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**Edited by Kenneth A. Reinert & Ramkishen S. Rajan:  
The Princeton Encyclopedia of the World Economy**

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(230): 163–84. Formalizes the Heckscher-Ohlin model and shows that trade would lead to the equalization of factor prices.

Stolper, Wolfgang, and Paul A. Samuelson. 1941. “Protection and Real Wages.” *Review of Economic Studies* 9 (3): 58–73. Shows that in the H-O model, the owners of the scarce factor are left unambiguously worse off by imports.

#### ARVIND PANAGARIYA

### ■ hedge funds

Hedge funds are broadly defined as private investment pools that are not available to the general public. They are more lightly regulated and have wider investment flexibility than public investment companies such as mutual funds, which pool money from many investors and invest in stocks, bonds, and other securities. Hedge funds can buy and sell securities in many financial markets, representing long and short positions, respectively. In addition, they can use leverage and derivatives, which are financial instruments whose value derives from some underlying asset or price.

The first hedge fund was started in 1949 by Alfred Winslow Jones, a financial journalist, who believed that this new investment style could deliver good returns with more stability than investments in stock mutual funds. The hedge fund industry has grown from 600 funds in 1990 to more than 8,500 in 2005. During the same period, total assets in hedge funds have grown from \$40 billion to more than \$1 trillion. This growth has been driven by the stable investment performance of the industry, especially when compared to the swings of the stock market. Because they pursue very active investment strategies, hedge funds are even more important than their asset size would suggest. As a result, hedge funds have become major players in international capital markets.

**Types of Hedge Funds** The hedge fund industry is much more heterogeneous than the mutual fund industry because of the greater latitude in investment style. Funds are typically classified into the following categories:

*Global macro* funds, which take positions in global markets (stocks, fixed-income investments, currencies, commodities);

*Long/short equity* funds, which buy and sell stocks;

*Equity market neutral* funds, where the long positions are exactly offset by short positions so as to create a zero, or neutral exposure to the stock market;

*Arbitrage* funds, which take long and short positions in securities such as fixed-income and convertible bonds;

*Event-driven* funds (merger arbitrage and distressed debt), which take positions driven by corporate events such as mergers, takeovers, reorganizations, and bankruptcies.

Long/short equity funds represent the largest sector of the industry, with approximately one-third of the funds.

**Investment Strategy** Consider a typical hedge fund, which has both long and short positions in stocks. Say the initial capital is \$100. This represents the equity, or net asset value. The fund buys \$100 worth of stocks and sells \$50 worth of other stocks. Short-selling is achieved by borrowing a stock and selling it in the hope that its price will fall later, at which time the stock can be bought back and transferred to the lender. In such case, the borrower keeps the difference between the (higher) earlier sales price for the stock and the (lower) later purchase price. In the event that the stock price goes up, however, the borrower loses the difference between the (lower) earlier sales price and the (higher) later purchase price.

This type of investment strategy (short-selling) has two advantages relative to mutual funds, which typically are allowed to have long positions only. First, it allows the hedge fund manager the flexibility to buy assets that are viewed as undervalued, for example, and sell assets that are overvalued. In contrast, the manager of a long-only fund cannot implement a view that an overvalued asset is going to fall in price, because the manager cannot short the asset.

Second, it has less exposure to the direction of the stock market (called *directional exposure*) than a long-only position. Indeed, to “hedge” a bet can be defined

as protecting against loss by taking a bet for a countervailing amount against the original bet. In hedge investing, the directional exposure to the market, also called *beta*, is reduced. As a result, the overall risk of loss is reduced as well. Hedge funds attempt to create risk-adjusted performance, also called *alpha*, without taking too much directional risk.

As an example, a manager could buy Google's stock because it is expected to go up by 25 percent, out of which 10 percent is due to the overall stock market and 15 percent to the company itself. The manager, however, is not confident about the direction of the stock market and is afraid the 10 percent expected profit on the market could turn into a loss. To hedge against a market fall, the purchase of Google is offset by a short position of the same size on the market. If the market falls by 10 percent, the transaction will create a profit of 15 percent minus 10 percent, for a 5 percent total gain on Google's stock, plus a gain of 10 percent on the stock market, for a total of 15 percent. Of course, if the market indeed goes up by 10 percent, the short position will lose 10 percent, leading to a net profit of 15 percent. Therefore, this hedge locks in a total profit of 15 percent irrespective of the market.

Another example of trading strategy that exploits inefficiencies in the market would be to identify two assets with similar characteristics, such as two long-term Treasury bonds with close maturities and similar interest rate risk. An *arbitrage* opportunity would arise if the bonds were to trade at sufficiently different prices. The hedge fund manager would then buy the cheap bond, say at \$99, and sell the expensive one, say at \$100. This position should create profits if the bond prices later converge. Even if successful, however, such strategy will produce only small profits, on the order of \$1 per transaction (after taking into account the costs of making the transaction). To magnify profits, the hedge fund will typically use *leverage*. This involves the use of credit to increase the size of the position relative to the equity. For instance, the hedge fund with \$100 in equity could be buying and selling \$990 and \$1,000 worth of bonds (using 10 percent equity and 90 percent credit), which will multiply the profit by a factor of 10.

This wider investment flexibility combined with hedging has proved successful. Hedge funds have generally performed well relative to other investments, especially when adjusting for risk. For fund managers, hedge funds provide greater remuneration than traditional investment funds. Typical investment management fees for mutual funds range from a fixed 0.5 percent to 2 percent of asset value. In contrast, hedge funds commonly charge a fixed 2 percent of assets plus 20 percent of positive returns.

Other categories of hedge funds include *multi-strategy funds*, which invest across the categories listed earlier, and *funds of funds*, which invest in individual hedge funds.

**Investment Issues** Hedge funds take risks in the expectation of high profits. Because of the leverage inherent in most hedge funds, this naturally leads to failures. Leverage increases the profits, but also the risks. In our previous example, a leverage of 10 transforms a profit of \$1 into \$10. On the other hand, a loss of \$1 now becomes \$10. In the limit, a very large loss of \$10 becomes \$100, wiping out the \$100 equity. Indeed, hedge funds have a high rate of disappearance, from 5 to 11 percent per year. In most cases, this reflects an investment or operational failure that leads to the closing down of the fund. Mutual funds also fail, but less frequently.

Hedge funds present some specific problems not shared by mutual funds. Because hedge funds often invest in assets that are not traded on organized exchanges such as the New York Stock Exchange, some positions can be difficult to value. Thus the proper *valuation* of assets is a major issue for hedge funds. Assets that are not traded often are called illiquid.

*Illiquidity* explains the common practice of imposing a lockup period, which is the minimum amount of time during which investor money is to be held in the fund, and a redemption notice period, which is the time required to notify the fund of an intended redemption. Lockup periods average 3 months, and can extend to 5 years; redemption notice periods average 30 days.

Another problem with hedge funds is the *lack of transparency*. Because hedge funds follow proprietary trading strategies, they are generally reluctant to re-

veal information about their trading ideas or positions. Having no information about positions has serious disadvantages for investors. It becomes difficult to monitor the risk of the fund, to aggregate the risk profile of the fund with the rest of the investor's portfolio, or even to detect fraud.

**Regulatory Issues** The rapid growth of hedge funds has led to regulatory concerns on several issues. One is the *protection of investors*. Investors can lose money in hedge funds. Direct investment in hedge funds, however, is restricted to professional investors, such as wealthy individuals, pension funds, endowment funds, and other institutional investors. The general presumption is that such investors are conscious of the investment risk they take and can therefore fend for themselves. Also, hedge fund managers generally have significant personal investments in the fund, which partially aligns their interest with that of other investors.

*Fraud* is another concern. Fraud occasionally occurs in all investment activities, and there is no evidence that hedge fund advisors engage disproportionately in fraudulent activities. Even so, there have been some high-profile cases of hedge fund fraud which, combined with the rapid growth of the industry, have led regulators to look more closely at hedge funds.

Another issue is *protecting market integrity*. Market participants should not attempt to dominate or manipulate markets. Like other large investors, hedge funds are subject to rules against market manipulation.

Regulators also worry about the potential for *systemic risk*. Systemic risk arises when default by one institution has a cascading effect on other financial institutions (the first institution's default being of such a magnitude as to cause the failure of its creditors, which in turn default on their obligations to other institutions, and so on), thus posing a threat to the stability of the entire financial system. Indeed, the spectacular failure of the hedge fund Long-Term Capital Management (LTCM) in 1998 is said to have endangered the world financial system. LTCM was a hedge fund founded in 1994 by John Meriwether, the former head of bond trading at Salomon

Brothers. The fund lost \$4.4 billion in 1998, forcing the Federal Reserve Bank to organize a private bailout to avoid disruptions in financial markets.

The primary mechanism for regulating hedge fund risk is the discipline provided by creditors, counterparties, and investors. The leverage of the hedge fund industry is provided by counterparties such as banks and brokerage firms. It is in these lenders' best interest to make sure that loans to hedge funds are controlled and have sufficient collateral. Holding collateral can provide effective protection against default. The LTCM crisis revealed lax lending standards. Since then, however, the Counterparty Risk Management Policy Group (2005) has reported a general improvement in counterparty risk management practices.

**Role of Hedge Funds** Hedge funds have become important conduits of capital in international financial markets. Like any other speculator trading in the expectation of making profits, hedge funds enhance market liquidity by generating more trading activity, leading to deeper and more liquid markets. In addition, many hedge funds use relative value strategies, which buy underpriced assets and sell overpriced ones. These actions should help to push prices faster to their equilibrium values, which enhance market efficiency.

**See also** capital mobility; carry trade; hedging; speculation

#### FURTHER READING

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#### PHILIPPE JORION

### ■ hedging

*Hedging* refers to the reduction of an existent risk by the elimination of exposure to price movements in an asset. Hedging stabilizes markets since it removes potential shocks to balance sheets that can destabilize the financial system. Also, if hedging is complete at the aggregate level, long and short positions can be matched with less price volatility. Those taking a short position want to sell an asset because they believe its price is going to fall, while those going long want to buy it since they expect a rise in the asset price. Unhedged short-term foreign borrowing played a major role in escalating the East Asian crisis of 1997–98.

Currency risk is hedged through contracts that protect the home currency value of transactions denominated in a foreign currency, removing the exposure to exchange rate fluctuations. The currency risk is transferred to another party who wants to take an exposure in opposite direction.

The value of a derivative hedging contract is based on the underlying basic spot exchange rate. Standardized contracts are available, or customized (over-the-counter, or OTC) contracts can be designed. An

Indian exporter, for example, can sell the dollars due to him in the future on the dollar-rupee forward market, through a forward contract or an agreement to sell the dollars at a certain future rate for a certain price reflecting current prices. Hedging can also be accomplished informally, for example, if an exporter takes a foreign loan. Then if the home currency depreciates he will gain in export income but lose as the home currency value of his debt rises, so that his net exposure is low.

**Hedging versus Speculation** If the exporter does not sell the future dollars forward, thus entering into only one leg of a foreign currency transaction, he is speculating on a belief the rupee is going to depreciate. He may also take a short position on the rupee using derivative products. Speculation is the act of aiming to profit by betting on a predicted one-way price movement. Thus it is risk-taking, not risk-reducing. It is sometimes argued that since speculators buy when prices are low and sell when prices are high, rational speculative activity stabilizes markets. But this does not always follow, since speculators buy when there is a high probability of price appreciation and sell when the probability is low, and thus can cause cumulative movements.

Buying and selling currency in the spot market requires an initial cash payment. Forward contracts require no such initial payment, but can lead to a gain or a loss in the future transaction depending on changes in the exchange rate. Therefore, forward markets provide extra leverage to a speculator in comparison to spot markets. Options, another type of derivative, increase the leverage further since they confer a right but not an obligation to make a transaction. The option has an initial cost but then does not require buying or selling currency either in spot or in the forward market. Therefore it provides even higher leverage, at a price.

**Incentives to Hedge** Hedging does not necessarily rise with the availability of more market instruments, since the same derivative can be used for hedging or for speculation leveraging initial capital many times. Incentives to induce hedging are more important. Markets, instruments, and opportunities,