The main alternative the Core Group focused on came to be known as the consortium approach and involved the recapitalization of the LTCM Fund through mutual investments by its major counterparties in a recently set up feeder fund and a relatively small investment in a newly set up limited liability company which became a new general partner of the LTCM Fund. Under this approach, the stake of the original owners would be written down to 10 percent and the consortium would acquire the remaining 90 percent ownership share, as well as operational control of LTCM.

Following lengthy discussions in the afternoon and evening of September 23, fourteen firms agreed to participate in the consortium. The Federal Reserve Bank of New York provided the facilities for these discussions and encouraged the firms involved to seek the least disruptive solution that they believed was in their own collective self-interest. The agreement was reached

only after the firms involved became convinced that no other alternative to default was possible. The agreement followed the unraveling of a last minute alternative resolution which was presented to LTCM late in the morning of September 23. Another investor group had offered to purchase LTCM's portfolio, and at that time, all discussions related to the consortium approach were suspended. The consortium discussions reconvened only after it became clear that this alternative would not take place.[15]

The firms participating in the consortium invested about $3.6 billion in new equity in the fund, and in return received a 90 percent equity stake in LTCM's portfolio along with operational control. The responsibility and burden of resolving LTCM's difficulties remained with the counterparties that had allowed the hedge fund to build up its positions in the first place. The principals and investors in LTCM suffered very substantial losses on their equity stakes in the fund when their claim was reduced to ten percent.

### C. The LTCM Fund Achieved Extraordinary Levels of Leverage and Risk

Assessed against the trading practices of hedge funds and other trading institutions discussed above -- namely, mark-to-market, leverage, and active trading — and disclosure and monitoring requirements, the LTCM Fund stood out with respect to its opaqueness and low degree of external monitoring, and its high degree of leverage. At the time of its near-failure, the LTCM Fund was the most highly leveraged large hedge fund reporting to the CFTC. The combination of LTCM Fund's large capital base and high degree of leverage allowed it to hold more than $125 billion in total assets, nearly four times the assets of the next largest hedge fund. LTCM then faced severe market liquidity problems when its investments began losing value and the fund attempted to unwind some of its positions. The liquidity problems faced by LTCM were compounded by the large size of its positions in certain markets.

Although its mark-to-market valuations called LTCM's managers' attention to the Fund's problems well before the Fund's net worth was exhausted, individual counterparties — partly because there were so many — were not necessarily aware of the depth of LTCM's liquidity problems. Neither were the balance sheet and income statements that LTCM provided to its counterparties very informative about the Fund's risk profile and concentration of exposures in certain markets. This opaqueness of LTCM's risk profile is an important part of the LTCM story and raises a number of concerns regarding credit-risk management and counterparty trading relationships.

First, the LTCM Fund was able to acquire positions that proved large enough to strain its ability to manage the resulting market and liquidity risks. An issue here is whether the LTCM Fund's investors and counterparties were aware of the nature of the exposures and risks the hedge

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[15] This alternative offer is described more fully by William J. McDonough, President of the Federal Reserve Bank of New York, in his statement and subsequent testimony before the House Committee on Banking and Financial Services, during its October 1, 1998, hearing on hedge fund operations.

fund had accumulated, such as the Fund's exposure to market liquidity and funding liquidity risks. They almost certainly were not adequately aware since, by most accounts, they exercised minimal scrutiny of the Fund's risk-management practices and risk profile.

This insufficient monitoring arose, in part, because of LTCM's practice of disclosing only minimal information to these parties, information such as balance sheet and income statements that did not reveal meaningful details about the Fund's risk profile and concentration of exposures in certain markets. In LTCM's case, this minimal level of disclosure was tolerated because of the stature of its principals, its impressive track record, and the opportunity for the Fund's investors and counterparties to profit from a significant relationship with LTCM. LTCM's willingness to bear risk also made it an attractive counterparty for those firms seeking to hedge their own exposures. Thus, the main limitation on the LTCM Fund's overall scale and leverage was that provided by its managers and principals.

A related concern is whether the LTCM Fund's counterparties were lulled into a false sense of security based solely upon their collateral arrangements with the Fund. Counterparties' current credit exposures were in most cases covered by collateral. However, their potential future exposures were likely not adequately assessed, priced, or collateralized relative to the potential price shocks the markets were facing at the end of September 1998, and relative to the creditworthiness of the LTCM Fund at that time. Further, expectations about the ability to collect on collateral calls were probably unrealistic for an entity like the LTCM Fund, particularly in the market environment of last Fall. Thus, counterparties that were relying on variation margin to manage credit risk were left with the unsatisfactory prospect of liquidating collateral and closing out exposures in a declining market.

A further issue concerns the degree to which the management of credit risk in trading relationships should take account of the link between market risk, liquidity risk, and credit risk. The fall-out from recent market shocks shows the need to go beyond value-at-risk and potential future exposure models built only on very recent price data that may underestimate both the size of potential shocks to risk factors and their correlation. It appears that some of the risk models used by LTCM *and* its creditors and counterparties were flawed

While nearly all major trading firms make use of risk-measurement models to estimate the amount of risk being assumed, the decision about how much estimated risk can be safely borne for each dollar of capital is one that depends ultimately on the judgment of the firm's managers. Although it is not known how large a margin of error LTCM's principals allowed for in their estimates of the risks they were assuming, it is clear that LTCM's models underestimated the risk they were taking and the effect of their own positions in markets. Prior to this episode, LTCM maintained that the LTCM Fund's positions embodied risk similar to that of investing in the S&P 500 index on an unleveraged basis but were essentially uncorrelated with equity returns. LTCM's creditors and counterparties may have accepted this contention or had risk models which produced similar results.

Although individual counterparties imposed bilateral trading limits on their own activities with LTCM, none of its investors, creditors, or counterparties provided an effective check on its overall activities. Thus, the only limitation on the LTCM Fund's overall scale and leverage was that provided by its managers/principals. From their perspective, the desire to maximize returns (and management fees) on each dollar of invested capital naturally created an incentive to increase leverage. In this setting, the principals, making use of internal risk models, determined the frontier for safe operation of the fund.

A point whose significance was apparently missed by LTCM and its counterparties and creditors was that, while LTCM was diversified across global markets, it was not very well diversified as to strategy. It was betting in general that liquidity, credit and volatility spreads would narrow from historically high levels. When the spreads widened instead in markets across the world, LTCM found itself at the brink of insolvency. In retrospect, it can be seen that LTCM and others underestimated the likelihood that liquidity, credit and volatility spreads would move in a similar fashion in markets across the world at the same time.

Moreover, not only did liquidity, credit and volatility spreads widen, but the liquidity of many markets dried up. This compounded the problem faced by LTCM's creditors, because a liquidation of LTCM's positions would have been disorderly and could have had adverse market effects on their positions and that of many other market participants. The possibility of this situation occurring was not fully considered by either LTCM or its creditors.

This raises the issue of how events that are assumed to be extreme and very improbable should be incorporated into risk-management and business practice, and how they should be dealt with by public policy. The risk management weaknesses revealed by the LTCM episode were not unique to LTCM and its creditors and counterparties. Financial market participants have made significant progress in recent years in strengthening risk-management capabilities. Nevertheless, as new technology has fostered a major expansion in the volume and, in some cases, the leverage of transactions, some existing risk models have underestimated the probability of severe losses. This shows the need for ensuring that decisions about the appropriate level of capital for risky positions become an issue that is explicitly considered; when outlier events are omitted from risk models, such decisions are made by default. While newer models are endeavoring to reflect such new realities more accurately and realistically, policy initiatives that are aimed at simply reducing default likelihoods to extremely low levels might be counterproductive if they unnecessarily disrupt trading activity and the intermediation of risks that support the financing of real economic activity.

The larger issue raised by LTCM is how to enhance the robustness of trading activity. Specific concerns include how to constrain the build-up of fragile positions with excessive exposure to risk without impeding trading activity that is needed to provide liquidity and absorb market shocks. Better credit discipline in trading relationships can help in both of these areas. First, improvement in credit discipline can prevent the build-up of large or concentrated exposures whose liquidation might destabilize markets, as appeared to have happened in the case of LTCM.

Second, better information about counterparties can reduce the likelihood of surprises about a trader, and make a destabilizing pulling back by counterparties less likely. Beyond changes in risk appetites that cause investors to withdraw from markets, doubts about a trader's creditworthiness also can impair the trader's ability to continue trading during periods of market turmoil. Thus, greater confidence about credit exposures in trading relationships will strengthen the ability of markets to withstand shocks.

One consideration regarding the possible approaches to managing the credit risk problem is that each has different costs and liquidity implications for different types of traders. In addition, market participants also have diverse levels of creditworthiness. Thus, the costs and benefits of alternative credit-risk control arrangements are different across market participants, and such differences probably should be taken into account in policy initiatives.

## D. Counterparty Losses and Market Disruptions That May Have Resulted from a Default of LTCM

A default by the LTCM Fund would have caused counterparties to move quickly to limit their exposures. These risk-limiting moves may have required the liquidation or replacement of positions and collateral in the many markets where the LTCM Fund held sizable positions at depressed prices. These very actions in a market that, last September, was already suffering from a substantial reduction in liquidity could have resulted in significant losses. LTCM itself estimated that its top 17 counterparties would have suffered various substantial losses — potentially between $3 billion and $5 billion in aggregate — and shared this information with the fourteen firms participating in the consortium. The firms in the consortium saw that their losses could be serious, with potential losses to some firms amounting to $300 million to $500 million each. Moreover, if the LTCM Fund had defaulted last September, the losses, market disruptions, and the pronounced lack of liquidity could have been more severe if not for the use of closeout, netting, and collateral provisions.

### LTCM's trading activities and counterparties

LTCM's counterparties and the assets that they traded included the following.

**Prime Broker**. Like most hedge funds, LTCM centralized much of its custodial, recordkeeping, clearance, and financing services with a single firm. This bundle of services is typically referred to as prime brokerage and generally includes the following: providing intraday credit to facilitate foreign exchange payments and securities transactions; providing margin credit to finance purchases of equity securities; and borrowing securities from investment fund managers on behalf of hedge funds to support the hedge funds' short positions (thus allowing investment funds to avoid direct exposure to hedge funds). LTCM's prime broker was, and still is, Bear Stearns.

**Futures clearing firms**. At the time of the LTCM Fund's near failure, Bear Stearns also served as a clearing firm for LTCM's U.S. exchange-traded futures activity, while Merrill Lynch was the clearing firm for its trades on foreign futures exchanges. As such, the role of these clearing firms was to guarantee LTCM's positions with the relevant futures clearinghouses, thus bearing significant credit exposure to the LTCM Fund. Both Bear Stearns and Merrill Lynch required LTCM to post customer margin required by the futures exchanges, including both initial margin and, to cover the changing mark-to-market value of the LTCM Fund's futures positions, daily variation margin.

**Repo and reverse repo counterparties**. The LTCM Fund conducted repo and reverse repo transactions on U.S. and other government securities with approximately seventy-five counterparties.

**OTC derivatives counterparties**. The LTCM Fund engaged in OTC derivative transactions with about fifty counterparties. In most cases, the current mark-to-market exposure was collateralized. Some counterparties were even holding collateral to offset potential future exposure. In some cases, the LTCM Fund held very substantial OTC derivatives positions related to reference assets that were not actively traded. There was little liquidity in these specific instruments, even under normal circumstances.

**Loan counterparties**. For liquidity management, LTCM had arranged for syndicated credit facilities involving several dozen banks. Much of the credit available was not drawn on until the time of the near-collapse of the fund, however, and was not a major factor in the fund's build up of leverage.

**Market liquidity in September 1998 and potential effects of an LTCM default**

In assessing the effect of an LTCM default in late September 1998, it is helpful to recall that the market turmoil of the summer (and particularly August) had already caused sizable trading losses at many financial firms. These losses led to a general pullback in firms' willingness to take on risk positions and was evident in the "flight to quality" observed during this period. A severe decline in overall market liquidity was apparent in increased levels of excess bank reserves and a decline in repo and reverse repo positions — both indicative of a desire among firms to conserve liquidity. LTCM itself experienced substantial difficulty in reducing the LTCM Fund's risk positions during this period, even though it was not attempting to reduce all of its positions at the same time.

As noted above, the LTCM Fund held a great variety of relatively large positions with numerous trading partners. Those positions, combined with the market volatility and lack of liquidity might have led to a series of dramatic and punishing events for LTCM's trading counterparties and the markets themselves in the event of a default by the LTCM Fund.

By the time the LTCM Fund got into serious financial difficulties, Bear Stearns had ceased to provide intraday clearing credit. However, Bear Stearns was still a major securities lending counterparty with the LTCM Fund, putting it in a position similar to the Fund's repo and reverse repo counterparties. In closing out these transactions, the LTCM Fund's counterparties would have rapidly sold or purchased securities in the market. Because the cost of closing out their positions might have proved greater than the realized value of the securities or cash held as collateral by repo, reverse repo, or securities lending counterparties of the LTCM Fund, these counterparties were still exposed to losses in the event of a default by the Fund.

Like its other counterparties, the LTCM Fund's OTC derivatives counterparties would have had to re-balance their portfolios in an effort to reduce risk brought on by a default of the Fund. All of these counterparties would have needed to re-establish positions and hedges related to any contracts upon which the LTCM Fund had defaulted. The cost of closing out these positions might have proved greater than the value of the collateral ultimately realized. The risk of loss would have been particularly high for derivatives counterparties of the Fund who were exposed to illiquid risk positions that would have been even more difficult to hedge or liquidate last September.

Finally, given that their syndicated lines of credit to LTCM were largely unsecured, the providers of the credits discussed above would have lost nearly all amounts outstanding under these loans.

**The effect of closeout and netting in mitigating losses**

As described above, the losses suffered by the LTCM Fund's trading counterparties in the event of a default would have been considerable. This would have been true even though the U.S. Bankruptcy Code makes an exception to the automatic stay with respect to contractual rights to net and closeout positions in certain financial contracts in the event of default. However, the use of closeout and netting rights by these counterparties, which is not subject to the automatic stay, may have mitigated these losses and tempered any ensuing instability in the market. In the event of default, these rights, in general, contribute to the stability of markets as a whole by reducing the potential size of credit exposures and thus lowering the probability that the inability of one market participant to meet their obligations will cause others to be unable meet their obligations (*i.e.*, domino effects).

Closeout, or termination, refers to the right under a master agreement to terminate one or more contracts immediately upon certain specified events and to compute a termination amount due to, or due from, the defaulting party. The termination amount is generally based upon the value of the contract at the time of closeout. The ability to terminate most financial market contracts upon an event of default is central to the effective management of market risk by financial market participants like the trading counterparties of the LTCM Fund. Without these rights, parties are left with uncertainty as to whether the contracts will be performed, resulting in uncontrollable market risk. By providing for termination of a contract upon the default of a

counterparty, a participant can remove uncertainty as to whether a contract will be performed, fix the value of the contract at that point, and attempt to re-hedge itself against its market risk.

Closeout goes hand in hand with netting, another valuable legal right which operates as a risk-reducing mechanism whenever a party to a financial contract defaults. Netting refers to the right to set off, or net, claims or payment obligations between two or more parties — with the goal of arriving at a single obligation that runs between these parties. Under current U.S. law, financial institutions in the United States can net and closeout a variety of financial contracts without fear that a bankruptcy court will try to reverse such procedures vis-a-vis a counterparty that has defaulted. Moreover, closeout netting in connection with financial transactions of the type undertaken by the LTCM Fund generally is exempt from being temporarily blocked by the automatic stay that usually applies upon a filing of a bankruptcy petition.

In financial transactions like those described in this section — securities lending and borrowing; futures purchases, sales, and clearing; repo and reverse transactions; and OTC derivatives contracts — netting can serve to reduce the credit exposure of counterparties to a failed debtor and thereby limit "domino failures" and systemic risk. The ability to net may also contribute to market liquidity by permitting more activity between counterparties within prudent credit limits.[16] This added liquidity can be important in minimizing market disruptions due to the failure of a market participant.

**Potential market impact of disorderly liquidation**

In addition to the credit losses that LTCM's creditors and counterparties would have suffered, a default also could have had broader consequences for the markets in which these firms were active. First, the liquidation and closing out of positions could have generated significant movements in market prices and rates, affecting the market value of positions held by the LTCM Fund's counterparties as well as by other market participants. Second, the resulting rush by the Fund's counterparties and others to reappraise their credit risks, coupled with an increase in uncertainty, could have exacerbated the broader decline in market liquidity, making it more difficult for market participants to manage risks. Third, those firms with exposures to LTCM could have encountered increased concerns about their own credit standing, with a resulting rise in their cost of obtaining funds.

The LTCM Fund's counterparties and creditors were facing the risk posed by the impact of a default by the LTCM Fund in the unusual market environment prevailing in late September. By that time, worldwide investor confidence had already reached a low ebb. Although markets were already operating in a low interest-rate environment, the flight to safety further reduced the

[16] Although an individual counterparty's gross positions with the LTCM Fund might arguably have been smaller if they had been unable to rely on netting, this may not mean that the Fund's gross positions would have been significantly smaller. It is possible that the LTCM Fund would have assumed the same gross positions by dealing with more counterparties.

yield on the longest-maturity U.S. Treasury bond to a thirty year low on Friday, September 18. During the previous month, interest rate spreads had widened substantially, while equity markets around the world had suffered significant declines. The level of economic uncertainty as measured by market volatility had risen while liquidity was declining. Finally, most major market participants had already suffered significant trading losses during August and September, and were anxious to avoid further losses.

In the midst of these extraordinary market conditions, a default by the LTCM Fund could have had effects different from a default during less unsettled market conditions. The LTCM Fund's counterparties would have had to manage the effects of the direct credit losses from the default as well as further indirect effects if the default accelerated a flight to safety and liquidity that was already occurring.

**Effects of the use of collateral by LTCM's trading partners**

The parties to many of the transactions referred to in this section often rely on collateral from their counterparties. Current credit exposure under OTC contracts can be collateralized, current exposures under securities lending, repo, and reverse repo transactions are in effect collateralized, and the use of margin in futures trading is a form of collateral-taking. The right to liquidate assets held as collateral without judicial approval in the event of a bankruptcy is very important to the preservation of liquidity among financial market participants. Together with closeout rights and netting, the use of collateral can effectively reduce current credit risk in financial contracts.

However, there can be limits to the benefits of using collateral. Those firms relying on collateral posted by LTCM, particularly the counterparties to OTC derivatives trades with the LTCM Fund, generally did not demand collateral based upon calculations of potential future exposure. If its collateral holdings did not reflect potential future exposure, then a firm selling collateral provided by LTCM in the event of a default would still have been exposed to the difference between the value of the collateral and the value of the closed-out financial contract at the time the collateral was sold. Given how much financial markets can shift — and the extremely unsettled market conditions last September — these types of losses could have been considerable in the event the LTCM Fund had defaulted on its obligations.

When illiquid assets are posted as collateral, they can be difficult to sell in the event of a default, particularly in times of market stress. This probably would not have been the case with LTCM, given that much of the collateral pledged by the firm consisted of government securities for which there was a very liquid market. However, as is discussed later in this report, in the event the LTCM Fund had declared bankruptcy in its chartering jurisdiction, the Cayman Islands, there is some legal uncertainty as to whether the rights of its counterparties to liquidate collateral under the U.S. Bankruptcy Code would have been delayed. This may have provided a further incentive to the LTCM Fund's creditors to avoid a bankruptcy scenario. (An amendment to the

U.S. Bankruptcy Code proposed by the Working Group would create a sounder legal basis for relying on the right to liquidate collateral in future such cases.)

## II. PUBLIC POLICY ISSUES

### LEVERAGE AND RISK

The public policy issue raised by market participants' use of leverage is, first, determining the proper balance between the benefit leverage confers to markets and the potential systemic risk posed by high levels of leverage. If it is determined that, from time to time, existing mechanisms do not adequately limit the use of leverage, resulting in unacceptably high levels of systemic risk, then the question becomes one of how best to address this concern.

Leverage allows an investor to take on higher risks, including those risks that are shed by others. Thus, the leveraged exposure of investors with higher risk appetites can be a vehicle that allows a larger number of risk-averse investors to reduce their risks. While the leverage that supports the reallocation of risk provides benefits, it can be fragile. In a volatile market, high levels of leverage increase the likelihood that a leveraged entity will fail, in part because the size of potential losses can seriously deplete and even wipe out the entity's net worth.

When leveraged investors are overwhelmed by market or liquidity shocks, the risks they have assumed will be discharged back into the market. Thus, highly leveraged investors have the potential to exacerbate instability in the market as a whole. The outcome may be direct losses inflicted on creditors and trading counterparties, as well as an indirect impact on other market participants through price changes resulting from the disappearance of investors willing to bear higher risks. The indirect impact is potentially the more serious effect. Volatility and sharp declines in asset prices can heighten uncertainty about credit risk and disrupt the intermediation of credit. These secondary effects, if not contained, could cause a contraction of credit and liquidity, and ultimately, heighten the risk of a contraction in real economic activity

The leverage employed by hedge funds is acquired through derivatives transactions, repurchase agreements, short sales, and direct financing. In probably all cases, these exposures are collateralized at current market value. However, in the case of LTCM, the potential future exposure was not adequately collateralized relative to the creditworthiness of the LTCM Fund or to the potential price shocks the markets were facing in September 1998.

Banks and securities firms have viewed hedge funds as desirable trading customers. For instance, dealers earn trading revenue from the funds' transactions flows without directly bearing the risks undertaken by the funds. Hedge funds' willingness to take on risks also may make it easier for dealers to execute hedging transactions to shed unwanted risks. Competition for hedge fund business may have led to a gradual erosion of risk management practices with regard to some hedge fund customers, and certainly with respect to the LTCM Fund in particular.

## A. Measuring Leverage and Risk

Placing direct constraints on leverage presents certain difficulties. Given investors' diverse exposures to risk, and differences in their links to other market participants, requiring a uniform degree of balance-sheet leverage for all investors does not seem reasonable. First, balance-sheet leverage by itself is not an adequate measure of risk. For any given leverage ratio, the fragility of a portfolio depends on the market, credit, and liquidity risks in the portfolio. In addition, a high capital requirement based on balance-sheet concepts alone might induce fund managers to shift their risk-taking activities to more speculative trading strategies as they seek to meet rate-of-return targets on the required capital. It could also induce managers to move to off-balance-sheet risk-taking strategies such as through the use of derivatives.

An alternative measure to balance-sheet leverage is the ratio of potential gains and losses relative to net worth, such as value-at-risk relative to net worth. An advantage of such a statistical measure is its ability to produce a more meaningful description of leverage in terms of risk. A disadvantage is the potential pitfalls in measuring value-at-risk, such as through faulty or incomplete modeling assumptions or narrow time horizons. These issues suggest that enforcing a meaningful regulatory capital requirement or leverage ratio for a wide and diverse range of investment funds would be a difficult undertaking.

An alternative tool for indirectly influencing excessive leverage is credit-risk management. Credit-risk management can help to constrain the leverage employed by significant market participants, including hedge funds, thereby reducing systemic risk. The diversity of the credit risk and liquidity profiles of borrowers has led creditors to use a variety of tools to control credit risk. Public policy initiatives relating to hedge funds should build upon those practices that have worked well, and should encourage their use and improvements in their implementation.

**Collateral, capital, information, and the price of credit**. Collateralization and the use of credit-risk spreads on credit exposures, including trading exposures, offer alternative ways of managing these same types of credit risk. The method which is chosen typically depends on the relative costs to the customer of the collateral and the credit spread that provide equivalent compensation to the creditor for the credit risk.[17] With collateralization, collateral provided by the borrower provides protection to the lender against losses from default. When credit-risk spreads are used, the lender's capital and loan-loss reserves provide protection against losses from default, and the credit spread on the loan provides compensation to the lender for the cost of capital and reserves, plus a risk premium. For customers who can easily provide information demonstrating their creditworthiness, credit may be acquired on an unsecured basis because the credit risk spread is of lower cost than the cost of providing collateral. Supervisors and regulators of banks and securities firms usually have not interfered in private choices regarding different

[17] For a commercial property developer, providing the property as collateral is typically cheaper than paying the unsecured credit risk spread, while for a highly creditworthy corporate borrower, issuing unsecured notes may be cheaper than providing collateral.

approaches to managing credit risk, as long as prudential standards are satisfied. For instance, in regulatory bank capital requirements, collateralized derivatives exposures have lower capital requirements than uncollateralized exposures, but the decision to collateralize has remained with the counterparties to the transaction.[18]

**Tradeoff between credit and liquidity risk**. Another example of the diversity in credit risk management practice is in the use of variation margin. Variation margin can reduce the credit exposure in a derivative transaction, but only at the cost of imposing higher liquidity risk on the counterparties. For highly creditworthy counterparties, the cash-flow management demands of daily variation margin can impose costs that exceed the benefit from credit risk reduction. For other counterparties, however, the benefits of lower credit risk resulting from variation margin may exceed the costs imposed by higher liquidity risk. Thus, allowing diversity in credit-risk management practices can result in a more efficient financial system.

### B. Private Counterparty Discipline and Government Regulation

The primary mechanism that regulates risk-taking by firms in a market economy is the market discipline provided by creditors, counterparties (including financial contract counterparties), and investors. In principle, if a firm seeks to assume greater risks, either by increasing the riskiness of its assets or by increasing its leverage, creditors will respond by increasing the cost or reducing the availability of credit to the firm. The rising cost or reduced availability of funds provides a powerful economic incentive for firms to constrain their risk-taking.

Counterparty discipline can serve as an effective tool to mitigate the risks of excessive leverage. The constraint on leverage imposed through counterparty credit terms can occur directly through trading and credit limits or initial margin, and indirectly through credit spreads on transactions that would lower the returns from leveraged positions. The exercise of credit discipline in trading relationships has the potential to provide a balance between the benefits and risks of leverage. The counterparty's assessment of its ability to shoulder the credit exposure to the leveraged entity should constrain leverage below excessive levels. Such counterparty discipline, however, failed to constrain leverage adequately in the case of LTCM.

Such market discipline tends to be effective when creditors have the incentives and the means to evaluate the riskiness of the firm to adjust credit terms accordingly. In some cases, however, either the incentives or the means are lacking. Incentives will be reduced or eliminated if creditors do not perceive themselves to be adversely affected by increases in the firm's level of risk. In particular, if the firm's obligations are guaranteed by a financially strong third party (*e.g.*, a government), its creditors may be indifferent to its level of risk. If the firm is able to obtain

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[18] This decentralized approach to managing credit risk, overall, has worked reasonably well. At the end of 1998, for example, total credit losses from OTC derivatives at US banks were only 0.21 of a percentage point of the average outstanding credit exposure for the year. In 1997, the figure was less than 0.05 of a percentage point

financing from unsophisticated creditors — for example, from retail investors — those creditors may not have the means to accurately evaluate the firm's riskiness and, therefore, may not insist on credit terms commensurate with the firm's level of risk.

Even when creditors have the incentives and means to provide market discipline, risk-taking will not always be effectively constrained. Evaluation of the riskiness of firms is inherently difficult, and errors in evaluation and/or judgement are probable. Thus, business failures and losses to creditors will occur. In general, however, the failures and losses that have occurred have been small relative to the benefits of a market economy.

Consequently, in our market-based economy, market discipline of risk taking is the rule and government regulation is the exception. Generally, government regulation becomes necessary because of market failure or the failure of the pricing mechanism to account for all social costs. Government regulation of markets is largely achieved by regulating financial intermediaries that have access to the federal safety net, that play a central dealer role, or that raise funds from the general public. Any resort to government regulation should have a clear purpose and should be carefully evaluated in order to avoid unintended outcomes.

## BANKRUPTCY ISSUES

### A. Closeout Netting

The LTCM episode raises some issues involving the U.S. Bankruptcy Code. The first involves clarifying the ability of certain counterparties to exercise their rights with respect to closeout, netting, and liquidation of underlying collateral in the event of the filing of a bankruptcy petition without regard to the Bankruptcy Code's automatic stay.

These provisions, which the President's Working Group on Financial Markets urged Congress last year to expand and improve, are generally recognized to be important to market stability. They serve to reduce the likelihood that the procedure for resolving a single insolvency will trigger other insolvencies due to the creditors' inability to control their market risk. In other words, this protects the market from the systemic problem of "domino failures."

Nevertheless, in certain circumstances, a simultaneous rush by the counterparties of a defaulting market participant to replace their contracts could put pressure on market prices To the extent that the default was due to fluctuations in market prices in these contracts, this pressure might tend to exacerbate those fluctuations, at least in the near term. This problem could be significant where the defaulting debtor had large positions relative to the size of the market.

The possibility of a debtor defaulting during volatile markets where the debtor had large positions relative to the size of certain markets was the specter created by the potential default of the LTCM Fund. In the highly volatile markets of September 1998, the failure of the LTCM

Fund would have left a number of creditors with open market positions subject to extreme volatility. Termination of those contracts would have required counterparties to replace contracts that they held with the LTCM Fund in the relatively near term. However, had termination not been available to the LTCM Fund's counterparties in the bankruptcy process, the uncertainty as to whether these contracts would be performed would have created great uncertainty and disruptions in these same markets, coupled with substantial uncontrollable market risk to the counterparties. The inability to exercise closeout netting rights could well have resulted in an even worse market situation if the LTCM Fund had filed for bankruptcy than the exercise of such rights in this situation.

**B. Transnational Issues**

The bankruptcy of any financial entity doing business in a number of markets around the world raises a number of legal issues that are incapable of resolution by any single country's laws or judicial policies. As such, the bankruptcy of the LTCM Fund would in all likelihood have been a drawn-out and expensive process for LTCM, any affected creditor, and any bankruptcy court. However, two amendments to the Bankruptcy Code might have led to greater legal certainty for any LTCM Fund bankruptcy proceeding in the U.S. They involve: (1) whether the "main" insolvency proceeding of hedge funds like the LTCM Fund, that are organized abroad but have substantial U.S. operations, should take place in U.S. courts under U.S. law and (2) the ability of counterparties of bankrupt foreign debtors to liquidate their U.S. collateral promptly. Both of these issues have been addressed by bankruptcy reform legislation under consideration by the U.S. Congress.

The Bankruptcy Code normally governs the bankruptcy of nonbank debtors in the United States. However, like many hedge funds, the LTCM Fund was a partnership organized in the Cayman Islands. Although the management of the Fund was effected through a Delaware limited partnership located in Connecticut — a separate entity called Long-Term Capital Management, L.P. — it is believed that the Fund itself would have sought bankruptcy protection in the Cayman Islands courts, under Cayman law. Had that been the case, any U.S. bankruptcy proceeding would likely have been ancillary to the main Cayman Islands proceeding.

Section 304 of the U.S. Bankruptcy Code ("Section 304") specifies general criteria for determining whether a U.S. bankruptcy court should defer to a foreign bankruptcy proceeding such as the one that probably would have occurred with the LTCM Fund and its affiliates. However, the Bankruptcy Code does not clearly address when a debtor's "main" insolvency proceeding must take place in the U.S. courts. In 1997, the United Nations Commission on International Trade Law ("UNCITRAL") approved a model statute establishing clear conventions to differentiate between a "main" insolvency proceeding and a "non-main" proceeding for debtors located in more than one jurisdiction, which would better facilitate the marshaling and distribution of a debtor's assets. Amendments to U.S. and foreign bankruptcy laws based on the UNCITRAL language would make it much more likely that with entities like the LTCM Fund, whose main

place of business is the U.S., the U.S. bankruptcy proceeding would be the "main", and not an ancillary, bankruptcy proceeding.

If a hedge fund like the LTCM Fund were to declare bankruptcy in a non-U.S. jurisdiction like the Cayman Islands, Section 304 permits a receiver appointed by the non-U S. court to seek an injunction (a "Section 304 Injunction") in a U.S. bankruptcy court. Among other things, the foreign receiver can try to use the injunction to freeze temporarily actions by U.S. creditors that affect the bankrupt party's U.S. assets. If LTCM had declared bankruptcy in the Cayman Islands, its Cayman receiver could have sought a Section 304 Injunction prohibiting at least temporarily the liquidation of U.S. collateral pledged by LTCM to its counterparties. Even a temporary delay in the liquidation of collateral could have had detrimental financial consequences for those parties holding that collateral.

It should be noted that when the main bankruptcy proceeding occurs in the U.S., creditors have clear rights to liquidate collateral held under a wide range of financial contracts. The weakness under current law is the treatment of collateral by U.S. entities when the U.S. proceeding is ancillary to a main proceeding taking place abroad. It is also possible that in the case of an LTCM Fund bankruptcy in the Cayman Islands, some trading counterparties of LTCM would have liquidated collateral despite a pending Section 304 Injunction favoring a Cayman receiver, litigating any resulting claims.

However, an amendment to the Bankruptcy Code recently proposed by the Working Group would likely prevent the use of the Section 304 Injunction by a foreign receiver to thwart counterparties of a bankrupt entity from selling collateral they hold from that entity, where the main bankruptcy proceeding is held outside the U S. Enactment of this amendment would enhance the reputation of the U.S. market by providing greater legal certainty that collateral can be sold when it is needed most. Along with the previously discussed UNCITRAL-based proposal, these changes in law would likely improve the disposition of a bankruptcy of a hedge fund.

## III. CONCLUSIONS AND RECOMMENDATIONS

The central public policy issue raised by the LTCM episode is how to constrain excessive leverage more effectively. As events in the summer and fall of 1998 demonstrated, the amount of leverage in the financial system, combined with aggressive risk taking, can greatly magnify the negative effects of any event or series of events. By increasing the chance that problems at one financial institution could be transmitted to other institutions, leverage can increase the likelihood of a general breakdown in the functioning of financial markets.

Although LTCM is a hedge fund, this issue is not limited to hedge funds. Other financial institutions, including some banks and securities firms, are larger, and generally more highly leveraged, than hedge funds. LTCM, with total assets of $129 billion at the end of 1997, was significantly larger than any other reporting hedge fund family at that time. Only 11 reporting hedge fund families, including LTCM, had total assets exceeding $10 billion at the end of 1997. At the end of 1998, LTCM's total assets were $89 billion. The notional amount of LTCM's total OTC derivatives position was $1.3 trillion at the end of 1997 and $1.5 trillion at the end of 1998. LTCM's balance sheet leverage was 28-to-1 at the end of 1997.

By comparison, at the end of 1998, the five largest commercial bank holding companies had total assets ranging from $261.5 billion to $617.7 billion, and the replacement value of their derivatives ranged from $20.6 billion to $61.6 billion. The five largest investment banks had total assets that ranged from $154 billion to $318 billion, and the replacement value of their derivatives ranged from $10 billion to $22 billion. In addition, six commercial bank holding companies and two investment banks had notional derivatives amounts of well over $1 trillion in December, 1998. The average balance sheet leverage of these large commercial bank holding companies and investments banks is also significant. At year-end 1998, the five largest commercial bank holding companies had an average leverage ratio of nearly 14-to-1, while the five largest investment banks' average leverage ratio was 27-to-1.

While leverage can play a positive role in our financial system, resulting in greater market liquidity, greater credit availability, and a more efficient allocation of resources in our economy, problems can arise when financial institutions are not disciplined in extending credit to their customers and counterparties. The LTCM episode well illustrates the need for all participants in our financial system, not only hedge funds, to face constraints in the amount of leverage they can assume.

Commercial and investment banks have more diverse sources of revenue, as well as more diverse funding sources, than hedge funds, and hence they may be more able than hedge funds to ride out periods of market turbulence. In times of market turbulence, however, banks and securities firms may have more inflexible cost structures than hedge funds, due to significantly higher fixed operating expenses, and they may also have more illiquid assets. This may tend to offset the benefits of the more diverse sources of revenues and funding enjoyed by banks and securities firms. At the same time, banks, broker-dealers, and futures commission merchants

("FCMs") are subject to federal government oversight that addresses risk management systems, public disclosure, and capital requirements.

To constrain the leverage of both regulated and unregulated financial entities, our market-based economy relies primarily on the discipline provided by creditors, counterparties, and investors. If a firm seeks to achieve greater leverage, its creditors and counterparties ordinarily will respond by increasing the cost or reducing the availability of credit to the firm. History tells us, however, that creditors, counterparties and investors from time to time misjudge their risks, and that sometimes they become complacent in their risk assessments in an attempt to achieve higher returns. Reasons for believing in the general effectiveness of private market discipline include:

- Banks and securities firms have both the incentives and the capabilities to use risk management practices that apply effective counterparty and credit discipline to protect the capital and profitability of the firms.

- Shareholders of banks and securities firms can exert pressure on management to reduce excessive risk taking if there is adequate transparency so that investors can make assessments concerning an entity's risk taking. Hedge funds that are perceived to be taking excessive risks may face withdrawals and may have trouble attracting new investors.

- Hedge funds and other financial institutions cannot achieve significant leverage without the credit and clearing services of the large banks and securities firms that are at the center of the securities and derivatives markets.

If one looks at the history of financial markets, however, it is also true that market-based constraints can break down in good times as creditors and investors become less concerned about risk, and fail to manage risk appropriately. In the case of LTCM, market discipline seems to have largely broken down. LTCM appears to have received very generous credit terms, even though it took an exceptional degree of risk. The breakdown in market discipline was made possible by risk management weaknesses at LTCM as well as at the large banks and securities firms that were LTCM counterparties. In some cases sound policies were in place, but the pressure to generate profit seems to have caused actual practices to deviate from those policies.

Reviews by banking regulators and by the SEC indicate that financial firms did not fully understand LTCM's risk profile and that some may not have adequately contemplated the market and liquidity risks that would have arisen if LTCM had defaulted. As the complexity, volume, interrelationship, and, in some cases, the leverage of transactions increased, the existing risk management procedures underestimated the probability of severe losses.

Complacency during favorable economic times also contributed to an atmosphere which gave rise to inadequate review and excessively liberal credit terms. In this atmosphere, the

incident also raised questions concerning transparency and the adequacy of disclosure by highly leveraged institutions to their investors, creditors and counterparties in the markets in which LTCM was active. In any event, many of LTCM's counterparties did not establish meaningful limits on their exposures to LTCM.

The risk management weaknesses revealed by the LTCM episode were not unique to LTCM and its creditors and counterparties. Some of these weaknesses were also evident, albeit to a lesser degree, in investment and commercial banks' dealings with other highly leveraged counterparties, including other investment and commercial banks.

Even if market participants had better information and more fully understood the risks of their investments, their motivation is to protect themselves but not the system as a whole. Every firm has an incentive to restrain its risk taking in order to protect its capital, and firm managers have an incentive to protect their own investments in the firm. No firm, however, has an incentive to limit its risk taking in order to reduce the danger of contagion for other firms.

In the immediate aftermath of the LTCM episode, banks and securities firms have tightened their credit risk management policies vis-a-vis highly leveraged institutions. The heightened emphasis on risk management occurred not only due to the problems created by the LTCM episode, but also due to the increased global market instability brought on by the debt problems in several countries and the emerging markets in general. During the last quarter of 1998, financial institutions constrained the hedge fund industry by withdrawing capital and tightening credit standards. The hedge fund industry was further constrained by its own losses on certain investments. Recently, banks and securities firms have begun to loosen their credit relationships with hedge funds by easing the tighter conditions imposed in the fourth quarter of 1998, although there has not at this time been a return to the levels witnessed in the summer of 1998.

Market history indicates that even painful lessons recede from memory with time. Some of the risks of excessive leverage and risk taking can threaten the market as a whole, and even market participants not directly involved in imprudently extending credit can be affected.

Therefore, the Working Group sees the need for the following measures:

- more frequent and meaningful information on hedge funds should be made public;
- public companies, including financial institutions, should publicly disclose additional information about their material financial exposures to significantly leveraged institutions, including hedge funds;
- financial institutions should enhance their practices for counterparty risk management;

- regulators should encourage improvements in the risk management systems of regulated entities;

- regulators should promote the development of more risk-sensitive but prudent approaches to capital adequacy;

- regulators need expanded risk assessment authority for the unregulated affiliates of broker-dealers and futures commission merchants;[19]

- the Congress should enact the provisions proposed by the President's Working Group to support financial contract netting in the United States; and

- regulators should consider stronger incentives to encourage off-shore centers to comply with international standards.

Given the nature of today's global financial markets, the Working Group believes that it will be important that similar steps are taken in other countries, where relevant.

The Working Group has also considered some possible additional actions that could be given consideration if further evidence emerges that indirect regulation of currently unregulated market participants is not working effectively to constrain leverage. These possible additional actions are described in the final section of this chapter (section 8 below), although the Working Group is not recommending any of them at this time.

**1. Disclosure and Reporting**

Improving transparency through enhanced disclosure to the public should help market participants make better, more informed judgments about market integrity and the creditworthiness of borrowers and counterparties.

- Currently, the scope and timeliness of information made available about the financial activities of hedge funds are limited. Hedge funds should be required to disclose additional, and more up-to-date, information to the public. For hedge funds that are commodity pools, the Commodity Pool Operator ("CPO") filings currently may provide the best vehicle for conveying this information.

  - CPOs that currently report to the CFTC and exceed a certain *de minimus* size threshold, including those who manage hedge funds, should file quarterly reports rather than annual reports. Currently, these reports are filed on an annual basis. In addition, the reports that CPOs file with the CFTC could include more meaningful and comprehensive measures of

[19] See footnote 23 on page 39.

market risk (*e.g.*, value-at-risk or stress test results), without requiring the disclosure of proprietary information on strategies or positions. These individual financial reports should be published.

- For hedge funds that are not currently registered as CPOs, a means for disclosure should be developed to ensure that similar financial information is provided to the public. For these hedge funds, Congress would need to enact legislation that authorizes mechanisms for disclosure. Such legislation should be solely for the purpose of promoting public disclosure. All hedge fund reporting could possibly be consolidated in a single mechanism.

- Congress should enact legislation granting any additional authority necessary to achieve these goals.

- Public companies, including financial institutions, should publicly disclose a summary of direct material exposures to significantly leveraged financial institutions. To the extent covered, these entities should be aggregated by sector (*e.g.* commercial banks, investment banks, insurance companies, hedge funds and others). Public companies' exposures to significantly leveraged financial entities, including commercial banks, investment banks, finance companies, and hedge funds, may be in the form of equity, loans, or other credit exposures. Currently, neither SEC rules nor generally accepted accounting principles directly address disclosure requirements for companies with material exposures to significantly leveraged financial institutions. The interlocking nature of the financial exposures of highly leveraged financial institutions with each other leads to the potential contagion effect of financial difficulty originating initially in one firm. Requiring public companies to disclose their direct material exposures to significantly leveraged financial entities could serve to reinforce private market discipline upon these firms.

  - The proposed disclosure could be required to be incorporated in the Management's Discussion and Analysis or Description of Business in periodic financial statements. Such disclosures should be accompanied by appropriate information and analyses regarding how exposures are measured as well as the quality and diversification of exposures to highly leveraged institutions. The disclosures would be included in the periodic reports (*e.g.*, Form 10-K, Form 10-Q) filed by public companies with the SEC.

  - The proposed disclosures would be expected to apply to all public companies, including non-financial public companies, that have direct exposures to significantly leveraged financial institutions, as defined, that

are individually or in the aggregate (a) material to the investor's financial statements, or (b) could have a material effect on the investor's financial statements resulting from losses due to possible economic events or conditions.

- The precise nature of these regulations would be determined by the SEC, taking into account public comments through the normal rule-making process.

**2. Supervisory Oversight**

Banking, securities, and futures regulators should monitor and encourage improvements in the risk management systems of regulated entities. The bank regulators have recently issued new guidance on these issues. They must continue to be vigilant that this guidance is followed, including through the use of their examination authority. Banking, securities and futures regulators also need to follow market developments and practices in order to determine whether existing guidance is being followed and whether additional guidance is necessary.

- Regulators of banks, securities firms, and FCMs should ensure that they address the risk management weaknesses that have been identified. Bank regulators should draw on the analyses and recommendations of the Basle Committee on Banking Supervision's recent report outlining sound practices for banks' interactions with highly leveraged institutions. Securities and futures regulators may wish to consider drawing on the upcoming International Organization of Securities Commissions ("IOSCO") studies.

- Bank regulators should ensure that entities for which they have responsibility implement sound practices appropriate to the scale and complexity of the credit services they provide, investments they make and liabilities they incur. For example, bank regulators' guidance could address, where appropriate: the need to stress test credit, as well as market risk profiles; and the appropriateness of 100% financing on reverse repurchase agreements.

- Banks should ensure that counterparties develop meaningful measures of potential future credit exposure. These measures should be used to help set exposure limits. Supervisors should encourage banks to develop policies setting out the circumstances in which potential future exposures should be collateralized.

- The SEC should ensure that securities firms follow similar prudential practices in their counterparty and credit relationships. The SEC should also encourage securities firms to do the same with their unregulated affiliates. The CFTC should ensure that FCMs follow similar prudential practices in their counterparty and credit relationships, and encourage their unregulated affiliates to do the same.

- U.S. banking regulators have recently addressed a number of concerns by issuing guidance concerning:

  (a) the credit approval process and ongoing monitoring of credit quality;

  (b) limits on counterparty credit exposures and the exposure management process;

  (c) improving procedures for estimating potential future credit exposures and stress testing; and

  (d) the use of collateral.

- In particular, US banking regulators have recently notified banks that examiners will be looking at the following points:

  (a) Senior management and boards of directors must understand the strengths and weaknesses of their risk measurement systems, including model risk, liquidity risk, and risk of breakdown of historical correlations among different instruments and markets.

  (b) Senior management and boards of directors must have a realistic assessment of their tolerance for losses in adverse markets.

  (c) The interconnection of material risks, including market, credit, and liquidity risks, needs to be integrated into credit and risk management decisions.

  (d) Steps should be taken to minimize operational errors, such as unconfirmed trades and unsigned master agreements.

  (e) Legal risks, including contract enforceability and uncertainties concerning different legal regimes in different countries, must be clearly understood and controlled.

  (f) The credit standards applied with respect to trading activities should be consistent with the overall credit standards of the bank.

  (g) The risk oversight functions of banks must possess independence, authority, expertise, and corporate stature.

- The SEC will issue non-public inspection findings to several large broker-dealers, addressing the strengths and weaknesses of their particular credit risk management

structure, credit control procedures, and implementation of credit and other policies.

### 3. Enhanced Private Sector Practices for Counterparty Risk Management

As suppliers of credit implement improved standards, their own financial safety and soundness will be enhanced. In turn, they will impose greater discipline on borrowers.

- Financial institutions should continuously review their own risk management procedures.

- As a group, financial institutions should also draft and publish enhanced standards for risk management. Areas to be addressed should include:

  (a) the credit approval process and ongoing monitoring of credit quality, including the availability of information on counterparties and its use in making credit decisions;

  (b) procedures for estimating potential future credit exposures, including stress testing to gauge exposures in volatile and illiquid markets, and model validation procedures, including back-testing.

  (c) approaches to setting limits on counterparty credit exposures;

  (d) appropriate measurement of leverage and risk;

  (e) approaches to limit concentration of credit exposures;

  (f) approaches to limit concentration of exposures to particular markets;

  (g) fuller integration in risk management practices of the connections between credit and market risks;

  (h) procedures for exercising judgment given the inherent limitations of models;

  (i) policies regarding the use of collateral to mitigate counterparty credit risks;

  (j) valuation practices for derivatives and collateral;

  (k) procedures for close-out and liquidation of contracts and collateral, and

(l) procedures to consider legal risks in credit decisions, such as those stemming from questions concerning the legal authority of a counterparty to enter into a contract and the uncertainties arising from different jurisdictions' insolvency laws, commercial codes, and recognition of netting and termination rights.

- In this context, twelve major internationally active banks and securities firms have formed the Counterparty Risk Management Policy Group ("CRMPG"). This group is developing standards for strengthened risk management practices for banks, securities firms, and others that provide credit-based services to major counterparties in the derivatives and securities markets.

- Additionally, the International Swaps and Derivatives Association has recently (March, 1999) issued a review of collateral management practices that drew lessons from collateral managers' experiences during the LTCM episode and other recent periods of market volatility. The review set out 22 recommendations for enhancing collateral management practices and an action plan for facilitating their implementation.

- Also, the Institute of International Finance, Inc., has recently issued its "Report of the Task Force on Risk Assessment" (March, 1999).

- Private sector efforts by counterparties to collect and share credit information could be helpful (see Appendix F), consistent with the anti-trust laws.

- A group of hedge funds should draft and publish a set of sound practices for their risk management and internal controls. Such a study should discuss market risk measurement and management, liquidity risk management, identification of concentrations, stress testing, collateral management, valuation of positions and collateral, segregation of duties and internal controls, and the assessment of capital needs from the perspective of hedge funds. In addition, the study should consider how individual hedge funds could assess their performance against the sound practices for investors and counterparties.

**4. Capital Adequacy**

Prudential supervisors and regulators should promote the development of more risk-sensitive approaches to capital adequacy.

- The Basle Committee on Banking Supervision should proceed to revise the Capital Accord in order to align capital requirements more closely with the actual risks taken by financial institutions. These efforts include greater differentiation among claims (or instruments or counterparties) based on credit quality.

- The capital treatment applied to the credit exposure from a derivatives transaction should be similar to that of a commercial loan to the same counterparty, after taking into account the nature of any underlying collateral.

- Derivatives which have the same or almost identical market risk characteristics as the underlying instruments should have similar capital charges for such market risk. (Separate capital treatment is needed to address their credit risk.)

- Value-at-risk and other risk models should be subject to validation procedures, including rigorous back-testing, consistent with the Basle approach, in order to confirm the reliability and stability of their results.

- To determine the effect on exposures from low probability but high impact events, counterparties should conduct meaningful stress tests.

- Regulators in offshore banking centers need to be encouraged to impose internationally-agreed capital standards on banks in their jurisdictions.

- The SEC should explore more risk-sensitive approaches to capital for securities firms, building on its experience with its "broker-dealer lite" approach to capital for derivatives affiliates of broker-dealers. While alternative approaches should be explored, however, it is not the intent of this recommendation that capital requirements for broker-dealers should be reduced.

- The bank regulators and, to the extent possible under the existing regulatory scheme, the SEC, should carefully monitor the use of "double leverage," particularly where the borrowing is of a short-term nature. Borrowing by a holding company that effectively funds an equity position in a broker-dealer or bank can result in problems and lead to excessive leverage. While market discipline may serve to constrain excessive double leverage, regulators should be vigilant on this issue and take necessary steps if an institution appears to be carrying this practice beyond what prudence would suggest.

**5. Expanded Risk Assessment for the Unregulated Affiliates of Broker-Dealers and Futures Commission Merchants**

The current authority of the SEC, the CFTC, and the Treasury Department to require financial information about the unregulated affiliates of broker-dealers and FCMs should be

enhanced to monitor the risks posed by these market participants and the highly leveraged institutions which are their counterparties.[20]

One way to improve supervision would be to enhance the SEC's and CFTC's risk assessment authority to include expanded reporting, recordkeeping, and examination authority for material unregulated affiliates of broker-dealers and FCMs, along with consistent expansion of the Treasury's authority under the Government Securities Act.[21] Although the information currently gathered from broker-dealers and FCMs relating to their major unregulated affiliates, or "Material Associated Persons" ("MAPs"), is generally useful, it should be enhanced to provide a more comprehensive picture of the potential risks that an unregulated affiliate might pose to its related firm and to the financial system.[22]

For these reasons, there should be statutory changes to grant the SEC, the CFTC and the Treasury expanded risk assessment authority over broker-dealer and FCM unregulated affiliates.[23]

- As part of their enhanced risk assessment authority, the three regulators should be authorized to require broker-dealers, FCMs, and their unregulated affiliates to report credit risk information by counterparty. The reporting of this additional information would provide a comprehensive, periodic snapshot of unregulated broker-dealer and FCM affiliates and the financial risks they pose. There is overlap in these authorities, and the agencies will cooperate in order to eliminate duplicative requirements and multiple filings of the same information.

- This expanded authority should include the ability to require recordkeeping and reporting of non-aggregated position information.

- Additional data on concentrations (based on financial instrument, region, and industry sector), trading strategies, and risk models also are necessary for effective

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[20] The SEC has the authority to write rules to collect certain financial information from broker-dealers about significant affiliates, termed "Material Associated Persons" or "MAPs." The CFTC has similar authority to obtain information from FCMs about their MAPs. The Treasury Department has the authority to write rules requiring government securities brokers and dealers registered under Section 15C of the Exchange Act to submit information about their MAPs to the SEC.

[21] This new authority does not contemplate changing the scope of the existing authority over associated persons that are subject to examination by, or reporting requirements of, a federal banking agency.

[22] This authority does not contemplate changing the scope of the existing authority over associated persons that are subject to examination by, or reporting requirements of, a federal banking agency.

[23] On the issue of expanding risk assessment for the unregulated affiliates of broker-dealers and FCMs, Chairman Greenspan of the Federal Reserve Board declines to endorse the recommendation but, in this instance, defers to the judgment of those with supervisory responsibility.

monitoring. Concentration information for large counterparties, including hedge funds and other highly leveraged institutions, is presently unavailable to the SEC and the CFTC.

- The authority to review risk management procedures and controls conducted at the holding company level, and the ability to examine the records and controls of the holding company and its material unregulated affiliates, should also be included. The authority to compel this reporting and the opportunity to verify reported information would make the regulators' expanded risk assessment authority much more effective. The ability to inspect the books, records, risk models, and management controls of broker-dealer and FCM unregulated affiliates is necessary to ensure the reports prepared are complete and accurate. Finally, the regulators need the authority to test the risk models used by MAPs.

**6. Bankruptcy Code Issues**

The ability to terminate financial contracts upon a counterparty's insolvency enhances market stability. Such close-out netting limits losses to solvent counterparties and reduces systemic risk It permits the solvent parties to replace terminated contracts without incurring additional market risk and thereby preserves liquidity. The ability to exercise close-out netting also will generally serve to prevent the failure of one entity from causing an even more serious market disruption.

The near failure of the LTCM Fund raises several issues related to the Bankruptcy Code that should be addressed. The Working Group reaffirms its support for its legislative proposal entitled the "Financial Contract Netting Improvement Act," which was transmitted to Congress on March 16, 1998, a version of which is currently pending in Congress as Title X of H.R. 833. Specifically, the Working Group recommends:

- The improvements to the close-out netting regime for certain financial contracts proposed by the Working Group should be enacted into law. These proposals would improve the netting regime under the Bankruptcy Code by expanding and clarifying the definitions of the financial contracts eligible for netting and by explicitly allowing eligible counterparties to net across different types of contracts, such as swaps, security contracts, repos, and forward contracts.

- There should be clarification that a U.S. court would apply certain key U.S. bankruptcy law protections in an ancillary proceeding taking place in the U.S. This should also prevent the issuance of a judicial stay in an ancillary proceeding from preventing an eligible counterparty from exercising contractual termination, netting, and liquidation rights that are recognized under U.S. law. It should also prevent the possibility that a hedge fund organized offshore could file for bankruptcy abroad and then petition a U.S. court to issue an injunction preventing

the immediate sale of collateral located in the U.S. supporting financial contracts eligible for netting.

- The United Nations Commission on International Trade Law ("UNCITRAL") model statute should be codified, as would be done by Title IX of H.R. 833, which establishes clear conventions to differentiate between a "main" insolvency proceeding and a "non-main" proceeding for debtors located in more than one jurisdiction. These provisions would make it more likely that the jurisdiction of a main insolvency proceeding of an offshore fund would be determined by the principal place of business of the entity rather than the jurisdiction where the entity happens to be organized or incorporated. If these provisions had been law last year, it is more likely that if the LTCM Fund had failed, the main bankruptcy proceeding would have been in the U.S. rather than the Cayman Islands.

**7. Offshore Financial Centers and Tax Havens**

As the United States and other industrial countries continue to strengthen regulatory standards in their own countries, it will be important that other jurisdictions strengthen their supervisory systems and standards as well to ensure that hedge funds do not take advantage of any incentives to relocate to jurisdictions that do not meet international standards. Likewise, in the tax area, the fact that a significant number of hedge funds are established in offshore financial centers that are tax havens has focused attention on whether offshore hedge funds are associated with illegal tax avoidance and are taking advantage of their offshore situs for other inappropriate purposes.

- In the regulatory area, the U.S. regulatory agencies and the Treasury Department should continue to work with their counterparts internationally to consider measures to encourage offshore financial centers to adopt and comply with internationally-agreed upon standards developed by international organizations of regulators or supervisory authorities. A variety of incentives could be used:

  - A higher risk weight could be imposed on counterparty transactions for banks doing business with a financial entity operating out of an offshore jurisdiction that does not comply with Basle Core Principles.

  - Offshore financial centers' ability to join Basle-sponsored working groups and IOSCO could be made contingent on progress towards implementation of international supervisory and regulatory standards.

  - The G-7 and other countries with close relations with financial centers could press these centers to comply with international norms

- In the tax area, the prevalence of hedge funds in offshore financial centers raises a number of tax policy and other issues. These issues, however, as well as issues raised by LTCM events related to the tax treatment of total return equity swaps, are beyond the scope of this report and are being addressed separately by Treasury.

**8. Additional Potential Steps**

Through its constituent agencies, the Working Group will be monitoring the credit risk management policies of large commercial and investment banks and assessing the effectiveness of the measures outlined above as a means of addressing concerns about excessive leverage on the part of hedge funds and other highly leveraged market participants. Although the Working Group is not making additional recommendations at this time, if further evidence emerges that indirect regulation of currently unregulated market participants is not working effectively to constrain leverage, there are several matters that could be given further consideration to address concerns about leverage.

- Consolidated supervision of broker-dealers and their currently unregulated affiliates, including enterprise-wide capital standards. This would enhance the current regulatory regime applicable to investment banking firms. Affiliates of broker-dealers are often large, generally highly leveraged, and are growing in significance. Problems at an unregulated affiliate can affect the regulated broker-dealer adversely and the trading activities of these affiliates can have systemic risk implications.

- Direct regulation of hedge funds. For highly leveraged hedge funds, regulatory restraints, such as capital requirements, could serve to constrain more effectively their degree of leverage and the probability of a failure with systemic implications. It is possible, however, that directly regulating these institutions could drive some of them offshore, which could make regulation less effective. In addition, direct regulation of hedge funds could present formidable challenges in terms of cost and effectiveness. Therefore, we believe that the measures discussed above would best address concerns related to systemic risk without the potential attendant costs of direct regulation of hedge funds.

- Direct regulation of derivatives dealers unaffiliated with a federally regulated entity. Capital and other requirements could help to reduce the degree of leverage in these financial institutions. Bringing unaffiliated derivatives dealers into the regulatory regime, together with hedge funds and the unregulated affiliates of broker-dealers, would expand the regulatory net to cover additional potential sources of systemic risk. There could be difficulties in implementation that might not be completely offset by the benefits, particularly if institutions were driven

offshore. In any event, these issues are being studied and considered in the context of the Working Group's upcoming study of over the counter derivatives.

Concerns have been expressed about the activities of highly leveraged institutions with respect to their impact on market dynamics generally and vulnerable economies in particular. Such activity can affect markets in some circumstances and for limited periods although, as a number of independent studies that have been undertaken so far have suggested, the activities of highly leveraged institutions do not appear to have played a significant role in precipitating the financial market crises of the past few years. Further study of this issue will be undertaken by the Financial Stability Forum, recently established by the G-7.

The increase in cross-border financial flows, however, highlights the importance of an appropriate financial regulatory structure. In particular, emerging market economies could consider implementing protections, as exist in many major market financial centers, to promote market integrity and reduce systemic vulnerability. The Working Group believes that it is important for the international financial institutions and international regulatory bodies to work closely with emerging market economics in the development of better institutional arrangements, standards, and practices in these areas.

# APPENDICES

# APPENDIX A

ADDITIONAL INFORMATION ON HEDGE FUNDS

## 1. Hedge Fund Performance Fees, Leverage, and Short-term Outlook

Hedge funds are distinct in several important ways from other types of investment vehicles. Whether domestic or offshore, hedge funds generally share three operational characteristics that set them apart from mutual funds, private pension funds, and bank personal trusts: (1) hedge funds charge advisory fees based on performance;[1] (2) they use leverage more aggressively; and (3) they pursue short-term investment strategies. The performance fees encourage risk taking while leverage and short-term strategies enable the funds to compound the risks they are willing to bear.

**Performance fees**. Performance-based fees represent a strong incentive for risk taking. A typical hedge fund will charge a fee amounting to 20 percent of the gains above a specified benchmark or watermark over a one-year period. In most cases, the benchmark is the fund's net asset value at the beginning of the measurement period.[2] Performance fees encourage investment strategies that emphasize the probability of exceeding the return threshold. These strategies invariably entail greater risk of loss. The investment stake that fund managers typically have in a fund, however, would tend to mitigate incentive for excessive risk taking.

**Leverage**. Leverage allows hedge funds to magnify their exposures and, as a direct consequence, magnify their risks. Hedge funds are limited in their use of leverage only by the willingness of their creditors and counterparties to provide it. The funds typically operate with a balance-sheet leverage of less than 2-to-1, but higher balance-sheet leverage is not uncommon.

In contrast, the Investment Company Act of 1940 denies mutual funds such a high degree of leverage by limiting their issuance of "senior securities."[3] In practice, a mutual fund's debt effectively may not exceed 33 1/3% of its total assets. For this purpose, certain trading practices,

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[1] Some mutual fund advisers receive performance-based compensation based on "fulcrum fees." With a fulcrum fee, an adviser's compensation increases or decreases depending on how the fund performs relative to an appropriate index or other measure of performance over a specified period. See section 205(b)(2) of the Investment Advisers Act. In permitting mutual fund advisers to receive fulcrum fees, Congress noted that these types of fees "would insulate investment company shareholders from arrangements that give investment managers a direct pecuniary interest in pursuing high risk investment policies." H.R. Rep. No. 1382, 91st Cong., 2nd Sess. 41 (1970); S.Rep. No. 184, 91st Cong., 1st Sess. 45 (1969). Additionally, a mutual fund whose investors are limited to high-net worth persons and institutions may pay other types of performance-based compensation. See Investment Advisers Act rule 205-3. (17 CFR 275.205-3)

[2] In a small number of cases, the benchmark is the S&P 500

[3] For purposes of the Act's asset coverage test, a senior security generally includes "any bond, debenture, note, or similar obligation or instrument constituting a security and evidencing indebtedness, and any stock of a class having priority over any other class as to distribution of assets or payment of dividends" (*i.e.*, preferred stock). 15 USC 80a-18(g). The term does not include certain loans made "for temporary purposes only and in an amount not exceeding 5 percent ... of the value of the total assets of the issuer at the time when the loan is made." A loan is presumed to be for temporary purposes if it is repaid within 60 days and is not extended or renewed. *Id.*

such as reverse repurchase agreements and short sales, may involve the issuance of a senior security under the Investment Company Act.[4] The SEC also requires that mutual funds limit their investments in illiquid assets to 15% of net assets (10% in the case of money market funds). This limits the ability of a mutual fund to invest in illiquid derivatives.[5]

Certain derivatives may not constitute "balance-sheet" leverage, but might represent "economic" leverage (*i.e.*, they display heightened price sensitivity to market fluctuations). The Investment Company Act does not contain broad prohibitions on a mutual fund's investment in any particular type of instruments, including derivatives. A mutual fund that is investing, or may invest, in derivatives that present risks must provide prospectus disclosure about these transactions and the risks involved. The SEC also has emphasized the importance of the role of mutual fund directors in the oversight of fund derivative investments, risk management, internal controls, and disclosure, in order to assure that mutual fund assets are properly valued.

Hedge funds obtain economic leverage in various ways, such as through the use of repurchase agreements, short positions, and derivative contracts. At times, the choice of investment is influenced by the availability of leverage. In recent years, for example, government bond markets around the globe have become attractive investment locations for hedge funds, in part because of the liquidity of these markets and in part because of related repo markets that allowed the funds to leverage their positions.

**Short-term investment strategies.** Hedge funds are generally not buy-and-hold investors. In the first place, performance fees make it important for the funds to show substantial gains within a year. More importantly, hedge funds tend to seek prices that either diverge from fundamentals or offer arbitrage opportunities. Since these circumstances are supposed to be temporary, the funds hope to make money and unwind their positions in a short period of time. The propensity of hedge funds to alter market positions quickly distinguishes them from pension funds and bank personal trusts. Mutual funds, however, are similar to hedge funds in that they can quickly liquidate portfolios, but because of cost, tax, and other considerations, they may be less likely to shift their market positions often.

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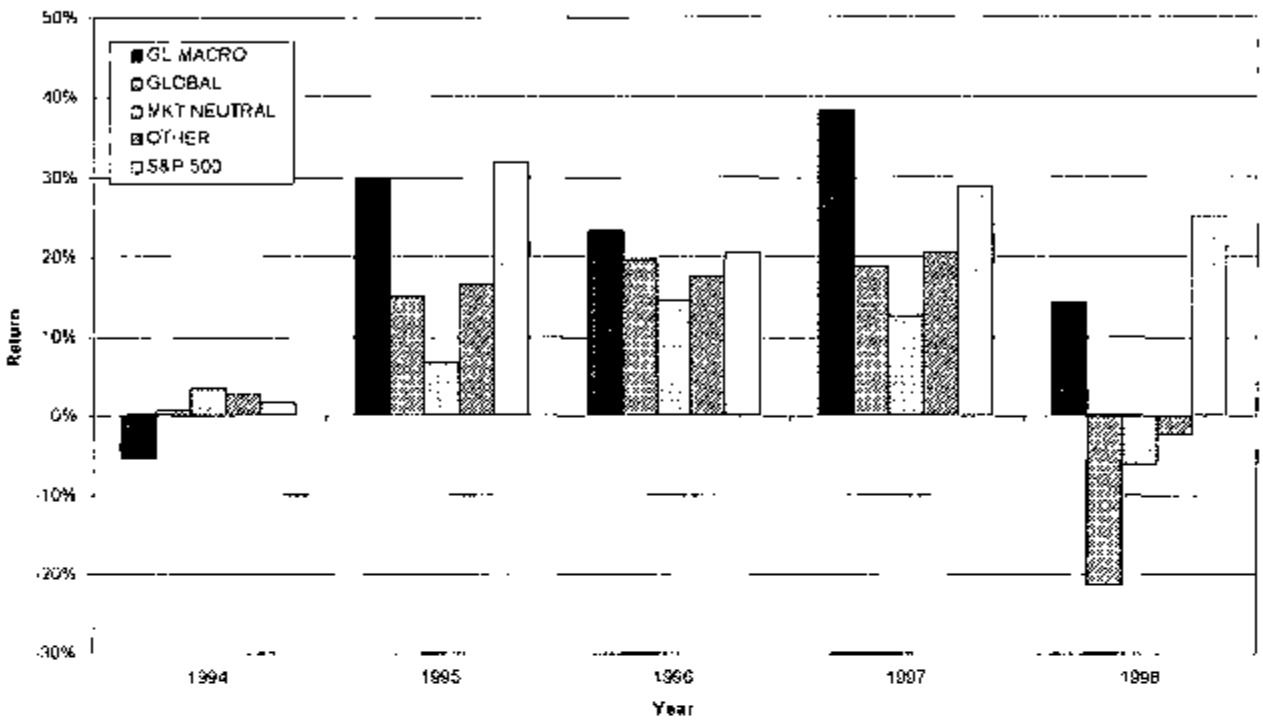
[4] The SEC requires funds to "cover" obligations created through these techniques by establishing segregated accounts consisting of liquid assets in an amount at least equal in value to the obligations. See, for example, Investment Company Act Release No. 10666 (Apr. 18, 1979); Merrill Lynch Asset Management, L.P. (pub. avail July 2, 1996). See also Appendix B of this report.

[5] An illiquid asset is any asset that may not be sold or disposed of in the ordinary course of business within seven days at approximately the value at which the mutual fund has valued the investment. See Investment Company Act Release No. 18612 (Mar. 12, 1992).

**Figure 1: Annual Returns of Hedge Funds by Investment Style**




Estimates based on data provided by MAR/Hedge.

## 2. Hedge Fund Performance and Survival

In recent years, the performance of hedge funds has varied widely depending on the type of fund and the time period. Figure 1 compares the performance of four classes of hedge funds with the S&P 500 based on annual returns from 1994 to 1997. No class of funds consistently outperformed the S&P 500. Global macro funds, that is, those funds that take positions based on their forecasts of global macroeconomic developments, enjoyed good returns from 1995 to 1997, a period characterized by a bull market in U.S stocks and bonds. Only in 1996 and 1997, however, did these funds do better than the S&P 500. The global funds, which focus on foreign stocks and bonds, also did well during the period shown, but only in 1996 did they outperform the stock market. The market neutral funds, which focus on relative price movements of similar assets, tended to perform relatively poorly, except in 1994 when most of the other funds seem to have suffered from the bear market in U.S. bonds and from the Mexican crisis at the end of that year.

The larger hedge funds — specifically the global macro funds and the global funds — are on the average riskier investments than the stock market as a whole. Table 1 below compares the average returns and risks among hedge fund categories and the U.S. stock market during the period from January 1994 to December 1997. During this period, global macro and global funds showed more impressive performance than the other hedge funds but they also took on greater risk. The average volatilities of these two classes of funds exceeded that of the stock market as a whole. The market-neutral funds and other funds performed poorly relative to S&P 500 but did so with less volatility than the stock market. The table also reports average Sharpe ratios, which measure returns relative to risk.[6] Based on these ratios, the S&P 500 represented a better trade-off of risk and return than the global macro and global funds but a worse trade-off than the other hedge funds.

The risks the funds take and their need to meet return watermarks tend to lead to high failure rates. The funds that fail, however, usually close before net asset values fall to zero. Table 2 shows the number of funds that survived over different periods starting from a sample of 397 funds in December 1994. For this entire sample of funds, fewer than three-fifths survived through the end of 1998.[7] The global macro funds, which are the funds with the highest returns, show the lowest survival rate with only slightly more than one-third of the funds still in operation after four years. The market neutral funds with the lowest return volatilities display the highest survival rate, with more than three-fourths of the funds surviving through June 1998.

**Table 1**
**Sharpe Ratios and Average Monthly Returns**
**1994 -1998**

| Classification | Mean Return | Mean Volatility | Sharpe Ratio |
|---|---|---|---|
| Global Macro | 0.212 | 0.179 | 1.318 |
| Global | 0.095 | 0.220 | 1.285 |
| Market Neutral | 0.068 | 0.062 | 4.309 |
| Other | 0.115 | 0.121 | 1.965 |
| S&P 500 | 0.210 | 0.131 | 1.604 |

Estimates based on data provided by MAR/Hedge.

[6] There are different ways to define the Sharpe ratio. In this study, we derive the Sharpe ratios by dividing the mean of the monthly returns by the standard deviation, or volatility, for each individual fund. A higher Sharpe ratio implies a better risk-return tradeoff for a particular fund. Since all the numbers in Table 1 are averages of the statistics for individual funds, the average Sharpe ratio cannot be derived by taking the quotient of the other two columns.

[7] Brown, Goetzmann, and Ibbotson, 1997, estimate similar survival rates for their sample of offshore hedge funds and for a different sample period. See their paper, "Offshore Hedge Funds: Survival and Performance, 1989-1995," NBER Working Paper 5909.

**Table 2**
**Survival of Hedge Funds**
**1994 -1998**

| | Global Macro | Global | Market Neutral | Other | Total |
|---|---|---|---|---|---|
| 1994 | 91.2% | 100% | 98.7% | 100% | 98.5% |
| 1995 | 68.4% | 94.7% | 93.6% | 71.7% | 85.4% |
| 1996 | 57.9% | 92.9% | 87.2% | 65.2% | 80.4% |
| 1997 | 42.1% | 76.5% | 79.5% | 63.0% | 67.0% |
| 1998 | 35.1% | 62.4% | 64.1% | 57.6% | 57.7% |

Estimates based on data provided by MAR/Hedge.

### 3. Market Impact, Positive and Negative

#### Providing liquidity to markets

Some hedge funds, as well as other market participants, undertake investment positions on the relative prices of related assets when the relative prices diverge from either historical norms or from the levels justified by fundamental macroeconomic considerations. These investors provide liquidity to markets because they buy and sell assets against prevailing market sentiment with the effect of mitigating temporary supply and demand imbalances. They buy the asset whose price has been driven down relative to the price of other related assets while selling the relatively overvalued asset.

Convergence or "arbitrage" trades are conducted in a variety of markets. One such market is the Treasury market where "arbitrage" trades smooth out price anomalies between similar Treasury securities issues.[8] This activity provides liquidity to other investors who benefit from the ability to buy or sell comparable Treasury securities at relatively uniform prices Another convergence trade when corporate debt yields are unusually high relative to the yield on government debt is the bet that the credit spread will fall back to historical levels. In this investment, the investor buys corporate debt and sells government securities. Such trading can reduce the volatility in corporate debt spreads, reducing the riskiness in the timing of corporate debt issuance.

Normally, convergence traders smooth anomalous variations in the prices of related assets. On rare occasions, these traders may choose to or be forced to withdraw from the markets.

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[8] In these trades, an investor constructs an estimated yield curve and buys Treasuries whose yield are above the curve while selling those whose yields are below the curve, on the conjecture that the anomalous yields will converge to the estimated yield curve. When this activity is conducted in sufficient volume, price anomalies quickly disappear.

When this occurs, the buying and selling pressures they otherwise would have absorbed or smoothed will immediately affect market prices. The market turmoil during late September and early October of 1998 was probably due, in part, to the withdrawal of convergence traders from the markets.

**Reallocation of financial risk and economic activity**

Hedge funds and other investors with high tolerance for risk play an important supporting role in a financial system in which various risks have been distributed across a broad spectrum of tradable financial instruments. With financial intermediation increasingly taking place in the capital markets instead of banking markets, prices play a larger role in the allocation of capital and risk. In this world, investors such as hedge funds that undertake a combination of long and short positions across markets help maintain the relative prices of related financial instruments.

Financial innovation over more than two decades has created a wide range of financial instruments with different types and degrees of risk. These instruments have unbundled the risks involved in financing real economic activity into distinct instruments that better match the preferences of investors. In doing so, they have most likely lowered the financing costs borne by the real sectors of the economy.

Alongside the innovation in financial instruments, specialization in the holding of risk has also emerged. Today's economy has moved away from the direct intermediation of credit where banks were the primary repositories of savers' wealth and channeled that capital to borrowers in the real sectors of the economy In that traditional world, all risks, such as interest rate risk, liquidity risk, and credit risk were bundled together in bank deposits, bank loans, and the bank itself. Today's financial system is vastly different from that world. A larger proportion of financial risks are held directly by investors in the form of tradable securities, with banks and securities firms increasingly acting as originators, market makers, or underwriters of those securities, instead of as investors or lenders.

While financial risks are now placed directly in the hands of investors in the form of traded securities, those securities are highly differentiated. The appetite for risk among investors varies widely, and forcing all investors to hold identical risks would drive up the cost of financing real economic activity. Thus, competitive forces have created specialized financial instruments and investment vehicles with different risk profiles. A key underpinning of the creation of lower risk securities is the willingness of some investors to hold the financial instruments in which the remaining risks have been concentrated. The activities of hedge funds and investors with a high tolerance for risk should be seen in the context of this reallocation of financial risks.

One example of the risk taking that supports this reallocation can be found in the interest rate swap market. That market has allowed lenders and borrowers with different attitudes towards interest rate risk to transfer the interest rate risk in the borrowing relationship to a third party through an interest rate swap contract, thus allowing better financing terms for the

borrower. The ability of the swaps market to perform this transfer of risk, however, depends on the stability of the link between the prices of interest rate derivatives and benchmark interest rates — for instance, the spread between interest rate swap rates and Treasury rates. This stability in turn depends on the willingness of speculators and arbitrageurs, such as hedge funds, to undertake convergence trades when swap spreads diverge from normal patterns.

Mortgage-backed securities provide another example of the role of specialization. Structured mortgage-backed securities have split apart the interest rate and prepayment risks embedded in residential mortgages and repackaged those risks into a collection of securities whose risks range from relatively low to extremely risky. By creating a highly risky security into which interest rate risk or prepayment risk has been concentrated, other less risky securities are created that provide a large share of the funding for the residential mortgage market. In the absence of investors who are willing to hold the risky tranches, mortgage originators would demand higher financing terms from borrowers because their ability to securitize mortgages would be impaired. Investors with high-risk appetites, such as hedge funds, are important participants in this reallocation of risk. If such investors were to disappear, mortgage interest rates would likely be higher.

**Recent studies of the impact of speculators on currency market stability**

Several recent empirical studies have looked at the impact of hedge funds on currency market dynamics to try to determine whether such investors can "move" these markets in directions favorable to themselves, either through their own actions or through the tendency of other market participants to follow their lead. The empirical results suggest that there is little evidence that they have done so in the episodes studied, although the data used to conduct these studies are limited.

An IMF Occasional Paper from May 1998 by Barry Eichengreen and others finds some evidence that hedge funds played a leading role in precipitating the ERM crisis in 1992 by acting as market leaders that other institutional investors followed, but that they did so in response to economic fundamentals.[9] In other episodes, notably the 1994 bond market turbulence, hedge funds as a group bet that interest rates would decline and lost substantial sums when they in fact rose. Studies of the role of hedge funds in the Mexican crisis in 1994-95 suggest that domestic residents, not international investors, played the leading role.

This study's analysis of the 1997 Asian crises indicates that hedge funds participated in the months before the crisis in the large increase in the carry trade (in which investors borrowed at low interest rates in major currencies and invested at higher interest rates in the East Asian countries) but that they were not the dominant players. As investors became worried about Thai

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[9] Barry Eichengreen and Donald Mathieson (with B. Chadha, A. Jansen, L. Kodres, and S. Sharma), *Hedge Funds and Financial Market Dynamics*, Occasional Paper No. 166 (Washington D.C.: International Monetary Fund, May 1998).

economic fundamentals and began selling the baht forward, the hedge funds also participated, but the available data suggest that they were at the rear of the herd of investors rather than in the lead. In addition, in the view of market participants, the baht was the only Asian currency for which the hedge funds' collectively took significant short positions.

A study by Brown, Goetzmann, and Park, reaches similar conclusions.[10] They find that, although hedge funds have often followed similar strategies since 1993 that sometimes increased their combined positions to significant levels, global hedge funds did not "move" exchange rates. They look in detail at the 1997 plunge of the Malaysian ringgit, finding that neither current nor one-month-previous ringgit returns vs. the U.S. dollar over the crisis periods can be explained by hedge fund positions. More generally, they find that there have been periods when the hedge funds have had very large exposures to Asian currencies, both positive and negative, but find no relation between these positions and current, past, or future movements in exchange rates.

[10] Stephen J. Brown, William N. Goetzmann, and James M. Park, *Hedge Funds and the Asian Currency Crisis of 1997*, NBER Working Paper No. 6427 (February 1998).