

# Hedge Funds and the Collapse of Long-Term Capital Management

Franklin R. Edwards

**F**or a time during fall 1998, hedge funds seemed to be on the front page of every newspaper in the world. Investors in some hedge funds had taken huge losses following the collapse of the Russian economy in August, and the Federal Reserve felt it necessary to organize a rescue of a hedge fund called Long-Term Capital Management. If the misadventures of a single wayward hedge fund with only about \$4.8 billion in equity at the start of 1998 could take the United States or even the world economy so close to the precipice of financial disaster that the Federal Reserve felt impelled to step in, what might happen if a number of hedge funds got into trouble? These events propelled hedge funds into the spotlight, with promises of congressional hearings and a forthcoming study of hedge funds by the President's Working Group on Financial Markets.

The purpose of this article is to demystify hedge funds and to explore the policy implications of the collapse of Long-Term Capital Management. What are hedge funds? What do they do? How are they regulated? What happened to LTCM? Did the Federal Reserve act prudently in engineering a rescue of LTCM? What are the policy and regulatory issues raised by the LTCM debacle?

## Legal and Organizational Structure of Hedge Funds

It is hard to imagine a greater misnomer than “hedge fund,” since hedge funds typically do just the opposite of what their name implies: they speculate. The term “hedge fund” was apparently first used in a 1966 *Fortune* magazine article which described the activities of a fund now commonly considered to be the first hedge fund (Loomis, 1966). That fund was started by a Columbia University sociologist

■ *Franklin R. Edwards is Professor of Economics and Finance, Graduate School of Business, Columbia University, New York City, New York. His e-mail address is (fre1@columbia.edu).*

turned fund manager, Alfred Winslow Jones, who in 1949 formed a general partnership to take long positions in what he viewed as undervalued securities, partially funded by taking short positions in overvalued securities, creating a leveraged exposure that was “market neutral” or “hedged” (Caldwell, 1995). Such a trading strategy, of course, is not what is generally meant by “hedging”; that is, it isn’t reducing the prospect of losses by taking on a counterbalancing transaction. Rather, it was a leveraged speculation on the performance of one type of security relative to another type of security, while attempting to immunize the portfolio from general market movements (or from systematic risk).

Although a hedge fund can be organized as a limited liability company, most are organized as limited liability partnerships established for the purpose of investing the money of their partners. The clear intent of the legal framework surrounding hedge funds is to limit them to wealthy and sophisticated investors who are capable of assessing the risks associated with hedge fund investments. As such, hedge funds are left mostly unregulated. In particular, they are exempt under sections 3(c)(1) and 3(c)(7) of the 1940 Investment Company Act if they have either fewer than 100 investors (or partners) or all of their investors meet the eligibility requirements for exemption under section 3(c)(7). Specifically, hedge funds may have an unlimited number of investors as long as all fund investors are “qualified purchasers” at the time of acquisition. “Qualified purchasers” are individuals with at least \$5 million in investments and institutions with at least \$5 million under management.<sup>1</sup> Hedge funds also are exempt from regulation under the Securities Act of 1933 because their securities are offered privately. However, a hedge fund with U.S. investors that trades futures and options on a futures exchange (as did LTCM) must register as a “commodity pool” under the Commodity and Exchange Act (CEA) and is subject to regulation as a commodity pool operator (CPO) by the Commodity Futures Trading Commission (CFTC) and the National Futures Association (NFA). At minimum, a CPO must file annual financial statements for its fund with the CFTC and the NFA, and must provide its investors with copies of those statements and with quarterly reports on the fund’s net asset values. It must also maintain books and records and is subject to the antifraud provisions of the CEA and to audit by the NFA.

As speculative vehicles for high net-worth individuals and institutional investors, hedge funds are free to hold whatever financial instruments they wish and to pursue whatever investment or trading strategies they choose. The key freedoms that hedge funds have, as opposed to regulated investment companies (mutual funds) and other institutional investors, are that hedge funds are not encumbered by restrictions on leverage or short sales and are free to take concentrated positions in a single firm, industry, or sector—positions that might be considered “imprudent” if taken by other institutional fund managers.<sup>2</sup> In addition, in keeping with

<sup>1</sup> A grandfather clause permits funds to carry up to 100 investors who are not “qualified purchasers” if they were investors in the fund as of September 1, 1996.

<sup>2</sup> Hedge funds, like all other stock traders, are subject to the “up-tick” rule (SEC rule 3b-3) for short sales, which prohibits a short sale at the last price unless that price is above the next preceding different price. In other words, a short sale can take place only when there is an “up-tick” in prices. The term

their wealthy clientele, hedge funds usually have high minimum-investment requirements; for example, Tiger Fund, one of the largest hedge funds, requires a \$5 million minimum (Pacelle, 1998a). Hedge funds also typically impose significant restrictions on the ability of their clients to withdraw funds, such as by permitting only quarterly or yearly redemptions, which gives them greater freedom to hold illiquid instruments. Finally, hedge fund fees are much higher than charged by most other institutional fund managers. The difference is not so much in administrative fees, which typically range from 1–1.5 percent of assets under management a year, nor in brokerage and trading expenses which all firms face. But hedge fund managers typically are paid large incentive fees—15 to 25 percent of net new profits—when returns exceed a specified “hurdle” return, providing those returns also are above a specified “high watermark.” The “high watermark” provision requires a fund manager who loses money to make up previous losses (or to exceed the fund’s previous maximum share value) prior to receiving an incentive fee (Goetzman, Ingersoll and Ross, 1998). The use of such incentive fees is sharply restricted for mutual funds and other institutional investors, for which the common fee structure is a flat “fraction-of-funds” fee (Das and Sundaram, 1998). LTCM, it should be noted, had some of the highest fees in the industry: an administrative fee of 2 percent and a 25 percent incentive fee (Pacelle, 1998b).

Thus, hedge funds are to a large extent the creation of the legal restrictions imposed on mutual funds and other institutional fund managers. Their advantage is that they can pursue investment and speculative strategies that are not open to other institutional fund managers, they can avoid the costs associated with regulatory oversight, and they can use whatever fee structure they believe to be optimal. The overriding goal of public policy underlying the regulation of institutional investment vehicles, such as mutual funds and pension funds, is “investor protection.” However, there is no obvious “investor protection” purpose to be served by the regulation of hedge funds. Hedge fund investors are wealthy, sophisticated individuals and institutions, who should have both the knowledge and clout to look after their own interests.

## The Hedge Fund Industry

It is difficult to obtain precise data about the activities, profits, or even the size of hedge funds. Hedge funds that are not also commodity pools have no regulatory obligation to disclose anything about their activities, portfolio holdings, or trading strategies. Almost half of all hedge funds are offshore funds, which are usually organized under the laws of such regulatory and tax havens as the British Virgin Islands, the Bahamas, Bermuda, the Cayman Islands, Dublin and Luxembourg. Because offshore funds provide tax advantages to non-U.S. investors (Brown, Goetzmann and Ibbotson, 1997, p. 6), most large hedge funds (such as LTCM) have both U.S. and offshore

---

“short sale” means any sale of a security which the seller does not own or which is consummated by the delivery of a security borrowed by the seller.

vehicles. However, there is no evidence from return characteristics or other data to believe that the investment activities of offshore funds are different from U.S. hedge funds (Liang, 1998). There are also hedge funds which only hold limited partnerships in other hedge funds, called “funds of funds.” These funds provide professional expertise in choosing hedge fund managers and allow investors to diversify across a spectrum of investment styles and managers.

Available information on hedge funds comes largely through voluntary disclosure by such funds to their investors and to commercial data vendors. The amount of information provided by hedge funds depends on what their investors demand, and on the relative bargaining power of the hedge fund managers. Fund managers who are in great demand, as was the case with LTCM, may be able to disclose very little about their activities—only monthly or quarterly performance figures. More typically, however, hedge fund investors demand and obtain extensive disclosure of their managers’ strategies, holdings and performance.

Most research and advisory firms estimate that hedge funds today manage over \$200 billion of client capital, an amount that may have doubled from the start of 1997 to the middle of 1998. The number of hedge funds is now believed to exceed 3000, compared to fewer than 1000 at year-end 1992 (Palmer, 1998; Pacelle, 1998a; McLean, 1998). This \$200 billion, of course, pales next to the trillion-dollar mutual fund industry; for context, the two largest mutual funds complexes, Vanguard Group and Fidelity, both have more investor funds under management than do all hedge funds taken together. However, hedge funds might nevertheless have a substantial impact on prices and markets through their ability to leverage their investments with large-scale borrowings and derivatives.

Table 1 shows the number of hedge funds in existence at the beginning of 1989, when there were relatively few such funds, up until 1996, before the vast expansion and turmoil of the last few years. These data were provided to the author by Managed Accounts Reports (MAR), one of the largest vendors of hedge fund data. In November 1998, the MAR data base included about 1300 of the estimated 3000 hedge funds that existed at that time, accounting for about two-thirds of the total funds managed by hedge funds. The MAR data include most of the large hedge funds; thus, the average size of the hedge funds included in the MAR data is about \$92 million, compared to an average of less than \$30 million for the hedge funds omitted from the data base. About 40 percent of MAR hedge funds are U.S. funds; the remainder are foreign.

Table 1 highlights the substantial entry and exit that occurs in the hedge fund industry. In the 1989–96 period, 1308 new hedge funds were formed, and 36.7 percent of all funds that existed at some time during this period no longer existed at year-end 1996. Attrition rates for foreign-based hedge funds are even higher—above 50 percent. An examination of the life cycle of all hedge funds in the sample since 1989 reveals that the average life span of a hedge fund is 40 months; the median is 31 months. Fewer than 15 percent of funds last longer than six years, and 60 percent disappear within three years. While funds may cease to exist (or voluntarily dissolve) for many reasons, poor performance appears to be a major causal factor. Exiting funds underperform the average hedge fund by about 1 percent a month during the year immediately preceding exit (Brown, Goetzman and

Table 1  
**Hedge Fund Attrition Rates, 1989–96**

	<i>Funds Existing at 1/1/89</i>	<i>New Funds Formed During 1989–96</i>	<i>Total Funds in Existence During 1989–96</i>	<i>Funds Existing at 12/31/1996</i>	<i>Funds Disappearing During 1989–96</i>	<i>Attrition Rates col. 5/col. 3</i>
US Hedge Funds	46	511	557	420	137	24.6%
Non-US Hedge Funds	81	539	620	281	339	54.7%
US Funds of Funds	11	118	129	105	24	18.6%
Non-US Funds of Funds	5	140	145	112	33	22.8%
All Funds	143	1308	1451	918	533	36.7%

*Source:* The data used to prepare this table were provided by Managed Accounts Reports.

Park, 1997). In the 1989–96 period, the average annual return of “surviving” hedge funds is 18 percent versus 10.5 percent for “non-surviving” funds.

An implication of the high hedge fund attrition rates is that the figures on the returns of hedge funds commonly reported by commercial data vendors may be inflated because of a “survivorship bias.” In particular, commercially available databases commonly do not provide the performance histories of funds that have ceased operations and which generally have poorer performance, but report data for only surviving funds. An analysis of the returns of surviving versus non-surviving funds suggests that, by reporting only the returns for surviving hedge funds, commercially available figures for annual hedge fund returns may be inflated by as much as 1.9 percentage points (Edwards and Liew, 1999).

## Why Have Hedge Funds Grown?

The growth of hedge funds is attributable to two factors: the demographics of potential hedge fund investors and the attractive performance of hedge funds. About 80 percent of hedge fund investors are high net worth individuals, and the number of such individuals has grown sharply in the last decade, due to what will soon be a two-decade bull market in stocks. It has been estimated that there are now six million millionaires in the world, holding some \$17 trillion in assets (McLean, 1998, p. 182). The remaining 20 percent of the hedge fund customer base is institutional investors such as university endowment funds and pension funds, which are showing an increasing interest in hedge funds. For example, the \$30 billion Virginia Retirement System has allocated \$1.8 billion of its funds to six long/short hedge fund managers and \$150 million to a non-U.S. equity hedge fund manager (Palmer, 1998, p. 40). If institutional investors come to see hedge funds as an attractive investment vehicle, the growth of such funds could accelerate sharply.

What investors apparently expect from hedge funds are not only double-digit

annual returns, but very little correlation between those returns and the returns on stocks and bonds. In the 1990s, hedge funds have delivered on those expectations. In a recent study which I updated for this article (Edwards and Liew, 1999), I examine the monthly returns (after all fees) of more than 1,500 hedge funds over the period 1989 through August 1998, which includes some of the worst returns that hedge funds have ever experienced. These data, which were provided by Managed Accounts Reports, include returns for both surviving and non-surviving funds—funds that ceased to exist during the period, so that estimated returns are not subject to the survivorship bias discussed earlier. To compare hedge fund returns to returns on other traditional asset classes, I formed equally-weighted and value-weighted portfolios of all hedge funds in the data and compared the monthly returns on these portfolios with those on stock and bond portfolios over the 1989 through August 1998 period.<sup>3</sup> An equally-weighted hedge fund portfolio had an average annual return of 14.23 percent, while a value-weighted portfolio had an average annual return of 18.30 percent. Over the same period, the Standard and Poor's 500 stock index and the Russell 2000 index had average annual returns of 16.47 percent and 12.55 percent, respectively, and long-term corporate bonds returned 10.39 percent a year. Thus, despite the substantial losses suffered by hedge funds during the summer of 1998, the returns of hedge funds have been impressive, especially given the almost unequaled bull market that we have had in stocks during this period.

A further characteristic of many hedge funds, that has been critically important to attracting investors, is the low correlation that their returns have had with the returns on traditional stock and bond portfolios. Investors can by including hedge funds in their portfolios obtain significant diversification benefits. Returns on a value-weighted portfolio of hedge funds from 1990 through August 1998, for example, had only a 0.46 correlation with Standard and Poor's 500 returns and only a 0.38 correlation with long-term corporate bond returns. However, using an aggregated portfolio of hedge funds can hide important aspects of hedge fund returns. Hedge funds employ vastly different trading strategies, and therefore have very different correlations with bond and stock investments. For example, hedge funds pursuing a "short-selling" strategy will have a zero or negative correlation with stock returns, while those pursuing a "value" strategy will have a high positive correlation with large-cap stock indexes. Nevertheless, about 50 percent of hedge funds have returns which are less than 0.29 correlated with the returns on Standard and Poor's 500 stock index. Thus, during the 1990s, many hedge funds have been able to provide both high returns and large diversification benefits.<sup>4</sup>

The attractive returns delivered by hedge funds raise the obvious question of what they do to generate those returns, and of whether they can continue to

<sup>3</sup> New equal-weighted and value-weighted portfolios are formed every month, which implicitly assumes that investors are able to costlessly re-balance their portfolios each month to maintain the required portfolio weights. Value-weighted portfolios are weighted every month by the amount of money a hedge fund has under management.

<sup>4</sup> It is not clear that the correlation between hedge fund returns and stock and bond returns would be as low in a declining stock market. During the summer of 1998, when both stock and bond returns fell sharply, hedge fund returns also fell sharply.

produce high returns in the future. The question of what hedge funds as a group do is difficult to answer, because, not surprisingly, individual hedge funds engage in very different activities. Industry practitioners commonly classify funds according to their stated investment styles or strategies, although there is no unanimity on how best to classify them (Palmer, 1998, p. 46; Brown, Goetzman and Ibbotson, 1997; Fung and Hsieh, 1997). “Macro” funds bet on the direction of certain macroeconomic variables, such as the direction of a particular exchange rate. “Distressed securities” funds bet on particular bankruptcies occurring. “Market neutral” funds simultaneously buy securities that they see as relatively cheap and sell securities they consider overpriced, aiming to profit no matter what happens to the overall level of macro variables like stock market levels or interest rate levels. Even hedge funds pursuing a similar style or strategy may have very different risk exposures and returns because of the amount of leverage they choose to employ or the particular instruments they utilize (Liang, 1998).

However, taking into account the different approaches and strategies of hedge funds, there are three possible explanations for their high returns. First, hedge funds may be exploiting price inefficiencies that exist, especially in foreign markets. Second, hedge fund managers as a whole may possess superior skill, perhaps because the incentive fee structure used by hedge funds has enticed money managers with the greatest skill to hedge funds. Finally, perhaps the high returns earned by hedge funds simply reflects the large risks that they take. If these risks were properly accounted for, maybe hedge fund returns would no longer appear to be unusually high. Let us consider these possibilities in turn.

Even staunch believers in efficient markets will readily admit that price inefficiencies may exist when regulations restrict the flow of capital into particular financial sectors or into particular investment strategies. For example, the short-sale portfolio restrictions imposed on institutional money managers may create an opportunity that hedge funds can exploit. More broadly, relaxation of capital controls throughout the world has opened emerging economies to new capital flows. Markets in many of these countries are in a relatively primitive state, so that price inefficiencies may exist that hedge funds can capture. However, if past hedge fund returns were dependent on exploiting such inefficiencies, we can expect hedge fund returns to decline as the hedge fund industry expands and markets mature and become more efficient.

The evidence on the second theory, that high hedge fund returns are due to superior fund manager skill, is scanty at best. As noted earlier, hedge funds pay managers large incentive fees. The intended purposes of this fee structure are to attract superior fund managers and to align the interests of these managers and investors. Whether an incentive fee actually succeeds in aligning these interests is not clear. While large incentive fees do give fund managers a large and immediate share of the profits, they may also result in managers adopting a “recklessly risky” strategy in the hopes of pocketing a large incentive fee if things go well (Chevalier and Ellison, 1997; but see Das and Sundaram, 1997). This risk will be particularly vivid if failing managers are not sufficiently penalized for their poor performance, perhaps by becoming unemployable as a fund manager. Probably because it is unclear whether the “market” enacts such

punishments effectively, investors commonly require that hedge fund managers put a substantial amount of their own wealth in the fund. Such requirements may explain why we do not observe “losing” hedge fund managers increasing the riskiness of their trading strategies after experiencing substantial losses, despite a clear incentive to do so (Brown, Goetzman and Park, 1997), and why attrition rates are so high in the hedge fund industry (remember, 60 percent of hedge funds disappear within three years). Since managers of poorly performing hedge funds cannot expect to receive incentive payments until previous high watermarks are surpassed, they may simply close “underwater” funds which don’t promise to pay large incentive fees and start new ones.

Despite this incentive fee structure, there is little empirical evidence on whether hedge fund managers do indeed have greater skill, partly because good data are hard to come by and partly because there is no agreement on how to categorize and define managerial skill separate from other factors. For example, Brown, Goetzman and Ibbotson (1997) find some evidence of skill based upon an analysis of the persistence in the returns among hedge funds. But the persistence in returns disappears when “style” effects are taken into account, or when hedge funds are separated and analyzed by sector and/or investment strategy (Fung and Hsieh, 1997). Did the successful managers skillfully choose their sectors and strategies? Or did managers of equal skill choose different sectors and strategies by chance, and some sectors or strategies just worked out better than others? Until better data are available, we must withhold judgement about whether hedge fund managers are more skillful than other money managers.

The third hypothesis, that hedge funds have higher returns because they take greater risks, appears at first glance to be inconsistent with the evidence. For example, the returns of hedge funds are not obviously more volatile than stock returns. I find that for the period 1989 through August 1998, which includes some of the worst returns that some hedge funds have ever experienced, the annualized standard deviations of monthly returns for equally-weighted and value-weighted portfolios of all hedge funds are, respectively, 5.75 percent and 8.94 percent. The corresponding standard deviations in the same period for large-cap stocks (the Standard and Poor’s 500 index) and for small-cap stocks (the Russell 2000 index) are 13.20 percent and 16.64 percent respectively.

Hedge funds have high risk-adjusted returns by conventional measures. Financial economists, as well as practitioners, commonly use “Sharpe ratios” to compare different investments on the basis of risk-adjusted returns. The Sharpe ratio is the ratio of the excess return on an investment—measured as the returns over and above the returns on riskless Treasury bills—to the volatility of the returns on that investment—measured as the standard deviation of returns. An asset with a higher Sharpe ratio is considered to have a higher risk-adjusted return. Hedge funds have impressive Sharpe ratios. From 1989 through August 1998, equally-weighted and value-weighted portfolios of all hedge funds had Sharpe ratios of 1.58 and 1.47 respectively, almost double the 0.86 Sharpe ratio for the S&P 500 stock index during the same period.

But even this evidence does not settle the argument because there is an absence of

unanimity about how to adjust hedge fund returns properly for risk. Using another common measure of an asset's risk-adjusted returns, the "Jensen alpha," which is the amount by which the average return on the asset exceeds what would be predicted by the capital asset pricing model (or after adjusting for the asset's systematic risk relative to stock market returns), Edwards and Liew (1999) find that during 1989 through 1996, 40 percent of hedge funds had positive Jensen alphas—or returns that exceeded what would be expected on the basis of an adjustment for systematic risk. But this evidence of excess returns largely disappears when the basic capital asset pricing model is expanded to include additional risk factors which have been proposed by some financial economists, such as the "book-to-market" effect, a "size" effect, and a "momentum" effect (Carhart, 1997). In particular, when those factors are added to the standard pricing model, creating a "four-factor" capital asset pricing model, a time series analysis of average hedge fund returns no longer produces significantly positive Jensen alphas (Edwards and Liew, 1999). Thus, without clear agreement on how to adjust hedge fund returns for the appropriate risk factors, it seems premature to conclude that they have earned excess returns.

Of course, it may also be that the high hedge fund returns observed during the 1990s do not represent the long-run returns we can expect from hedge funds, but simply reflect the favorable economic conditions that existed during this period. A 10-year period is a short history when it comes to predicting future returns on a financial asset.

In sum, lack of detailed knowledge about what hedge funds do, as well as the short history we have of hedge fund returns, prevents drawing firm general conclusions about either the sources of their returns or about the likelihood that they will continue to earn high returns in the future. Nonetheless, through most of the 1990s, hedge funds have successfully provided an attractive speculative vehicle for wealthy investors largely without controversy or public policy incident. In August 1998, the near-collapse of a single hedge fund, Long-Term Capital Management LP, changed all this. What follows is the story of the LTCM debacle and why the collapse of LTCM has put fear in the hearts of both the financial community and regulators.

## **The Collapse of Long-Term Capital Management**

Long-Term Capital Management was formed in February 1994 with equity of \$1.3 billion. Somewhat over \$100 million of this money was the contribution of the LTCM's general partners. LTCM required a minimum investment of \$10 million, and no withdrawals for three years. In addition, its fees were an annual charge of 2 percent of assets, and 25 percent of new profits (Siconolfi, 1998). The fund returned 19.9 percent after fees in 1994 to its investors, 42.8 percent in 1995, 40.8 percent in 1996, and another 17.1 percent in 1997. By late 1997, the equity in LTCM had grown to over \$7 billion. In December 1997, however, the fund returned \$2.7 billion to its investors, claiming diminished investment opportunities, leaving equity of about \$4.8 billion at the start of 1998.

LTCM was primarily engaged in what hedge fund practitioners call "market-neutral arbitrage." Its main holdings appear to have been long positions in bonds

that it considered undervalued and short positions in bonds that it considered overvalued. More specifically, it bought (or entered into derivatives contracts that replicated buying) high-yielding, less liquid bonds, such as Danish mortgage-backed securities, bonds issued by emerging market countries, and “junk” corporate bonds, and sold short (or entered into derivatives contracts that replicated selling) low-yielding, more liquid bonds, such as U.S. government bonds. LTCM believed that in late 1997 and early 1998, partly as a consequence of the collapse of Asian countries in the summer of 1997, the yield spread between high and low risk bonds (or less liquid and more liquid securities) was excessively wide—for example, the spread between high-yield corporate bonds and U.S. Treasuries was nearly 4 percentage points in January 1998—and that this spread would narrow as investors reassessed the risks.

Even a small reduction in yield spreads would mean huge profits for LTCM because of its enormous leverage. With its roughly \$5 billion in equity at the start of 1998, LTCM reportedly borrowed more than \$125 billion from banks and securities firms. This more than 20-to-1 leverage ratio, high by any standard, was unusual even for hedge funds. A third of hedge funds reportedly do not borrow at all, and, of those that do borrow, 54 percent borrow no more than the amount of equity their investors put in the fund. Of those that borrow more, it is rare that leverage exceeds ten to one (“Turmoil in Financial Markets,” 1998).

LTCM also stood to gain or lose a lot if yield spreads changed because of the large number of derivatives contracts it held. For example, LTCM entered into interest rate “swaps” in which it agreed to make periodic (quarterly or semi-annually) payments to its contractual counterparty (or swap counterparty) if yield spreads between LIBOR-based instruments and government bonds widened, but would receive payments from its counterparty if yield spread on bonds narrowed. The size of the periodic payments made in a swap, like other derivatives contracts, is largely determined by the “notional” size of the contract. If the parties to the contract want the payments to be large even for small changes in yield spreads, they set a large notional value, such as \$100 million. In this case the gains and losses on the swap contract essentially replicate what would be the gains and losses on a \$100 million spread position in the securities themselves. One advantage of an interest rate swap, of course, is that you do not need to have money to buy or sell the securities in the cash market. At the start of 1998, the notional value of LTCM’s derivatives contracts was in excess of \$1 trillion: \$697 billion in swaps and \$471 billion in exchange-traded futures contracts. Thus, LTCM stood to make substantial profits if yield spreads narrowed, but even a small widening of spreads could quickly wipe out its equity.<sup>5</sup>

<sup>5</sup> LTCM used leverage to multiply the potential profits (and losses) of many otherwise relatively safe investments. For example, it bought large amounts of the higher-yielding “on-the-run” (newly-issued) 30-year U.S. Treasury bonds and shorted equal amounts of the lower-yielding “off-the-run” 29-year U.S. Treasuries, betting that the yield differential between the two would soon disappear. While the yield spread, and therefore the potential profits associated with this strategy are typically very small, LTCM was able to substantially increase the potential profitability by leveraging up these positions 30 to 40 times (Lenzner, 1998).

LTCM's vulnerability to widening yield spreads was exacerbated because some of its portfolio consisted of illiquid financial instruments with no ready market, and in some cases it was a substantial holder of these instruments. Thus, in the event that yield spreads moved against it, any attempt by LTCM to contain its losses by liquidating its positions would put heavy pressure on prices and expose LTCM to even larger losses. Clearly, LTCM was very confident that yield spreads would not widen significantly.

Presumably, LTCM was able to borrow such large amounts and enter into such large swaps contracts with so many parties, who could be owed a lot of money by LTCM if yield spreads were to change significantly, because of its sterling track record of returns over four years and because of the nearly unequaled reputation of its general partners, which among the 16 general partners included John Meriwether, formerly head of bond trading at Salomon Brothers; David Mullins, the former vice chairman of the Federal Reserve Board; Myron Scholes and Robert Merton, who both won Nobel prizes for their work in the pricing of financial instruments; and a host of star fixed-income traders who formerly worked at Salomon Brothers.

By spring 1998, however, the unthinkable began to occur. The Asian financial collapse festered on, and concerns arose that similar problems could spread to other emerging market countries. The bond-trading desks of banks and securities firms began to unload their risky, illiquid bond positions. Within a few months, there was virtually no market (or bids) for junk bonds, as buyers disappeared and yields on high-risk bonds soared. The *coup de grace* came on August 17, 1998, when Russia devalued the ruble and declared a moratorium on 281 billion rubles (\$13.5 billion) of its Treasury debt. Derivatives contracts between private parties commonly include a *force majeure* clause that permits the parties to the contract to terminate the contract without performance when an event occurs that has a pervasive effect on markets and makes performance of all contracts impossible without enormous loss to the contractual counterparties. Russian banks and securities firms apparently exercised these provisions, and refused to honor the derivatives contracts they had sold to customers wishing to hedge the currency risk in their debt positions in Russian Treasury bonds.

As fear spread of what the market repercussions to these market breakdowns might be, there was a stampede to "quality." Investors everywhere tried to unload high-risk, illiquid securities and replace these with low-risk, liquid securities. By September 10, 1998, yields on emerging market debt as shown by the J. P. Morgan emerging market bond index had risen to a spread of 17.05 percentage points above the return on comparable U.S. Treasury bonds, up from a 6 percentage point spread in July and a 3.3 percentage point spread in October 1997. Similarly, yields on U.S. B-rated bonds rose to almost 11 percent, a spread of 5.7 percentage points above high-rated corporate bonds, up from a spread of about 2 percentage points (Morgenson, 1988; Fuerbringer, 1998). This sharp widening of yield spreads caused by a stampede to liquidity and quality was just the opposite of what LTCM was betting on. By mid-September 1998, LTCM's equity had dropped to \$600 million, a loss of more than \$4 billion.

News that LTCM and possibly other hedge funds were in trouble because of their huge bets on a narrowing of yield spreads set off alarm bells throughout the financial community. These funds, under pressure to meet margin calls and to

provide more collateral to creditors and swap counterparties, might be forced to sell their large holdings at any price, which could collapse the value of these securities. Many banks and securities firms also held in their own trading accounts large amounts of similar securities to those held by LTCM, so that if the prices of those securities collapsed they too would suffer substantial losses (“Turmoil in Financial Markets,” 1998). Finally, while detailed information remains unavailable, it seems almost certain that banks and securities firms also had a significant exposure as counterparties to LTCM’s swap positions.

In early September 1998, LTCM advised the Federal Reserve Bank of New York of its impending difficulties. During the next few weeks, Federal Reserve representatives organized meetings of LTCM’s creditors and met with LTCM partners to discuss the situation. On the evening of September 22, the president of the New York Federal Reserve Bank summoned more than a dozen top executives of the firms which had loaned money to LTCM to an 8 p.m. meeting and warned them that “the systemic risk posed by LTCM going into default was ‘very real’” (Siconolfi, 1998). The next day, a 16-member creditor consortium agreed to put in additional capital of \$3.625 billion in exchange for 90 percent of the remaining equity in LTCM; the consortium included Goldman Sachs, Merrill Lynch, J. P. Morgan, Morgan Stanley, Dean Witter, the Travelers Group, Union Bank of Switzerland, Barclays, Bankers Trust, Chase Manhattan, Credit Suisse First Boston, Deutsche Bank, Lehman Brothers, Paribas, and Societe Generale.<sup>6</sup> By the end of September 1998, the stakes of the 16 general LTCM partners were reportedly worth about \$30 million, down from \$1.6 billion earlier in the year.

## **Policy Implications of the LTCM Rescue**

The near-bankruptcy of LTCM and its rescue by a creditor consortium organized by the Federal Reserve raise three broad sets of policy issues. Did the Federal Reserve act prudently in organizing LTCM’s rescue? Why were banks apparently so vulnerable to an LTCM default, and was there a breakdown in the regulation and supervisory oversight of banks? Does the LTCM situation argue for additional hedge fund regulations of some sort?

<sup>6</sup> Less than 24 hours earlier, John Meriwether, LTCM’s managing partner, had turned down a \$4 billion cash offer by Warren Buffett, Goldman Sachs, and AIG, Inc. to take over LTCM that would have reduced the remaining stake of LTCM’s partners to just 5 percent and would have fired Meriwether. Meriwether claimed that he was unable to accept the Buffett offer because it did not allow sufficient time (he was reportedly given 45 minutes) for him to obtain the needed approvals (Siconolfi, 1998). In particular, LTCM’s numerous counterparties would have had to agree to an assignment of their derivatives contracts to the Buffett group, and LTCM would have had to cash out its investors at what could have been viewed as an artificial net asset value. Whether these were the real reasons for Meriwether’s refusal, or he was just playing “chicken” with the New York Fed, we may never know. In any case, by not having to take the Buffett offer, LTCM partners were made substantially better off. Since the creditor bailout, LTCM is reported to have made profits of more than \$700 million, and the old partnership that still runs LTCM stands to collect year-end fees of as much as \$50 million (Pacelle, 1998b).

### **Did the Federal Reserve Act Prudently in Organizing LTCM's Rescue?**

Federal Reserve officials believe that in acting quickly to resolve the LTCM situation they avoided the risk of what could have been a systemic meltdown in the global financial system. Alan Greenspan (1998, pp. 1, 5) testified before Congress: “[T]he act of unwinding LTCM’s portfolio in a forced liquidation would not only have a significant distorting impact on market prices but also in the process could produce large losses, or worse, for a number of creditors and counterparties, and for other market participants who were not directly involved with LTCM. . . . Had the failure of LTCM triggered the seizing up of markets, substantial damage could have been inflicted on many market participants . . . and could have potentially impaired the economies of many nations, including our own.”

Why did Federal Reserve officials believe that the losses of a single hedge fund could destabilize global financial markets? Two factors appear to have dominated their thinking. First, the Federal Reserve believed that financial markets already were in a fragile state, which raised the risks of inaction. As Greenspan (1998, p. 1) put it: “The plight of LTCM might scarcely have caused a ripple in financial markets or among federal regulators 18 months ago. . . . With credit spreads already elevated and the market prices of risky assets under considerable downward pressure, Federal Reserve officials moved more quickly to . . . resolve the affairs of LTCM than would have been the case in more normal times. In effect, the threshold of action was lowered by the knowledge that markets had recently become fragile.” Both at the time and in retrospect, this fragility seems unmistakable and troubling. Following the Russian default, investors almost overnight demanded what seemed like inexplicably high risk premia for all emerging markets securities, even those not much connected with Russia. For example, the huge spreads demanded by investors on Venezuelan government bonds in September 1998 implied a 99.9 percent probability of default by the Venezuelan government within two years—an assessment of risk that hardly seemed in line with the actual economic and political situation of Venezuela (“Why Risk is a Four-letter Word,” 1998). It may be that lenders attempted to rebalance their portfolio risk by shedding high-risk securities generally, including other emerging market debt (Calomiris and Wilson, 1998), and the result was a breakdown in the trading of high-risk financial instruments generally.

The second major factor in the Fed’s thinking was that because of LTCM’s involvement with derivatives contracts, it was important to avoid a formal default by LTCM—or formal bankruptcy proceedings. Typically, in bankruptcy the law provides for the automatic stay of the firm’s assets, which prevents individual creditors from disposing of assets under their control to gain an advantage over other creditors. However, LTCM’s situation was different because of its huge derivatives positions. Derivatives contracts are given a statutory exception to the automatic stay provisions contained in the relevant bankruptcy code. In particular, derivatives contracts, such as swaps, have clauses that give parties the right to terminate the contract in the event of a default of any kind by a counterparty. In the event of such default and termination, counterparties have the right to liquidate any of the defaulting counterparties’ assets that they have in their control for any reason, even

assets that are not directly related to the derivatives contracts in question. By August 1998, bond prices had moved sharply against LTCM so that its derivatives counterparties were threatened with large potential losses if LTCM failed to make good on its future payments under those contracts. In derivatives markets, contractual counterparties rely on mark-to-market valuation principles coupled with periodic margin payments or calls for additional collateral to minimize their exposure to credit risk, or to non-payment by a counterparty. Given this institutional structure, any default by LTCM would have caused all derivatives counterparties to terminate their contracts with LTCM and to liquidate whatever assets they had under their control. (Not to have done so would have been to risk even greater potential losses.) Thus, the Federal Reserve's actions were directed at preventing the wholesale liquidation of LTCM's positions by rescuing LTCM before it defaulted on any of its obligations. Had the creditors put LTCM into formal bankruptcy, they could not have stopped this wholesale liquidation.

The potential fallout from a wholesale liquidation of LTCM's positions, had that occurred, was threefold. First, a "funnel" effect might have occurred if all parties tried to liquidate their positions with LTCM at the same time. As they all ran for the door, very few would get through before prices collapsed—especially since LTCM's positions constituted a sizeable portion of the total outstandings in some assets. Second, when the prices of LTCM's assets plummeted, there could have been a serious "knock-on" effect because some banks and other financial firms (such as other hedge funds) were holding positions similar to LTCM's. They too would have suffered substantial losses, which could have triggered additional defaults. Third, the widespread liquidation of LTCM's positions together with the knock-on effect would have caused significant price changes which, through a "chain reaction" in derivatives markets, could have inflicted substantial losses on LTCM's counterparties, possibly causing them to have to default on their obligations to other parties. In particular, LTCM's counterparties may not have been able to make payments on other derivatives contracts that they entered into as a hedge against their LTCM positions. This could have led to additional liquidations of assets as parties scrambled to collect what they were owed. From the perspective of these concerns, the Fed simply played a role similar to that of a trustee in bankruptcy in a situation where a gap in the existing bankruptcy laws did not enable creditors and counterparties to institute an orderly bankruptcy and liquidation proceeding that was in all of their interests.

In the scenario of wholesale liquidation, the fallout from LTCM might have directly threatened the solvency of some major banks and securities firms. Banks and securities firms were major lenders to LTCM, and almost certainly were also the major derivatives counterparties to LTCM (and probably other hedge funds as well). They also appear to have been holding in their own trading accounts many of the same positions held by LTCM and other hedge funds. Even if outright insolvencies could have been avoided, the Federal Reserve may have feared that the result could still have been a credit crunch that might threaten the U.S. economy and possibly worsen the Asian deflation problem (Bernanke, 1983; Bernanke and Lown, 1991).

The difficult issue raised by the LTCM rescue is whether the Federal Reserve's

actions constitute an undesirable extension of the federal safety net to certain bank *customers*, perhaps including any large financial firm or speculator threatened with insolvency. Such a policy would clearly be undesirable, because the presence of government protections and bailouts can create a serious moral hazard problem; that is, it can encourage excessive risk-taking that makes these protections and bailouts even more necessary and costly, as occurred in the collapse of the savings and loan industry in the 1980s. Policies for fighting forest fires provide an apt analogy. While quickly containing and extinguishing all fires may seem like a good idea at the time, the result of such a policy is that it allows a build-up of combustible material on the floor of the forest. After a time, as the combustible material accumulates, it becomes much harder to put fires out, so that fires spread quickly over larger areas and impose huge losses. Financial markets may have these characteristics as well—quickly bailing out creditors and investors makes markets more fragile in the long-run, so that when a market fracture occurs, it becomes even more difficult to contain the damage. Regulators have an obvious bias to intervene to prevent real and imagined crises on their watch, even if the long-term consequences pile up because of greater risk-taking.

To understand the potential force of this moral hazard argument, consider the troubling possibility that the reason why the Russian default led to a worldwide flight from all emerging markets and risky bonds is that the default may have punctured a moral hazard bubble. Prior to Russia's default, international creditors and investors had observed IMF and U.S. assistance to Mexico, Korea, Indonesia, and other troubled countries. They may well have believed that major western countries and the IMF would not permit a default by a major country, like Russia, to occur. When Russia did default, investors then reduced their holdings of emerging market debt and demanded higher risk premiums generally. While the importance of this "moral-hazard bubble" view is admittedly hard to establish, recent events should at minimum dramatize the danger that an IMF or U.S. policy of consistently bailing creditors and investors out of collapsing economies threatens to make markets more fragile in the long-run.

Although Federal Reserve assistance to nonbank financial institutions and firms is rare, it is not unprecedented. When Penn Central went into bankruptcy in 1970, the Federal Reserve was concerned that Penn Central's default on its commercial paper would disrupt the commercial paper market. The Fed directed banks to freely lend to firms unable to roll over their commercial paper, and indicated that credit through the discount window would be available to all banks making these loans (Mishkin, 1990, p. 98). Similarly, during the October 1987 stock market crash, the Federal Reserve encouraged banks to lend to brokerage firms experiencing a liquidity squeeze because of massive margin calls that threatened to put the clearing and settlements system into gridlock. Again, the Federal Reserve made it clear that it would open the discount window to all banks making such loans. Arguably, however, these very occasional Federal Reserve interventions directed at assisting nonbank institutions have not expanded the federal safety net.

Anticipating criticism of its actions in the LTCM case, Federal Reserve officials have taken pains to argue that no government "bailout" occurred. In the words of

William McDonough (1998, p. 8), president of the New York Federal Reserve Bank: “[N]o Federal Reserve official pressured anyone, and no promises were made. Not one penny of public money was spent or committed.” In addition, the Federal Reserve-engineered creditor-rescue of LTCM did require creditors and investors (including LTCM’s principals) to take substantial losses, although these losses were probably somewhat less than they would otherwise have sustained. We are told that Federal Reserve officials merely “supplied office space” for meetings and perhaps “some guidance.” Despite these protestations, it is difficult to accept the notion that a Federal Reserve presence at creditor meetings was incidental to these proceedings and was not implicitly coercive.

Perhaps the more honest case for Fed intervention in LTCM would not pretend that the Fed was merely an interested bystander, but would simply argue that it was the best way for regulators to intervene in this situation. Had LTCM not been rescued, and had the solvency of banks and securities firms been threatened due to a fire-sale liquidation of LTCM’s positions, then regulators would have had to decide between relaxing capital standards, at least in the short run, and forcing the closure or re-capitalization of some large institutions. By engineering the rescue of LTCM, the Federal Reserve was able to protect all of LTCM’s counterparties and creditors in one fell swoop.

The Federal Reserve did have a ready alternative to “providing office space” for the creditors to organize themselves. It could have adhered to traditional central bank lender-of-last-resort principles; that is, making credit freely available on the basis of good collateral and at a penalty rate, under pre-negotiated and known terms and conditions (Mishkin, 1994). In fact, as part of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991 (sections 131–33 and 141–42), Congress expanded the power of the Federal Reserve to provide discount window assistance to nonbank firms (both financial and otherwise), on the basis of collateral terms similar to those that apply to bank borrowing. The lender-of-last-resort approach imposes higher costs on those who take imprudent risks, creates incentives for banks and other market participants to make behavioral and structural changes that ultimately make financial markets less fragile, and thus narrows the moral hazard risk associated with expanding the scope of the federal safety net.

Would this traditional lender-of-last-resort approach have failed in the case of LTCM’s collapse? Probably not. Was the lender-of-last-resort approach the most efficient way for the Federal Reserve to provide assistance? Almost certainly not. Will the Federal Reserve’s intervention in the LTCM rescue, if not repeated in other guises, expand the moral hazard problem more than alternative policies, like relaxation of bank capital standards in times of financial stress? Probably not.

### **Bank Regulation and Derivatives Markets**

How could banks and securities firms have loaned so much money to LTCM and taken such large counterparty risks *vis-à-vis* LTCM without knowing more about what LTCM was doing? Everything we know about LTCM suggests that it did not provide creditors and counterparties with enough information for them to evaluate their exposures; for example, they did not know the details of LTCM

trading strategies, and they appear not to have had a complete picture of the extent of LTCM's borrowings and derivatives positions. They chose to extend credit and trade with LTCM without this information. Indeed, the one thing that they did know about LTCM was that it was a hedge fund whose sole activity was speculation, and that the purpose of the credit made available to LTCM was to facilitate LTCM's speculative bets. At a minimum, it certainly appears that banks and securities firms either did not press for the information they needed or, if they had this information did not use it to evaluate the risks associated with LTCM. As such, LTCM raises the disturbing prospect that neither bank owners, nor depositors, nor bank regulation, has kept banks from taking imprudent risks.

The LTCM debacle raises a number of bank regulatory issues that are so fundamental that they effectively reopen the debate about whether the present bank regulatory system is flawed in some fundamental way. If Greenspan is correct that the Fed's assistance in rescuing LTCM was necessary to prevent markets from "seizing up" and "impairing the economies of many nations," this can hardly be seen as a ringing endorsement of the present bank regulatory system. This system relies on net worth and portfolio requirements coupled with early regulatory intervention to overcome the adverse incentive problems created by deposit insurance and other government support and guarantees available to banks. In the case of LTCM, this system apparently did not work well enough—in the view of the Fed—to insulate some large banks from the collapse of a single hedge fund.

The urgency with which the Fed viewed an LTCM default is also inextricably bound up with the operation of derivatives markets, which have grown quite substantially in the last few years. Derivatives instruments can be divided into those traded on exchanges, like futures contracts, and those traded off exchanges, like swaps and many options contracts. The operation of the off-exchange derivatives market is central to the LTCM controversy. Trading in these markets is concentrated in the hands of a small number of banks and securities firms; indeed, the ten largest bank dealers are counterparties in almost half of all the contracts (Barboza and Gerth, 1998). The fear is that if one or more of these dealer/banks were either to fail or to withdraw from trading as a consequence of a counterparty default, the result could be a chain reaction of defaults possibly ending in a systemic breakdown. The U.S. General Accounting Office (1994) conducted a study of off-exchange derivatives markets and concluded that these markets may pose a systemic risk to financial markets and that additional regulation may be needed to safeguard the financial system.

In particular, to lessen the risk of a systemic collapse, proposals have been made to increase transparency in off-exchange derivatives by creating a clearing association for off-exchange derivatives, such as swaps, similar to the clearing associations in place for exchange-traded derivatives, such as futures contracts (Edwards, 1983). However, I have argued that there is nothing intrinsic about these markets that prevents them from operating prudently without a clearing association (Edwards, 1995). Instead, I would argue that what is needed is more effective regulation of the key players in this market, especially the banks and securities firms that serve as its primary market-makers.

At a minimum, we need to enhance the ability and the incentives of bank depositors, creditors and shareholders to discipline banks and securities firms for taking imprudent risks. The LTCM episode certainly suggests that bank disclosure practices concerning their arrangements with hedge funds and their derivatives and proprietary trading activities are inadequate. An especially egregious case of a link between a bank and hedge fund speculation was the unsecured loan for \$1.4 billion that BankAmerica made to D. E. Shaw, a hedge fund that it established as a joint trading venture with the provision that all profits and losses be divided (“American Banks,” 1998). On October 14, 1998, BankAmerica announced a \$372 million write down of the \$1.4 billion loan to D. E. Shaw, and a trading loss of \$529 million. To avoid booking further losses, BankAmerica took over D. E. Shaw’s \$20 billion bond portfolio, in effect bailing out Shaw. The full extent of BankAmerica’s losses on this portfolio will not be known for some time. At minimum, banks and securities firms should be asked to disclose publicly the size and nature of their derivatives positions and trading activities, the associated average daily value-at-risk over the prior quarter and year and what assumptions underlie those calculations, and the nature of their past losses and potential future exposures.

A related issue pertains to the accuracy of the mathematical models that banks and bank regulators have been using to estimate the likelihood of the bank incurring a loss of a given magnitude, and which are increasingly being used to determine a bank’s capital needs. LTCM had such a model; it clearly failed under stress. The estimates from any such model, of course, depend crucially on its underlying assumptions. But during periods of financial stress, such as August and September 1998, price volatilities may explode, asset prices that were thought to be relatively uncorrelated may become highly correlated, and common assumptions about the liquidation periods for assets become wildly optimistic. The result is often a far greater exposure than the model had predicted—which should inject a healthy skepticism about the wisdom of relying on such models to estimate exposures and to set capital requirements.

This problem is further compounded by the copycat problem exposed by LTCM’s troubles. Goldman, Sachs & Co., Merrill Lynch, Bankers Trust and Salomon Smith Barney all reported hundreds of millions of dollars of losses in the third quarter of 1998 on “relative value trades” similar to those made by LTCM and other hedge funds. In explaining its losses, Henry M. Paulson, the co-chairman of Goldman, Sachs & Co. said (as quoted in Kahn, 1998b): “Our risk model did not take into account enough of the copycat problem. . . . Everyone has similar positions and in a liquidity crisis is forced to reduce at the same times.” The “herd behavior” by banks and securities firms in copying LTCM’s trading strategy created an unanticipated vulnerability in the banking and financial system. This possibility needs to be incorporated into the risk-management practices of banks, securities firms, and bank regulators. At minimum, the possibility of herd behavior makes the assumption of “observational independence” that commonly underlies the estimates of risk management models seem dangerously naïve.

Finally, it is important to keep in mind that no amount of disclosure or rule-changing will subject banks and securities firms to more effective market

discipline unless there are strong incentives for market participants to use this information. Short of a wholesale restructuring of the banking and regulatory system, such as adopting some form of “collateralized bank” system (Edwards, 1996), a proposal that deserves careful consideration is to require banks to maintain a certain proportion of their capital requirements in the form of uninsured, junior (or subordinated), short-maturity debt (for example, see Calomiris, 1997). Since subordinated debt holders would be exposed to significant losses in the event of a bank insolvency, they would have a strong incentive to monitor banks and to demand the information to do this effectively.

### **Hedge Fund Regulation**

It is difficult to argue convincingly for greater regulation of hedge funds based on protecting the wealthy and sophisticated investors who use them. In fact, most hedge funds did not experience the catastrophic losses that LTCM did in August 1988. The annualized 1998 return on a size- or value-weighted index of all hedge funds was slightly positive through the end of August 31, 1998. Some hedge funds even had substantial positive returns through that time. For example, on a value-weighted basis, the 75 “Global Macro” funds in the Managed Accounts Reports database had average annualized returns of more than 21 percent, and the 254 “Market Neutral” funds, which is what LTCM claims to be, had average annualized returns of about 3 percent. For all of 1998, the average U.S. hedge fund reportedly returned 11.7 percent to its investors (Oppel, 1999). Even looking just at the LTCM picture, an investor who started with LTCM in February 1994 and maintained the initial investment until mid-September 1998, just before the reorganization, but was lucky enough to have withdrawn all profits that had accrued by year-end 1997 when LTCM returned \$2.7 billion to its initial investors, would have made about 90 cents for every dollar originally invested, or about 15 percent a year (Kahn, 1998a). Of course, latecomers to LTCM in 1998 wouldn’t have fared as well!

It has been suggested that hedge funds should be forced to provide more information about their activities to investors and creditors. But hedge fund investors and creditors, with the apparent exception of banks for the reasons already discussed, already have strong incentives to obtain the information they feel is necessary to protect themselves. If they do not like the information they receive from a hedge fund, they have an obvious remedy: do not deal with that hedge fund. Competition among the more than 3000 hedge funds for investors’ dollars should assure that hedge fund managers will make optimal trade-offs between providing more information and preserving proprietary secrets.<sup>7</sup> If private markets cannot work under these conditions to bring about the optimal amount of disclosure, when can they ever work? To the extent that LTCM was an exception to this market discipline, its investors and creditors may have been blinded by LTCM’s star-studded management.

If an argument is to be made for greater regulation of hedge funds, it must be

<sup>7</sup> It should also be noted that hedge funds, like other money managers, are subject to common law fraud provisions concerning the accuracy and honesty of their disclosure documents.

made on the grounds that significant negative externalities may be associated with their activities. For example, Malaysia's Prime Minister Mahathir Mohamad (1997) charged that short-term currency speculators, and particularly large hedge funds, were the primary cause of the collapse of the Malaysian ringgit in summer 1997, resulting in the collapse of the Malaysian economy. Some prominent economists as well have spoken in favor of capital controls as a way of curbing volatile speculative capital flows, which they believe destabilized the economies of East Asian countries (Stiglitz, 1998). In the same vein it has been argued that LTCM took such large positions in some relatively illiquid securities that the mere threat of it having to unwind those positions could have caused a "freeze-up" in these and related markets, with severe repercussions for the markets and countries involved. To prevent these negative effects, it is argued that hedge funds should be limited in how much they can invest in certain areas, or in how much they can borrow, and at the very least they should have to disclose periodically their investment and derivatives positions to financial authorities.

However, the contention that speculation is destabilizing is not new, and it goes far beyond hedge funds. Neither theoretical nor empirical studies of speculation have reached a general consensus about whether speculation is likely to be destabilizing or stabilizing (for an example focused on Korea, see Choe, Kho and Stulz, 1998). With respect to hedge funds themselves, they account for only a small fraction of total international speculative capital flows, and there is no evidence that they have an effect disproportionate to their small size. (Remember from the earlier discussion that most hedge funds borrow no more than their equity, and one-third do not borrow at all.) It is difficult, of course, to examine this issue rigorously because of the lack of detailed data on hedge funds' positions, or for that matter, on the positions of all other institutional investors. But if controls or regulation of international speculative capital flows are deemed desirable, these controls should extend to all institutional money managers worldwide, and not just to U.S. hedge funds.<sup>8</sup>

## **Conclusion**

Calls for more hedge fund disclosure, or for limits on hedge fund leverage, or limits on the fees charged by hedge fund managers, all divert the public policy debate from where it should focus. To the extent that hedge fund disclosure is inadequate or hedge fund leverage is excessive or fees are inappropriate, the fault lies with those who are willing to trade with, lend to, or invest in, hedge funds. Creditors and investors who make questionable judgements about hedge funds will bear their own losses.

The public debate should instead focus on the risks of systemic financial

<sup>8</sup> Some economists have promoted the notion of a tax on speculative transactions as a way to reduce the alleged destabilizing effects of speculation; for the case in favor of such taxes, see Stiglitz (1989) and Summers and Summers (1989), for the case against, see Schwert and Seguin (1993) and Edwards (1993). In my view, it is doubtful that such controls would be effective, or, if effective, desirable.

fragility. The ways in which the plight of Long-Term Capital Management became entangled with the solvency of some large banks and securities firms is a wake-up call about problems in risk management practices and regulation that need to be addressed. The last 20 years have seen 90 banking crises throughout the world where banking system losses have equaled or exceeded those experienced by the U.S. banking system in the Great Depression. A common feature of those crises has been excessive risk-taking by banks (Calomiris, 1999). The public policy warning sent by the collapse of LTCM is clear: the risk management practices of even U.S. banks and other major financial institutions are not what they should be. Bank regulation has fallen seriously behind market developments, perhaps especially with respect to hedge funds and off-exchange derivatives markets.

■ *The author thanks his colleagues Charles Calomiris and Rick Mishkin for many helpful comments, and Linda Edwards, Alan Krueger, Brad De Long, Steve Selig and Timothy Taylor for both substantive and editorial suggestions. They should, of course, be absolved from responsibility for the opinions expressed in this paper.*

## References

- "**American Banks.**" 1998. *Economist*. October 17, p. 87.
- Barboza, David and Jeff Gerth.** 1998. "On Regulating Derivatives." *New York Times*. December 15, p. C1.
- Bernanke, Ben S.** 1983. "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression." *American Economic Review*. June, 73, pp. 393–430.
- Bernanke, Ben S. and Cara S. Lown.** 1991. "The Credit Crunch." *Brookings Papers on Economic Activity*. 2, pp. 205–48.
- Brown, Stephen J., William N. Goetzmann, and Roger G. Ibbotson.** 1997. "Offshore Hedge Funds: Survival and Performance 1989–1995." Yale University, unpublished.
- Brown, Stephen J., William N. Goetzman, and James Park.** 1997. "Conditions for Survival: Changing Risk and the Performance of Hedge Fund Managers and CTAs." Yale University, unpublished.
- Caldwell, Ted.** 1995. "Introduction: The Model of Superior Performance." in *Hedge Funds*. Lederman, Jess and Klein, eds. New York: Irwin Professional Publishing.
- Calomiris, Charles W.** 1997. *The Postmodern Bank Safety Net: Lessons from Developed and Developing Economies*. American Enterprise Institute: Washington, D.C.
- Calomiris, Charles W. and Berry Wilson.** 1998. "Bank Capital and Portfolio Management: the 1930's Scramble to Shed Risk." National Bureau of Economic Research, Working Paper no. 6649, July.
- Calomiris, Charles W.** 1999. "How to Invent a New IMF." *The International Economy*. January/February.
- Carhart, Mark M.** 1997. "On Persistence in Mutual Fund Performance." *Journal of Finance*. 52, pp. 57–82.
- Chevalier, J. and G. Ellison.** 1997. "Risk Taking by Mutual Funds as a Response to Incentives." *Journal of Political Economy*. 105, pp. 1167–1200.
- Choe, Hyuk, Bong-Chan Kho, and Rene M. Stulz.** 1998. "Do Foreign Investors Destabilize Stock Markets? The Korean Experience in 1997." National Bureau of Economic Research, Working Paper no. 6661, July.
- Das, Sanjiv Ranjan and Rangarajan K. Sundaram.** 1998. "On the Regulation of Fee Structures in Mutual Funds." National Bureau of Economic Research, Working Paper no. 6639, July.
- Edwards, Franklin R.** 1983. "The Clearing Association in Futures Markets: Guarantor and Regulator." *The Journal of Futures Markets*. 3:4, pp. 369–92.

- Edwards, Franklin R.** 1993. "Taxing Transactions in Futures Markets: Objectives and Effects." *Journal of Financial Services Research*. 7:1, pp. 75–93.
- Edwards, Franklin R.** 1996. *The New Finance: Regulation and Financial Stability*. AEI Press: Washington, D.C.
- Edwards, Franklin R.** 1995. "Off-Exchange Derivatives Markets and Financial Fragility." *Journal of Financial Services Research*. 9, pp. 259–90.
- Edwards, Franklin R. and Jimmy Liew.** 1999, forthcoming. "Hedge Funds and Managed Futures As Asset Classes." *The Journal of Derivatives*. Summer.
- Fuerbringer, Jonathan.** 1998. "Despite Fed's Rate Cuts, Dangers Remain." *New York Times*. October 18, sec. 3, p. 7.
- Fung, William and David Hsieh.** 1997. "Empirical Characteristics of Dynamic Trading Strategies: The Case of Hedge Funds." *Review of Financial Studies*. 10:2, pp. 275–302.
- Goetzman, William N., Jonathan Ingersoll Jr., and Stephen A. Ross.** "High Water Marks." Yale University, unpublished.
- Greenspan, Alan.** 1998. "Statement by Alan Greenspan, Chairman, Board of Governors of the Federal Reserve System." Committee on Banking and Financial Services. U.S. House of Representatives, October 1.
- Kahn, Joseph and Peter Truell.** 1998. "Hedge Funds Bets Are Now Estimated to Total \$1.25 Trillion." *New York Times*. September 28, p. C1.
- Kahn, Joseph.** 1998. "For Goldman, A 4<sup>th</sup> Quarter to Forget." *New York Times*. December 15, p. C1.
- Lenzner, Robert.** 1998. "Archimedes on Wall Street." *Forbes*. October 19, p. 52.
- Liang, Bing.** 1998. "On the Performance of Hedge Funds." Case Western Reserve University School of Management, Working Paper, May.
- Loomis, Carol.** 1996. "The Jones's Nobody Keeps Up With." *Fortune*. April, pp. 237–47.
- McDonough, William J.** 1998. "Statement by William J. McDonough, President, Federal Reserve Bank of New York." Committee on Banking and Financial Services. U.S. House of Representatives, October 1.
- McLean, Bethany.** 1998. "Everybody's Going Hedge Funds," *Fortune*. June 8, pp. 177–184.
- Mishkin, Frederic S.** 1990. "Asymmetric Information and Financial Crises: A Historical Perspective," in *Financial Markets and Financial Crises*. R. G. Hubbard, ed. Chicago, University of Chicago Press, pp. 69–108.
- Mishkin, Frederic S.** 1994. "Preventing Financial Crises: An International Perspective." *Manchester School Supplement*. 0025-2034, pp. 1–40.
- Mohamad, Mahathir.** 1997. "Highwaymen of the Global Economy." *The Wall Street Journal*. September 23, p. C1.
- Morgenson, Gretchen.** 1998. "Oh, Those Yawing Spreads." *New York Times*. August 25, sec. 3, p. 1.
- Oppel, Richard A.** 1999. "Not a Bad Year for Hedge Funds." *New York Times*. January 31, sec. 3, p. 9.
- Pacelle, Mitchell.** 1998a. "Bull Market Has a Bumper Crop: Hedge Funds." *Wall Street Journal*. June 5, p. C1.
- Pacelle, Mitchell.** 1998b. "Long-Term Capital Partnership May Get \$50 Million Fee Despite a Near-Collapse." *Wall Street Journal*. December 24, p. C1.
- Schwert, G. William and Paul J. Seguin.** 1993. "Securities Transactions Taxes: An Overview of Costs, Benefits and Unresolved Questions." *Financial Analysts Journal*. 49:5, pp. 27–35.
- Siconolfi, Michael, Anita Raghavan, and Mitchell Pacelle.** 1998. "How the Salesmanship and Brainpower Failed At Long-Term Capital." *Wall Street Journal*. November 16, p. 1.
- Stiglitz, Joseph E.** 1989. "Using Tax Policy to Curb Speculative Trading." *Journal of Financial Services Research*. 3, pp. 101–15.
- Stiglitz, Joseph.** 1998. "Boats, planes and capital flows." *Financial Times*. March 25.
- Summers, Larry and V. Summers.** 1989. "When Financial Markets Work Too Well: A Cautious Case for a Securities Transactions Tax." *Journal of Financial Services Research*. 3, pp. 261–286.
- "Turmoil in Financial Markets."** 1998. *Economist*. October 17, pp. 21–23.
- U.S. General Accounting Office.** 1994. "Financial Derivatives: Actions Needed to Protect the Financial System." GAO/GGD-94-133, May, p. 39.
- "Why Risk is a Four-letter Word."** 1998. *Economist*. September 26, p. 71.