HEDGE FUNDS: WHAT DO WE KNOW?

by Franklin R. Edwards and Stav Gaon, Columbia University Business School

While hedge funds have been around since at least the 1940s, it has been only in the last decade or so that they have attracted widespread attention. Investors—mainly wealthy individuals but increasingly also institutional investors—are turning to hedge funds because of the prospect of earning high returns even when returns on other asset classes like stocks and bonds are low or negative. This prospect, not surprisingly, has sparked still more interest in hedge funds in recent years, with plummeting returns on stocks around the world prompting investors to pursue alternative investment strategies that might insulate them in the future from the kind of bear market we have been experiencing.

Intrigued by claims that hedge funds provide not only significant diversification benefits but also "excess returns" (positive risk-adjusted returns), finance academics have sought to learn why hedge funds might be able to outperform other investments. The evidence on other institutional funds, such as mutual funds, suggests that most fund managers typically fail to beat even passive benchmarks like the S&P 500 index. Academics have examined the investment strategies used by hedge funds and the statistical characteristics of the returns generated by these strategies, and have tried to identify the attendant risks and determine whether hedge funds indeed earn "excess returns" when these risk factors are correctly accounted for.

Government regulators, too, have become increasingly interested in hedge funds, especially since the much-publicized collapse of Long Term Capital Management (LTCM) in August 1998. Over the course of only a few months (during the summer of 1998), LTCM managed to lose billions of dollars because of failed investment strategies that were not well understood by their own investors, much less by their bankers and derivatives counterparties. LTCM had managed to build up so much leverage both on- and off-balance sheet that when their investments soured they were unable to meet the demands of their creditors and counterparties. The result could have been a "firesale" of LTCM's positions and a systemic liquidity shortage, with sharp changes in asset prices and uncertain consequences for the stability of financial markets. But the Federal Reserve did not wait for this to happen. It arranged a bailout by LTCM's largest creditors and derivatives counterparties, preventing a "run" on the hedge fund. Over the course of the following year, a creditor committee managed LTCM's positions and effected an orderly liquidation.

This event was a catalyst to regulators throughout the world. Studies were undertaken by nearly every major central bank, regulatory agency, and international "regulatory" committee (including the Basle Committee and the International Organization of Securities Commissions) to determine if hedge funds posed a risk to the global financial system. Many of these studies concluded that there was a need for greater disclosure by hedge funds to increase transparency and enhance market discipline. In the fall of 1999, two bills were introduced before the U.S. Congress directed at increasing hedge fund disclosure—the "Hedge Fund Disclosure Act" (also called the "Baker Bill") and the "Markey/Dorgan Bill"—although neither was enacted.

Our aim in writing this article is to provide an overview of the structure and operation of the hedge fund industry, the various investment strategies pursued by hedge funds, the existing research on the returns and overall performance of hedge funds, and the key questions that remain to be answered.

HEDGE FUNDS AS LEGAL ENTITIES

There is no precise definition of the term "hedge fund," either in practice or in federal securities law. In general, hedge funds are unregulated private investment vehicles for wealthy individuals and institutional investors. In the United States, they are typically organized as limited partnerships, in which the limited partners are the investors and the general partners are the fund managers (who may also be investors in the fund).

This definition, however, does not provide any insight into how hedge funds differ from other investment vehicles such as mutual funds and pension funds. Crucial to an understanding of the distinction between hedge funds and more traditional investments is an appreciation of their legal status. Hedge funds are typically structured in a way that exempts them from most of the laws and regulations that apply to other investment vehicles. As a consequence, they can trade any type of security or financial instrument, operate in any market anywhere in the world, make unlimited use of any kind of derivatives instrument, engage in unrestricted short-selling, employ unlimited amounts of leverage, hold concentrated positions in any security without restriction, restrict the redemption of assets, charge their investors whatever fees they want to, and compensate their managers in any way that seems productive to the fund and its investors. In addition, they have only limited disclosure and reporting obligations to regulators, the public, or their own investors. In a sense, then, hedge funds exist as distinct investment vehicles because they are exempt from the many laws and regulations that restrict the activities of other investment institutions.[1] Any limits on their investment activities derive largely from their contractual relationships with their investors and from the market discipline exerted by creditors, counterparties, and potential investors, rather than from legal or regulatory constraints.

To be exempt from regulation by the Securities and Exchange Committee, hedge funds must be specifically exempt from not only the 1933 Securities Act's registration requirements, but also the Investment Company Act of 1940 and the Investment Advisors Act of 1940. Almost all hedge funds structure their operations to meet the qualifications for exemption from these statutes. In particular, most take advantage of the "private offering" (or "private placement") exception under Section 4(2) or the related "safe harbor" section under Regulation D of the Securities Act of 1933. This requires that hedge funds sell securities only to "accredited investors" (thereby reducing the pool of potential limited partners) to avoid the regulatory requirements that accompany sales to "non-accredited investors."[2]

Accredited investors are individuals and institutions that meet certain net worth or income requirements. In particular, qualified individuals must have income in excess of $200,000 in each of the two most recent years, or joint income with a spouse in excess of $300,000 in each of those years, and a reasonable expectation of reaching the same income level in the current year; or they must have a net worth, or joint net worth with a spouse, that exceeds $1 million at the time of purchase. An institutional investor must generally have assets in excess of $5 million or must be a bank, savings and loan association, broker/dealer, insurance company, investment company, or small business investment company licensed by the U.S. Small Business Administration. The purpose of these restrictions, obviously, is to limit hedge fund investors to wealthy and sophisticated investors who do not need the protections afforded by the federal securities laws.

To be exempt from the Investment Company Act (which regulates mutual funds), most hedge funds rely on the exceptions in either Section 3(c)(1) or 3(c)(7) of the Act. Under Section 3(c)(1), the Act does not apply if a hedge fund does not publicly offer to sell an interest in the fund and has fewer than 100 investors. Section 3(c)(7) exempts a hedge fund with more than 100 investors if its investors are "qualified purchasers."[3] Qualified purchasers are individuals or companies who own at least $5 million in investments.[4]

Hedge fund managers (the general partners) also typically qualify for the "private manager"

1. They are, of course, still subject to statutory and common law partnership principles and remedies that protect the interests of the limited partners. The Restatement (Second) of Trusts, Section 2(b), states that "[e]ach member of a partnership is in a fiduciary relationship to the other partners." See also Meinhard v. Salmon, 249 N.Y. 458 (N.Y. 1928).

2. While Rule 506 allows them to have as many as 35 "non-accredited" investors, most hedge funds prefer not to involve themselves with such investors.

3. While there is not a numeric limitation on the number of investors in a Section 3(c)(7) fund, federal securities laws generally require any issuer with 500 or more investors and $10 million of assets to register its securities and to file public reports with the SEC, which most hedge funds do not want to do. In practice, therefore, most hedge funds stay below the 500 investor level.

4. Investment Company Act of 1940, Sec. 2(a)(51), and SEC Rule 2a 51-1.

exemption from federal registration as an investment adviser, which requires that they have had fewer than 15 "clients" in the past 12 months, do not hold themselves out to the public as an investment adviser, and do not act as an investment adviser to a registered investment company or business development company.[5]

Many hedge funds are regulated by the Commodity Futures Trading Commission. They must register with the CFTC as a "commodity pool operator" (CPO) if they intend to invest in or trade one or more futures or options contracts on a regulated commodity exchange. The Commodity Exchange Act regulates CPOs and their advisers, but not the commodity pools themselves. Once registered, CPOs and their advisers must comply with the rules of the National Futures Association (NFA), avoid conflicts of interest and protect customer funds, provide written disclosure to prospective investors of the risks inherent in investing in commodity interests, adhere to restrictions on advertising, satisfy recordkeeping and reporting requirements, and subject themselves to periodic inspections by the NFA.

Hedge fund managers are subject to common legal remedies for fraud, as well as claims for fraudulent manipulation under Section 10(b) and Rule 10b-5 of the Securities Act of 1934. Typically, investors are given an offering memorandum and a partnership agreement to review and approve prior to investing in a hedge fund. These documents provide information on the potential risks associated with the fund and serve as a notice of *caveat emptor*. They also form the basis for possible contractual legal remedies at a future date.

In addition, hedge funds, like other investment funds, are subject to various regulatory reporting requirements. The SEC requires the reporting of all stock positions that exceed 5% of any class of securities issued by a publicly traded company. The U.S. Treasury requires all traders to report large positions in certain foreign currencies and in Treasury securities; and if hedge funds hold positions in exchange-traded derivatives, they are subject to "large trader" reporting requirements.

Finally, probably half of the hedge funds in the world are "offshore funds," or unregistered funds organized outside of the United States—generally in favorable tax jurisdictions like the Cayman Islands. U.S. tax-exempt investors, such as pension funds and endowment funds, will normally invest only in offshore funds that are structured as corporate entities and hence are not "tax transparent," so that unrelated business taxable income is not treated as accruing directly to the fund investors. Another reason for operating offshore is to insulate shareholders who are neither U.S. citizens nor residents from U.S. taxation.

Thus, while most hedge funds are subject to considerably less regulation than other investment institutions, they must confine their client base to relatively wealthy individuals and institutions that the law views as not in need of government protection. As hedge funds have grown, there has been increased controversy over just where the line should be drawn between "qualified" and "unqualified" investors. At present, however, only a small subset of the U.S. individual investor population is qualified to invest in hedge funds.

HEDGE FUNDS AS INVESTMENT VEHICLES

Without uniform and comprehensive reporting requirements, it is difficult to know with precision either the size of the hedge fund industry or the scope of hedge fund activities. Hedge Fund Research Inc. estimates that in 2001 there were about 7,000 hedge funds, with investor capital of about $600 billion. Of course, the amount of funds actually managed by hedge funds—in effect, their market presence—may be much greater than $600 billion because many hedge funds use substantial amounts of both on- and off-balance sheet leverage (via derivatives) to enhance their returns. Still, hedge funds are small compared to mainstream investment vehicles like stock and bond mutual funds, which manage more than $9 trillion in assets.

Hedge funds employ a wide variety of investment strategies, which makes it difficult to describe or categorize them neatly. Further, they may change strategies depending on market conditions, so that today's characterization may not describe what a hedge fund will do tomorrow. In the universe of asset management institutions, hedge funds are commonly viewed as "alternative" or nontraditional

5. Each separate company (or hedge fund, investment partnership, managed account, etc.) that the general partner manages is considered to be a single client if the fund manager bases its investment advice to the company on the company's investment objectives as opposed to the investment objectives of the individual company owners.

TABLE 1 ■ HEDGE FUND STRATEGIES: BY TRADING POSITION AND SECURITY*

	Type of Security			
Trading Position	**Predominantly Equity**	**Predominantly Fixed Income**	**Hybrid (Equity/ Fixed Income)**	**Commodity Futures**
Predominantly Long	Equity Non-Hedge (11%)		Distressed Securities Emerging Markets (6%)	
Long and Short	Equity Hedge Equity Market Neutral Risk (Merger) Arbitrage Statistical Arbitrage (39%)	Fixed Income (8%)	Convertible Arbitrage Relative Value Arbitrage Regulation D (7%)	
Long or Short			Macro Market Timing Sector (20%)	Managed Futures (3%)
Predominantly Short	Short Selling (0.3%)			

*Sources for percentages in parentheses: BarraRogers Casey, *An Introduction to Hedge Funds* (2000) and UBS Warburg, *Lemmings and Pioneers* (2002).

investment assets, with "traditional" assets (or strategies) typically considered to be long positions in stocks and bonds. While there is no universally accepted definition of an "alternative" asset, the term is generally used to describe an asset capable of generating returns that are relatively uncorrelated with returns on long positions in either stocks or bonds. Other assets commonly viewed as "alternative" investments are managed futures funds (or commodity funds),[6] private equity, securitized assets (such as collateralized mortgage obligations), and investments in physical assets such as real estate, commodities, and art. Thus, investors typically expect hedge funds, like all alternative assets, to provide them with diversification benefits by generating returns uncorrelated with returns on traditional stock and bond investments.

In our discussion of hedge fund strategies, we will employ the classifications used by Hedge Fund Research Inc. for most strategies and by The Barclay's Group for managed futures; these classifications are detailed enough to provide the reader with a reasonably comprehensive view of what hedge funds do. (See the Appendix for a description of the various strategies.) Table 1 organizes the strategies according to two criteria: the type of security (equities or fixed-income) typically held, and the type of portfolio position (long or short).[7] For example, the "equity non-hedge" strategy predominantly involves long positions in equities, very much as an equity mutual fund would, although the strategy may involve more leverage than in a mutual fund. Thus, managers of equity non-hedge funds specialize in "stock selection," or in finding undervalued stocks, and may hold portfolios of stocks that are exposed to both idiosyncratic (company) risk and systematic (market) risk. In contrast, the "equity market neutral" strategy holds *both* long and short positions in equities simultaneously, and typically seeks to hedge or neutralize market risk in order to concentrate on capturing pricing inefficiencies in equity markets. The primary exposure therefore is to idiosyncratic risk. This strategy makes extensive use of short-selling, and often employs equity derivatives either as part of the hedge or to enhance returns through additional leverage. Significant amounts of balance sheet leverage may also be used. Finally, a "macro" strategy holds *either* long or short positions in order

6. We view managed futures funds as a type of hedge fund, since their organizational structure and investment objectives are similar to those of hedge funds.

7. Derivatives on equity or fixed-income assets are included in the equity and fixed-income categories.

TABLE 2
HEDGE FUND STRATEGIES AND MANAGER SKILL

Identify Asset Mispricing	Predict Market Direction	Both
Convertible Arbitrage	Macro	Emerging Markets
Distressed Securities	Managed Futures	Equity Hedge
Equity Market Neutral	Market Timing (Trend Following)	Equity Non-Hedge
Fixed Income		Sector
Regulation D		Short Selling
Relative Value Arbitrage		
Risk (Merger) Arbitrage		
Statistical Arbitrage		

to bet on the future direction of equity, fixed-income, or currency markets, either in the United States or in foreign markets. As such, this strategy is exposed primarily to systematic risk.

Table 1 also shows (in parentheses) the estimated percentages of investor funds committed to the different investment strategies. More than half of all investor funds are in "long and short" strategies. These strategies, whether in equity or fixed-income markets, predominantly seek to profit from market inefficiencies in the pricing of assets, while either eliminating or significantly limiting exposure to market (or systematic) risk. Only 17% of investor funds (or about one in six) are committed to long-only strategies that seek to exploit undervalued securities. Most of the remainder of investor funds are invested through "long or short" strategies that attempt to time the market based on fund managers' forecasts of future price trends. Investors in these strategies are primarily exposed to systematic risk (or sector risk).

Table 2 provides an alternative classification based on the managerial skill required to successfully implement a strategy. All strategies seek to exploit some type of market inefficiency or asset mispricing. For example, successful managers employing an "equity market neutral" strategy must be able to identify stock mispricings and then figure out a low-cost way to eliminate risk exposures that are extraneous to exploiting those pricing inefficiencies, such as by hedging out market risk. In contrast, the primary skill required of fund managers employing market-timing strategies, including those used by "macro" funds and "managed futures," is to predict the future direction of the market. A major risk associated with these strategies comes from unexpected economic news about macro factors that affect both the entire economy and the overall market (that is, systematic risk).

Besides pursuing different investment strategies, hedge fund managers are also compensated differently than more conventional money managers. Whereas almost all mutual funds and hedge funds charge a fixed percentage of assets under management (usually 1-2%), hedge fund managers typically receive in addition an incentive fee of 10-20% of the absolute return (above some benchmark return like the Treasury bill rate) achieved by a fund during a stated time period, typically a year. Hedge funds also may require that their fund managers have a personal investment in the fund to ensure a better alignment of managerial and investor interests, and may employ "high-water marks" that require managers to exceed previous profit levels before receiving additional incentive compensation.

A review of the strategies described in the Appendix and in Tables 1 and 2, together with our discussion of the legal status of hedge funds, suggests several defining characteristics of hedge funds:

1. As largely unregulated institutions, they are free to pursue any investment strategy;
2. They typically invest in equities and fixed-income assets (and associated derivatives);
3. They commonly hold long and short positions simultaneously in order to profit from asset mispricings;
4. They make extensive use of short-selling in order to profit from declining asset prices or from falling markets;
5. They make use of both on- and off-balance sheet leverage to enhance returns;
6. They may concentrate their portfolio holdings in a limited number of securities;
7. They often make extensive use of derivatives in order to hedge or eliminate risks that are extraneous to the investment strategies they are pursuing;
8. They typically restrict the redemption of investor funds;

TABLE 3 ■ HEDGE FUND PERFORMANCE: 01/90-11/02*

		01/90-11/02			01/90-02/00			03/00-11/02			Test Statistics	
Hedge Fund Style	**Skill**	**AV%**	**AR%**	**Sharpe**	**AV%**	**AR%**	**Sharpe**	**AV%**	**AR%**	**Sharpe**	**F-stat**	**Abs. t-stat**
HFR Equity Market Neutral	M	3.28	10.41	1.77	3.19	11.20	2.01	3.55	7.51	1.19	0.81	1.53
HFR Convertible Arbitrage	M	3.40	11.73	2.10	3.53	11.78	1.97	2.88	11.58	2.87	1.50	0.08
HFR FI (Total)	M	3.66	10.98	1.74	3.67	12.24	2.03	3.40	6.41	0.91	1.17	2.19*
HFR Relative Value Arbitrage	M	3.82	13.12	2.23	4.09	14.43	2.35	2.17	8.41	2.35	3.55*	2.13*
HFR FI: Diversified	M	3.84	8.31	0.97	3.12	7.59	0.90	4.95	9.68	1.29	0.40*	0.67
HFR Statistical Arbitrage	M	4.10	9.61	1.22	3.75	11.64	1.82	4.72	2.38	–0.19	0.63	3.22*
HFR Merger Arbitrage	M	4.50	11.29	1.49	4.61	12.90	1.76	3.72	5.52	0.60	1.53	2.26*
HFR FI: Arbitrage	M	4.62	8.71	0.89	4.92	9.42	0.94	3.26	6.13	0.87	2.27*	0.98
HFR FI: Mortgage-Backed	M	4.98	10.55	1.20	4.70	10.61	1.24	5.72	10.42	1.24	0.67	0.05
HFR Distressed Securities	M	6.36	14.38	1.54	6.58	17.10	1.87	4.77	4.84	0.32	1.90*	2.63*
HFR FI: High Yield	M	6.78	9.34	0.70	7.23	11.09	0.87	4.51	3.09	–0.05	2.57*	1.64
HFR Event-Driven	M	6.80	14.56	1.46	6.70	17.76	1.93	6.88	3.39	0.01	0.95	2.87*
HFR Market Timing	D	6.89	13.66	1.31	6.77	16.84	1.78	6.63	2.57	–0.11	1.04	2.87*
HFR Regulation D	M	7.43	16.88	1.65	6.55	31.38	4.06	5.42	–2.31	–1.03	1.46	6.29*
HFR Macro	D	8.80	16.87	1.39	9.20	21.19	1.78	5.72	2.07	–0.21	2.59*	2.97*
HFR Equity Hedge	B	9.36	18.88	1.52	9.00	24.98	2.24	8.80	–1.37	–0.53	1.04	3.92*
HFR FI: Convertible Bonds	M	13.48	10.37	0.43	9.93	18.38	1.37	19.12	–8.02	–0.59	0.27*	2.71*
HFR Sector (Total)	B	14.42	20.69	1.12	12.73	31.04	2.06	16.84	–11.39	–0.87	0.57*	4.23*
HFR Equity Non-Hedge	B	14.92	16.79	0.82	13.68	23.81	1.39	17.64	–6.13	–0.53	0.60	2.81*
HFR Emerging Markets: Global	B	15.77	15.54	0.69	16.92	21.82	1.01	10.63	–1.42	–0.44	2.54*	1.96
HFR Emerging Markets (Total)	B	15.78	14.90	0.65	16.34	19.40	0.89	12.88	–0.41	–0.29	1.61	1.71
HFR Short Selling	B	22.76	6.11	0.07	20.81	–1.32	–0.29	27.87	38.24	1.25	0.56*	2.24*
BARCLAY CTA	D	9.25	7.17	0.28	9.40	7.53	0.29	8.79	5.86	0.29	1.14	0.25
BARCLAY BTOP 50	D	10.52	9.73	0.49	9.90	9.67	0.49	12.71	9.94	0.52	0.61*	0.03
HFR Fund of Funds	-	5.95	10.56	1.00	6.12	13.46	1.41	4.28	0.40	-0.68	2.05*	3.13*
HFR Fund Weighted Composite	-	7.29	14.85	1.41	7.05	18.99	2.01	7.00	0.68	-0.37	1.01	3.52*
S&P 500	-	15.16	9.08	0.30	13.49	15.26	0.78	19.26	–11.23	–0.75	0.49*	2.58*
Russell 2000	-	19.26	9.07	0.23	17.81	14.69	0.56	23.38	–9.58	–0.55	0.58*	1.83
JPM US Gov. Bond	-	4.27	8.08	0.81	4.03	7.51	0.67	5.12	10.23	1.35	0.61*	0.86

*In "Hedge Fund Style" column, all are indices. HFR is Hedge Fund Research Inc. FI is Fixed Income. See the Appendix for a description of the various hedge fund styles. Skill identifies the classification in Table 2, where M: Mispricing, D: Directional and B: Both. "AV%" is Annual Volatiliy, which is the annualized standard deviation of monthly returns during the period. "AR%" is Annual Return, which is the annualized mean of the monthly returns during the period. "Sharpe" is the Sharpe Ratio, which is: (Annual Return minus the average annual 3-month T-bill rate)/Annual Volatility. The Abs t-stat(istic) tests whether there is a significant difference between the two subperiod mean returns, where * signifies significance at the 5% level. The F-stat(istic) tests whether there is a significant difference between the two subperiod return variances, where * signifies significance at the 5% level. We thank Hedge Fund Research Inc. (HFR) and The Barclay Group for providing these data.

9. They make extensive use of incentive payments to compensate fund managers in an effort to align investor and manager interests; and

10. The investment objective of hedge funds is to provide an "absolute" return (a specified positive return) at all times, regardless of whether the stock market is rising or falling.

HEDGE FUND PERFORMANCE

Table 3 provides simple performance statistics for the various investment strategies for the period January 1990 through November 2002 and for two subperiods, January 1990 through February 2000 and March 2000 through November 2002. These

TABLE 4 ■ HEDGE FUND CORRELATION COEFFICIENTS: 01/90-11/02*

	01/90-11/02 Correlation with			01/90-02/00 Correlation with			03/00-11/02 Correlation with		
Hedge Fund Style	**S&P 500**	**Russell 2000**	**JPM US Gov Bond**	**S&P 500**	**Russell 2000**	**JPM US Gov Bond**	**S&P 500**	**Russell 2000**	**JPM US Gov Bond**
HFR Equity Market Neutral	0.13	0.22*	0.21*	0.24*	0.31*	0.23*	–0.21	–0.05	0.20
HFR Convertible Arbitrage	0.34*	0.43*	0.08	0.37*	0.48*	0.15	0.29	0.29	–0.19
HFR FI (Total)	0.42*	0.60*	0.00	0.41*	0.57*	0.06	0.39**	0.67*	–0.15
HFR Relative Value Arbitrage	0.34*	0.49*	-0.04	0.33*	0.53*	–0.04	0.41**	0.36**	0.03
HFR FI: Diversified	0.02	0.18	0.44*	0.40*	0.34*	0.44*	–0.28	0.05	0.44*
HFR Statistical Arbitrage	0.59*	0.42*	0.17**	0.50*	0.36*	0.40*	0.73*	0.49*	–0.29
HFR Merger Arbitrage	0.46*	0.54*	0.03	0.48*	0.57*	0.10	0.38**	0.41**	–0.15
HFR FI: Arbitrage	–0.06	0.07	–0.23*	–0.09	0.04	–0.30*	–0.06	0.13	0.05
HFR FI: Mortgage-Backed	0.03	0.13	–0.07	–0.01	0.05	0.07	0.08	0.25	–0.29
HFR Distressed Securities	0.39*	0.59*	–0.07	0.36*	0.60*	–0.04	0.41**	0.59*	–0.13
HFR FI: High Yield	0.42*	0.55*	0.03	0.45*	0.56*	0.11	0.33	0.60*	–0.32
HFR Event-Driven	0.63*	0.80*	0.03	0.61*	0.78*	0.08	0.62*	0.86*	–0.15
HFR Market Timing	0.66*	0.67*	0.07	0.61*	0.64*	0.21**	0.76*	0.72*	–0.26
HFR Regulation D	0.17	0.25**	–0.33*	0.12	0.12	–0.27	–0.12	0.29	–0.35
HFR Macro	0.39*	0.48*	0.29*	0.46*	0.49*	0.35*	0.04	0.42**	0.19
HFR Equity Hedge	0.65*	0.83*	0.00	0.60*	0.83*	0.11	0.77*	0.89*	–0.22
HFR FI: Convertible Bonds	0.70*	0.77*	–0.21**	0.64*	0.82*	–0.01	0.72*	0.73*	–0.39
HFR Sector (Total)	0.57*	0.79*	–0.08	0.48*	0.76*	0.04	0.69*	0.87*	–0.28
HFR Equity Non-Hedge	0.78*	0.93*	–0.04	0.75*	0.95*	0.10	0.83*	0.90*	–0.34
HFR Emerging Markets: Global	0.48*	0.59*	–0.17	0.46*	0.58*	–0.16	0.59*	0.72*	–0.19
HFR Emerging Markets (Total)	0.57*	0.62*	–0.09	0.53*	0.59*	–0.03	0.71*	0.79*	–0.27
HFR Short Selling	–0.69*	–0.85*	0.06	–0.66*	–0.87*	–0.05	–0.73*	–0.79*	0.28
BARCLAY CTA	–0.18**	–0.24*	0.24*	–0.10	–0.25*	0.17	–0.46*	–0.27	0.50*
BARCLAY BTOP 50	–0.17**	–0.24*	0.34*	–0.03	–0.23*	0.27*	–0.48*	–0.26	0.50*
HFR Fund of Funds	0.43*	0.55*	0.02	0.39*	0.49*	0.05	0.55*	0.78*	–0.04
HFR Fund Weighted Composite	0.70*	0.87*	–0.02	0.66*	0.87*	0.08	0.77*	0.90*	–0.25

*In "Hedge Fund Style" column, all are indices. HFR is Hedge Fund Research Inc. FI is Fixed Income. See the Appendix for a description of the various hedge fund styles. In the column headings, S&P 500, Russell 2000, and JPM US Gov. Bond are all indices. ** and * signify significance at the 5% and 1% level, respectively.

subperiods approximately represent bull and bear stock markets, respectively. The statistics are based on average monthly returns net of fees for all hedge funds using a particular investment style as reported to Hedge Fund Research Inc.[8] Defunct funds are included when computing historical returns, so that index returns should be largely free of survivorship bias (described in more detail later). Table 4 provides statistics on the correlations between the returns on the different hedge fund strategies and the returns on three (passive long-only) stock and bond portfolios: the S&P 500 Index, the Russell 2000 Index, and the JP Morgan U.S. Government Bond Index.

The performance statistics in Table 3 and Table 4 suggest the following conclusions:

1. During the entire January 1990–November 2002 period, most hedge fund strategies had higher

8. The Hedge Fund Research (HFR) indexes are equally weighted indexes of returns and are re-weighted monthly. The data consist of more than 1,500 hedge funds managing more than $260 billion of assets. Hedge funds voluntarily report their performance to a small number of data vendors and fund advisors, which then publish indexes of hedge fund returns for the various investment strategies. However, some hedge funds may choose not to report their performance to any data vendor. The major hedge fund databases are HFR, Zurich, Hennesse, Tuna, and Altvest. These databases may differ from one another because they may not contain the same samples of hedge funds.

average returns and higher Sharpe ratios (or risk-adjusted returns)[9] than did the traditional benchmarks; "long and short" hedge fund strategies (as identified in Table 1) generally had lower return volatilites, which is the reason they had the highest Sharpe ratios.

2. During the March 2000–November 2002 subperiod, most hedge fund strategies performed better than equities (based on Sharpe ratios), but only two strategies outperformed the JP Morgan U.S. Government Bond Index; and the average return on most strategies declined markedly from the early years while the volatility of returns was more stable.

3. With the exception of short-selling, the best-performing hedge fund strategies during the three-year period of declining equity values were those using both long and short positions to achieve a market-neutral strategy.

4. Finally, several hedge fund strategies performed well (or had positive Sharpe ratios) during the three-year bear stock market, including short-selling, convertible arbitrage, relative value, fixed income (especially mortgage-backed securities), and managed futures.

In summary, simple (single-factor) performance statistics suggest that hedge funds have generally been able to outperform traditional investment strategies by a wide margin, even though the performance of some strategies during the last few years of bear stock markets may not have lived up to the expectations of some investors. This conclusion raises two obvious questions: Is hedge fund performance being measured correctly on a risk-adjusted basis? And, if so, how can the persistence of high hedge fund returns be reconciled with the widely accepted view that financial markets are efficient?

Data on Hedge Fund Returns

Evaluating hedge funds performance is complicated by the lack of good data on hedge fund returns. Two important data biases have been identified in the literature on hedge funds: survivorship bias and selection bias.[10] Survivorship bias may inflate historical returns if reported index (or average) returns for hedge funds do not include the returns of funds that have not survived.[11] The failure rate is high in the hedge fund industry: about 30% of new funds do not last more than three years. Estimates of the effect of survivorship bias on hedge fund returns range from about 1.5% to 3.0% per annum.[12] The extent of this bias also can be different for different investment styles (and for different databases for the same investment style).[13]

Selection bias can arise from the voluntary nature of hedge fund reporting. If only hedge funds with good performance choose to report to data vendors, this will result in an upward bias in reported average returns. On the other hand, there is anecdotal evidence that highly successful hedge funds may choose *not* to disclose their performance because they have no interest in attracting additional clients (or they are "closed"). If the latter effect is dominant, reported hedge fund returns may *understate* hedge fund performance. Thus, there is no way to estimate either the direction or the magnitude of any selection bias, although it is probably small if it exists at all.[14]

---

9. 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 return over and above the return 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.

10. See, for example, William Fung and David A Hsieh, "Performance Characteristics of Hedge Funds and Commodity Funds: Natural vs. Spurious Biases," *Journal of Financial and Quantitative Analysis*, Vol. 35, No. 3 (2000); and Franklin R. Edwards and Mustafa O. Caglayan, "Hedge Fund Performance and Manager Skill," *Journal of Futures Markets*, Vol. 21, No. 11 (2001).

11. See Chris Brooks and Harry M. Kat, "The Statistical Properties of Hedge Fund Index Returns and their Implications for Investors," *Journal of Alternative Investments*, Fall 2002.

12. Bing Liang reports an annual survivorship bias of 2.24% in "Hedge Funds: The Living and the Dead," *Journal of Financial and Quantitative Analysis*, Vol. 35, No. 3 (2000). Fung and Hsieh (2000), cited earlier, report a 3.0% annual bias, and Edwards and Caglayan (2001), cited earlier, report a 1.85% bias.

13. For example, Edwards and Caglayan (2001), cited earlier, estimate that the annual survivorship bias ranges from a low of 0.36% for market-neutral equity funds to a high of 3.06% for long-only equity funds. Excluding nonsurvivors may result in other survivorship biases as well. Gaurav Amin and Harry Kat report a significant downward bias in estimates of the standard deviation of individual hedge fund returns, and an upward bias in the skewness and a downward bias in the kurtosis estimates of individual hedge fund returns; see their paper entitled "Welcome to the Dark Side: Hedge Fund Attrition and Survivorship Bias 1994-2001," Working Paper (2002), ISMA Centre, University of Reading. For the effect of different databases see Brooks and Kat (2002), cited earlier.

14. See Fung and Hsieh (2000), cited earlier. Another possible type of selection bias might be labeled "instant history" bias, which may arise from data vendors' practice of "back-filling" the returns of funds added to their databases. Since only hedge funds with recent track records of good performance are likely to want to report their performance to data vendors, back-filling their returns will result in an upward bias in reported average returns. Evidence of an "instant history" bias has been found by a number of researchers (and to avoid or mitigate this bias, researchers commonly exclude the first 12 or 24 months of returns for all hedge funds in their samples). Edwards and Caglayan (2001), cited earlier, find that the average annual return of hedge funds during the first year of their *reported* performance is about 1.17 percentage points higher than their average annual returns in subsequent years, independent of when they began reporting their performance. Fung and Hsieh (2000), cited earlier, also estimate an "instant history" bias of as much as 1.4% for reported average annual hedge fund returns.

Another possible bias is the "stale price" bias, which may arise if hedge funds that hold assets traded in illiquid markets do not mark their assets to market in a timely fashion. If this occurs, estimated standard deviations of returns and correlation coefficients may be biased downward.[15]

Multifactor Models of Hedge Fund Performance

A more serious criticism of the simple performance measures in Table 3 is that they may not accurately reflect the risk exposures associated with hedge fund strategies. In particular, although commonly used linear multifactor risk models typically reveal significant positive excess returns, they are seldom able to explain more than 10% of the variation in individual hedge fund returns.[16] In contrast, these same models are able to explain almost *all* of the variation in mutual fund returns.[17] Consequently, unidentified risk factors may be responsible for the excess returns that we observe hedge funds earning. Further, many hedge fund strategies have option-like payoffs that result in nonlinear risk exposures relative to standard asset classes, which would make the use of linear factor models inappropriate.[18] As a consequence, recent research has used nonlinear models in order to replicate the nonlinear return characteristics of hedge fund strategies. For example, factors that reflect the returns on passive option-based strategies explain a much larger proportion of the variance of hedge fund returns than do linear multifactor models.[19] Alternatively, replicating a "trend following" strategy with portfolios of "lookback" option straddles explains nearly 48% of the variation of returns on this strategy, whereas even an eight-factor linear model is able to explain only about 1% of the return variation.[20]

Table 5 provides a summary of some of the leading studies of hedge fund performance and their approaches to measuring and explaining hedge fund returns. While in recent years we have learned more about the characteristics of hedge fund strategies and as a result have obtained better estimates of hedge fund performance, it is clear that there is more to be done before we can be reasonably certain that hedge funds reliably outperform traditional investments. Current research, however, suggests that many hedge funds do in fact earn excess returns (unlike mutual funds), which raises the question of how this finding can be reconciled with the widely accepted paradigm of market efficiency. We address this question in the next, and final, section.

WHY SHOULD HEDGE FUNDS BE ABLE TO EARN EXCESS RETURNS?

There is a substantial body of empirical evidence supporting the view that financial markets are efficient.[21] In an efficient market, asset mispricing should be quickly eliminated by the rapid inflow of new capital, so that fund managers cannot consistently earn excess returns by exploiting such inefficiencies. In fact, almost all studies of mutual funds find that, after fees are accounted for, mutual funds underperform the market.[22] Why, then, should hedge fund managers be able to earn excess returns when most other fund managers cannot?

One possible explanation is that there are significant information costs in investing, so that better-informed (or more highly skilled) managers

15. See Clifford Asness, Robert Krail, and John Liew, "Do Hedge Funds Hedge?," *Journal of Portfolio Management*, Vol. 28, No. 1 (2001).

16. This is what Edwards and Caglayan (2001), cited earlier, find using a standard static linear six-factor model, consisting of the four Fama-French risk factors and two bond return factors, to explain hedge fund returns. Multifactor models are also unable to capture the complex and dynamic nature of many hedge fund strategies even when estimated in a time-dependent framework to permit time-varying expected returns; see also Bing Liang, "On the Performance of Hedge Funds," *Financial Analysts Journal*, Vol. 55, No. 4 (1999); and Vikas Agarwal and Narayan Y. Naik, "On Taking the 'Alternative' Route: Risks, Rewards, Style and Performance Persistence of Hedge Funds," *Journal of Alternative Investments*, Vol. 2, No. 4 (2000). See also Harry M. Kat and Joelle Miffre, "Performance Evaluation and Conditioning Information: The Case of Hedge Funds," ISMA Discussion Papers in Finance, 2002-10.

17. See, for example, Mark M. Carhart, "On Persistence in Mutual Fund Performance," *Journal of Finance*, Vol. 52, No. 1 (1997).

18. Evidence of this nonlinearity can be found in the characteristics of hedge funds' returns. For example, Brooks and Kat (2002), cited earlier, find that the net-of-fees monthly returns of the average individual hedge fund exhibit significant degrees of negative skewness, excess kurtosis, and positive first-order serial correlation. Another potential problem is that traditional performance measures may be susceptible to manipulation by fund managers. See, for example, William N. Goetzmann, Jonathan Ingersoll, Matthew Spiegel, and Ivo Welch, "Sharpening Sharpe Ratios," Yale ICF Working Paper No. 02-08 (2002).

19. See Vikas Agarwal and Narayan Y. Naik, "Characterizing Hedge Funds Risks with Buy-and-Hold and Option-Based Strategies," Working Paper (2001), Georgia State University, who construct these risk factors by calculating returns on portfolios that dynamically trade at-the-money and out-of-the-money put and call options on the S&P 500 composite index; they find that 35% of hedge funds have significant excess returns.

20. William Fung and David A. Hsieh, "The Risk in Hedge Funds Strategies: Theory and Evidence from Trend Followers," *Review of Financial Studies*, Vol. 14, No. 2 (2001). See also Mark Mitchell and Todd Pulvino, "Characteristics of Risk and Return in Risk Arbitrage," *Journal of Finance*, Vol. 56, No. 6 (2001).

21. But see Andrei Shleifer, *Inefficient Markets—An Introduction to Behavioral Finance* (Oxford and New York: Oxford University Press, 2000), which provides an overview of the evidence against the efficient markets hypothesis.

22. See, for example, Martin Gruber, "Another Puzzle: The Growth in Actively Managed Mutual Funds," *Journal of Finance*, Vol. 51, No. 3 (1996).

TABLE 5 ■ STUDIES OF HEDGE FUND PERFORMANCE*

■ Paper: Ackermann, McEnally, and Ravenscraft (1999) Data: HFR + MAR (IF) Period: 01/88-12/95 Model: CAPM (S&P 500 and other major indices) Adjusted R^2: Not reported. Excess Returns/Alphas: 6-8% per year for different time periods.
■ Paper: Edwards and Caglayan (2001) Data: MAR (ZCM as of March 2001) (IF) Period: 01/90-08/98 Model: Multifactor (6 factors) Adjusted R^2: 0.05 to 0.20 for individual funds (provided by authors). Excess Returns/Alphas: 5-15% per year, depending on style.
■ Paper: Liang (1999) Data: HFR (IF) Period: 01/94-12/96 Model: Multifactor (8 factors) Adjusted R^2: 0.20 for Foreign Exchange to 0.77 for Emerging Markets. Excess Returns/Alphas: 7 of 16 styles have alphas from 7-16% per year.
■ Paper: Agarwal and Naik (2000) Data: HFR (I) Period: 01/94-09/98 Model: Multifactor (8 factors) Adjusted R^2: 0.38 for Fixed Income Arb. to 0.83 for Long Equity. Excess Returns/Alphas: 1-10% per year, depending on style.
■ Paper: Kat and Miffre (2002) Data: ZCM (IF) Period: 05/90-04/00 Model: Static and conditional single and multifactor (1, 3, and 6 factors). Adjusted R^2: Static: 0.13 (single factor) to 0.20 (3-factor model); Conditional: 0.23 (single factor model) to 0.34 (3-factor model). Excess Returns/Alphas: 7-9% per year, depending on style.
■ Paper: Fung and Hsieh (1997) Data: TASS + Paradigm LDC (IF) Period: 01/91-12/95 Model: Multifactor (12 factors), includes dynamic trading strategy factors. Adjusted R^2: Predicted to be reasonably high for about 40% of hedge funds. Excess Returns/Alphas: Alphas not reported.
■ Paper: Agarwal and Naik (2001) Data: HFR + CSFB/Tremont (I + IF) Period: 01/90-06/00 Model: Multifactor (15 factors), includes dynamic trading strategy factors. Adjusted R^2: From 0.30 for Relative Value Arbitrage (94-95) to 0.94 for Equity Non-Hedge (98-99). Excess Returns/Alphas: Positive alphas for most styles and sub-periods.
■ Paper: Fung and Hsieh (2001) Data: TASS (IF) Period: 1989-1997 Model: Multifactor and replication for Trend Following strategy. Adjusted R^2: Replication methodology obtains adjusted R^2 of 0.48. Excess Returns/Alphas: Alphas not reported.
■ Paper: Mitchell and Pulvino (2001) Data: 4750 merger/acquisition events Period: 1963-1987 Model: Multifactor and replication for Risk Arbitrage strategy Adjusted R^2: From 0.06 to 0.07 for multifactor model. Excess Returns/Alphas: Excess returns approximately 4% annually.

*__Key for Data field:__ HFR: Hedge Fund Research Inc.; MAR: Managed Accounts Reports; CSFB/Tremont: Credit Suisse First Boston Tremont Index; TASS: Tremont; ZCM: Zurich Capital Markets. I: Hedge Funds indices; IF: Individual funds

may be able to outperform other managers.[23] But why should hedge funds be in a better position to attract skilled managers? As noted earlier, most mutual funds (and other money management firms) use a "flat fee" structure to compensate managers, whereas hedge funds typically employ an asymmetrical incentive fee structure.[24] Thus, skilled managers will be attracted to hedge funds because of the prospect of substantially higher compensation if the fund performs well, even though they may receive no compensation at all if the fund performs poorly. Further, most hedge fund managers invest in the fund, and are at risk of losing their own capital if the fund performs poorly. Thus, managers signal their greater skill level by starting (or joining) a hedge fund and agreeing to receive most of their compensation in a form that is tied directly to the performance of the fund. Unskilled managers, on the other hand, will be discouraged from starting hedge funds, or from masquerading as skilled managers, because of the high costs associated with failure. As a result, we might expect a higher level of manager skill to exist in the hedge fund industry, which could explain why hedge funds consistently outperform other funds and are able to earn excess returns.[25]

There is some evidence that this skill-sorting process does in fact take place. First, there has been an exodus of successful mutual fund managers to hedge funds, and several investment companies have had to launch their own hedge funds in an

23. See, for example, Sanford J Grossman and Joseph E. Stiglitz, "On the Impossibility of Informationally Efficient Markets," *American Economic Review*, Vol. 70, No. 3 (1980).

24. Under asymmetrical incentive contracts, managers typically receive a percentage of returns (such as 20%) above a specified "hurdle rate," such as the Treasury bill rate, but do not have to return funds (or pay back) if the fund underperforms. While mutual funds can employ symmetrical incentive fees, where fees decrease if managers underperform in the same way that they increase if the fund outperforms, few funds have adopted this kind of "fulcrum" fee structure.

25. Presumably, the excess returns that hedge funds earn are divided between investors and managers (in the form of higher compensation) depending on their relative bargaining power.

attempt to keep their best managers.[26] Second, the average lifespan of new hedge funds is quite short, consistent with the view that new hedge fund managers who are unskilled do not last long. Finally, there is some evidence that higher incentive fees are positively related to better hedge fund performance, consistent with the view that the incentive fee structure attracts more highly skilled managers.[27]

Another explanation of hedge fund success is what might be termed the "limits to arbitrage" theory.[28] To the extent that there are impediments to the flow (or entry) of capital into specific capital markets, asset mispricings may persist because of a shortage of "arbitrage capital." Such a shortage could even increase the risk of arbitrage because mispricing could widen before it narrows, discouraging potential arbitrageurs.

Hedge funds also earn excess returns because they employ investment strategies that mainstream investment institutions, such as mutual funds and pension funds, are unable to pursue due to regulatory constraints. First, there are severe restrictions on the ability of both open- and closed-end mutual funds to employ strategies involving short sales. Mutual funds are not permitted to engage in covered short sales unless they segregate liquid assets to cover their short position exposures, which is costly. This is a significant impediment to using short sales, which reduces competition and hence may increase the returns to funds that *are* permitted to pursue strategies employing short-selling, as is true of most hedge funds (through such strategies as "equity market neutral" or "convertible arbitrage").

Second, both open- and closed-end funds are severely restricted in their use of leverage, while hedge funds employ substantial amounts of both on- and off-balance sheet leverage. Open-end funds cannot leverage more than one-third of their total assets (equity plus debt), and closed-end funds cannot leverage more than one-half of their total assets. What's more, mutual funds must conform to "asset coverage" regulations associated with leveraged positions and designed to protect fund investors. These requirements make the use of extensive leverage less feasible for mutual funds than for hedge funds, which face no such restrictions. In fact, leverage is a significant component of most hedge fund strategies, enhancing their profits from relatively small market inefficiencies.

Third, there are limitations on the use of derivatives by mutual funds. Any potential exposure associated with a derivatives position triggers a substantial liquid asset requirement for a mutual fund. The use of illiquid derivatives instruments, including certain swaps, is also subject to the 15% portfolio limit on the holding of illiquid assets (open-end funds only). Hedge funds, however, make extensive use of derivatives.

Fourth, the "five-and-ten" rule imposes diversification and concentration restrictions on mutual funds that hedge funds do not face. In particular, at least 50% of a fund's total assets must satisfy the following two criteria: no equity position can exceed 5% of the value of the fund's total assets, and the fund cannot hold more than 10% of the outstanding securities of any company. (Closed-end funds are not subject to the diversification requirement.) The other 50% of the portfolio can be used to take at most two positions each representing 25% of the fund's portfolio. These restrictions discourage mutual funds from engaging in a strategy of taking large, illiquid positions in companies, something that hedge funds often do.

Finally, open-end mutual funds are more liquidity-constrained than hedge funds. In general, they are required to redeem their shares on a daily basis, and cannot delay the payment of redemption proceeds for more than seven days after the tender of shares offered for redemption. In recent years, some fund companies have started "interval" funds, which under the SEC's safe harbor provisions may enable them to redeem only quarterly, semiannually, or annually. But few mutual funds have adopted this structure because it limits investors in the fund to "qualified purchasers" under Section 2(a)(51) of the Investment Company Act and subjects the fund to additional liquidity requirements. Unlike hedge funds, then, open-end mutual funds face severe liquidity restrictions that prevent them from pursuing many of the strategies employed by hedge funds, which can "lock up" investors for long periods of time and can thus hold illiquid positions without being exposed

26. See "Hedge Funds' Heat Generates Allure for Mutual Firms," *The Wall Street Journal*, August 7, 2000, p. R1.

27. See Edwards and Caglayan (2001), cited earlier. While there is a possibility that this relationship is due to a reverse causality effect, this is unlikely because of the static nature of incentive fees. Hedge funds almost never change the incentive fee rate during the life of the fund.

28. See, for example, Andrei Shleifer and Robert W. Vishny, "The Limits of Arbitrage," *Journal of Finance*, Vol. 52, No. 1 (1997).

to the risk of refinancing those positions at inopportune times. As a result, hedge funds may be able to earn excess returns by operating in illiquid markets where there is a shortage of arbitrage capital.

CONCLUSION

Many hedge funds have posted strong returns even during the last few years when stock returns were plummeting. Because of their ability to provide high returns that are uncorrelated with the returns on other asset classes like stocks and bonds, hedge funds have attracted an increasing number of wealthy individuals and institutional investors. To the typical investor, however, the diversity of hedge fund investment strategies and the general opaqueness of their operations make the hedge fund industry a "black box." The purpose of our article is to unwrap this box in order to provide investors with a better understanding of what hedge funds do and how to evaluate their performance.

An understanding of the exempt legal status of hedge funds is critical to understanding how they differ from other investment institutions like mutual funds. We also describe the various investment strategies employed by hedge funds and discuss some general characteristics of these strategies, before turning to an evaluation of hedge fund performance. When viewed through the lens of traditional risk-adjusted measures of performance (such as Sharpe ratios), the performance of hedge funds appears very strong compared to traditional asset classes like stocks and bonds. However, data deficiencies in the reporting and collection of hedge fund returns somewhat reduce our confidence in all measures of hedge fund performance. More important, our inability to explain the returns of individual hedge funds with standard multifactor risk models leaves open the possibility that we are not properly measuring the risks associated with at least some hedge fund strategies. If so, we could be overstating the risk-adjusted returns earned by hedge funds.

With these caveats in mind, however, most research to date suggests that hedge funds do earn excess returns. We discuss several theories that can be used to reconcile this finding with the widely accepted paradigm of market efficiency, and conclude that the compensation structure for hedge fund managers may be effective in attracting more highly skilled professionals to that industry.

■ FRANKLIN R. EDWARDS

is Professor of Finance and Economics at the Columbia University Business School.

■ STAV GAON

is a Ph.D. candidate in Finance and Economics at the Columbia University Business School.

Appendix: Description of Hedge Fund Strategies

Hedge Fund Index	Description
Convertible Arbitrage	Purchase a portfolio of convertible securities, generally convertible bonds, and hedge a portion of the equity risk by selling short the underlying common stock. Most managers employ leverage, ranging up to 6:1, and the equity hedge ratio may range from 30% to 100%.
Distressed Securities	Invest in, and may sell short, the securities of companies whose security prices have been, or are expected to be, affected by a distressed situation such as a bankruptcy, distressed sale, or other corporate restructuring. Depending on the manager's style, investments may be in bank debt, corporate debt, trade claims, common stock, preferred stock, and warrants.
Emerging Markets	Invest in sovereign or corporate securities of developing or "emerging" countries. Investments are primarily long.
Equity Hedge	Consists of a core holding of long equities hedged at all times with short sales of stocks and/or stock index options. Where short sales are used, hedged assets may comprise an equal dollar value of long and short stock positions. Other variations use short sales unrelated to long holdings and/or puts on the S&P 500 index and put spreads. Conservative funds mitigate market risk by maintaining market exposure from zero to 100%. Aggressive funds may magnify market risk by exceeding 100% exposure and, in some instances, maintain a short exposure.
Equity Market Neutral	Exploit pricing inefficiencies between related equity securities, neutralizing exposure to market risk by combining long and short positions. One example is to build portfolios made up of long positions in the strongest companies in several industries and taking corresponding short positions in those showing signs of weakness.
Equity Market Neutral: Statistical Arbitrage	Utilize quantitative analysis of technical factors to exploit pricing inefficiencies between related equity securities, neutralizing exposure to market risk by combining long and short positions. Portfolios are typically structured to be market, industry, sector, and dollar neutral.
Equity Non-Hedge	Commonly known as "stock-pickers," funds that are predominantly long in equities; they do not always have a hedge in place, although they have the ability to hedge with short sales of stocks and/or stock index options.
Event-Driven	Also known as "corporate life cycle" investing, these funds invest in opportunities created by significant transactional events, such as spin-offs, mergers and acquisitions, bankruptcy reorganizations, recapitalizations, and share buybacks. The portfolio of some Event-Driven managers may shift in majority weighting between Risk Arbitrage and Distressed Securities, while others may take a broader scope.
Fixed Income: Arbitrage	Employ a variety of strategies involving investment in fixed income instruments, hedged to eliminate or reduce exposure to changes in the yield curve. The generic types of fixed income hedging trades include: yield-curve arbitrage, corporate versus Treasury yield spreads, municipal bond versus Treasury yield spreads, and cash versus futures.
Fixed Income: Convertible Bonds	Primarily long only convertible bonds.
Fixed Income: Diversified	Invest in a variety of fixed income strategies, including municipal bonds, corporate bonds, and global fixed income securities.
Fixed Income: High-Yield	Invest in noninvestment-grade debt.
Fixed Income: Mortgage-Backed	Invest in mortgage-backed securities, including government agency, government-sponsored enterprise, private-label fixed- or adjustable-rate mortgage pass-through securities, fixed- or adjustable-rate collateralized mortgage obligations (CMOs), real estate mortgage investment conduits (REMICs), and stripped mortgage-backed securities (SMBSs). Funds may look to capitalize on security-specific mispricings.
Macro	Take leveraged bets on anticipated price movements of stock markets, interest rates, foreign exchange, and physical commodities.

Appendix: Description of Hedge Fund Strategies (Continued)

Hedge Fund Index	Description
Market Timing	Invest at the beginning of an uptrend in prices, and then switch out of these investments at the start of a downtrend in prices.
Merger Arbitrage	Sometimes called Risk Arbitrage, involves investment in event-driven situations such as leveraged buy-outs, mergers, and hostile takeovers. These strategies generate returns by purchasing stock of the company being acquired, and in some instances, selling short the stock of the acquiring company.
Regulation D	Invest in Regulation D securities, sometimes referred to as structured discount convertibles. The securities are privately offered to the investment manager by companies in need of timely financing.
Relative Value Arbitrage	Attempt to take advantage of relative pricing discrepancies between instruments including equities, debt, options, and futures. Managers may use mathematical, fundamental, or technical analysis to determine misvaluations. Securities may be mispriced relative to the underlying security, related securities, groups of securities, or the overall market. Arbitrage strategies include dividend arbitrage, pairs trading, options arbitrage, and yield curve trading.
Short Selling	Involves the sale of borrowed securities (not owned by the seller) in order take advantage of an anticipated price decline.
Fund of Funds	Invest with multiple managers through a fund or a managed account. A Fund of Funds manager has discretion in choosing which strategies to invest in, and may allocate funds to numerous managers within a single strategy or to numerous managers in multiple strategies.
Managed Futures (CTA) Index	The Barclay CTA Index represents the returns on a diversified portfolio of commodity futures managed by commodity trading advisors (CTAs). The return index is unweighted and rebalanced at the beginning of each year. In 2003 there were 359 CTA programs included in the index. To qualify for inclusion in the index an advisor must have four years of prior performance history, and new programs are not added to the index until after their second year.
Managed Futures (BTOP 50) Index	The Barclay BTOP 50 Index represents the returns on the largest investable CTA programs, measured by assets under management. In each calendar year, these programs represent, in aggregate, at least 50% of the investable assets of all CTAs in the Barclay database.