UBS

Hedge funds education

Merger Arbitrage

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- Merger arbitrage belongs to equity event-driven strategies.
- These strategies focus on corporate mergers and acquisitions rather than market direction, and aim to capitalize on deal spreads.
- Historically, merger arbitrageurs have produced lower drawdowns and volatility than other strategies.

Merger arbitrage in a nutshell

- Equity event-driven managers aim to exploit trading opportunities in equity markets arising from corporate events.
- The most common form of these strategies is merger arbitrage, which focuses on trading opportunities occurring in the event of corporate mergers and acquisitions (M&A).
- Managers typically invest in numerous deals to hedge the risk of individual deals falling through. Some focus on specific industries while others focus on diversifying across industries.
- Mergers can be cash deals, in which the acquiring company offers cash for the target company's stock, or stock deals, in which the acquirer offers to exchange its own shares for those of the target company based on a specified ratio – fixed or floating. More complex merger offers might include other corporate securities.
- Drivers of merger arbitrage performance predominantly include M&A activity and arbitrageurs' ability to correctly predict the outcome of a deal. The risk-free rate and the overall trading environment for equity markets can also affect returns.
- Over the past 20 years, merger arbitrage strategies have shown significantly lower volatility than equity markets with only slightly lower annualized performance. Importantly, the maximum drawdown of these strategies is significantly less than that of equities.
- Historically, merger arbitrage strategies have been resilient to changes in the business cycle. In three out of four phases – expansion, slowdown and recovery – they have delivered solid returns, albeit lower than the broad hedge fund index.
- From a portfolio perspective, merger arbitrage is a good diversifier owing to its fairly low volatility and relatively lower risk. It can also be used as downside protection in times of market dislocations.
- Return variability among managers is rather low, stemming from the more defensive nature of the strategy.
- Besides general hedge fund risks, a key risk for these strategies is transaction-based, i.e., a merger or acquisition is not completed after a position has been taken by a manager.

Source: Fotolia

This report is part of a series of short primers on specific hedge fund strategies. You will find more information on the client portal. You can also contact your advisor for assistance.

Merger arbitrage in a nutshell

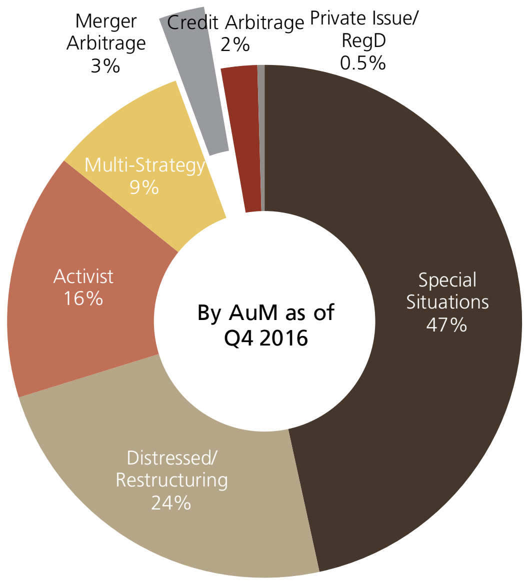
7.0%	Annualized average return
4.4%	Annualized average excess return over 3-month cash
3.5%	Annualized average volatility
-8%	Maximum drawdown
0.59	Correlation to global equities
0.10	Correlation to global bonds
1.3	Sharpe ratio

Source: HFR, Bloomberg, UBS; based on historical data since 1995; indices used include MSCI World TR, Barclays Global Aggregate Bond TR and HFRI Merger Arbitrage Index

What do merger arbitrage funds do?

- Equity event-driven managers aim to exploit trading opportunities in equity markets arising from corporate events. One of the most well-known equity event-driven strategies is merger arbitrage, also known as risk-arbitrage, a strategy focused on trading opportunities occurring in the event of corporate mergers and acquisitions.
- In its most simple form, a merger arbitrageur would purchase the stock of a target company while simultaneously shorting the stock of the acquiring company – a fixed exchange ratio stock deal – following the announcement of a merger/acquisition.
- This "market neutral" transaction enables merger arbitrageurs to capture the deal spread assuming the successful completion of the merger/acquisition.
- The deal spread, or arbitrage spread, is the difference between the market price of the target company and the offered acquisition price.
- Mergers can be cash deals, in which the acquiring company offers cash for the target company's stock, or stock deals, in which the acquirer offers to exchange its own shares for those of the target company based on a specified ratio – fixed or floating. More complex merger offers might include other corporate securities.
- Managers predominantly use securities instruments such as stocks, derivatives and in some cases even fixed-income instruments.
- They typically invest in a large number of deals to hedge the risk of individual deals falling through – often over 100 positions. However, depending on their conviction, they can overweight some positions.
- Managers often make use of leverage.
- Some focus on specific industries they have detailed knowledge of, while others focus on diversifying across industries.
- Merger arbitrageurs can also implement broad macro hedges on their overall portfolio of stocks, generally achieved through index options or futures.

Fig. 1: Event-driven breakdown by sub-strategy
Merger arbitrage represents a small % of the equity event-driven universe



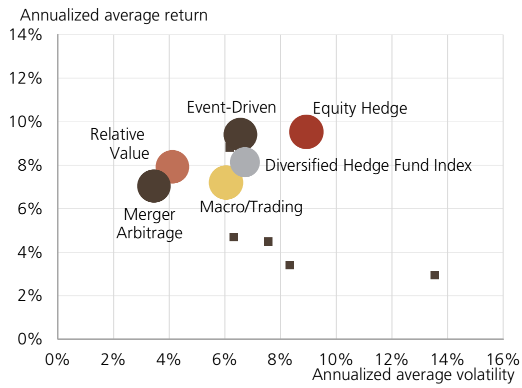
Source: HFR, UBS; as December 2016

Sources of strategy returns

Merger arbitrage hedge fund managers have four potential return streams: manager alpha, equity market beta, alternative beta and the risk-free rate.

- **Alpha:** Manager's skill to employ an investment strategy that generates returns in excess of broad market performance. Specifically, predicting the likelihood of a deal being completed successfully. As such, their ability to gather and analyze large amounts of data – from merger financing, regulatory considerations or shareholder sentiment – faster and with more detail than others is paramount to the successful merger arbitrageur. Based on the evolution of the deal, managers must be able to trade, expand or contract their positions to take advantage of changing circumstances.

Fig. 2: Risk/return scatterplot of various hedge fund strategies



Note: Event-driven sub-strategies are represented in squares

Source: HFR, UBS; based on historical data since 1995

- **Market beta:** refers to broad market movements. While merger arbitrage managers generally aim at maintaining a market neutral position, time delays or sudden market movements can cause deals to collapse, leading to significant losses.
- **Alternative beta:** refers to other return streams not linked to manager skill (alpha) or to broad market performance (market beta). Also referred to as risk premiums, alternative betas are recurrent market anomalies that hedge fund managers can exploit. In the case of merger arbitrage the alternative beta refers to the existence of a deal spread for announced mergers and acquisitions – such as the return of buying all announced deals and holding them until completion or failure of the merger/acquisition. The proven long-term success of this passive investment strategy can be attributed to the liquidity premium and insurance against deal risk that merger arbitrageurs provide to the market.
- **Risk–free rate:** merger arbitrage spreads are linked to the risk-free rate as each individual deal spread reflects the risk-free rate plus the deal risk.

Performance analysis

- From 1995 to 2017, merger arbitrage strategies posted an average annualized performance of 7.0% with a volatility of 3.5%, based on the HFRI Merger Arbitrage Index.
- While the performance is moderately weaker than that of equities, the volatility is only about one-fourth as high.
- Broadly diversified merger arbitrage portfolios also show significantly lower maximum drawdowns of only -8.1% as opposed to -50.9% for equities.

Merger arbitrage in your portfolio

- Over the past 20 years, the correlation of merger arbitrage with traditional assets such as equities and bonds stood at 0.59 and 0.1, respectively.
- While correlation to equity markets may appear high historically, it has a very low sensitivity to broader market movements (beta of about 0.14).
- In the portfolio context, merger arbitrage funds are considered good diversifiers, reducing volatility without dampening overall returns.
- Additionally, the strategy can help mitigate downside risks during market dislocations. It represents a defensive strategy if investments are sufficiently diversified across various managers.

Merger arbitrage and the business cycle

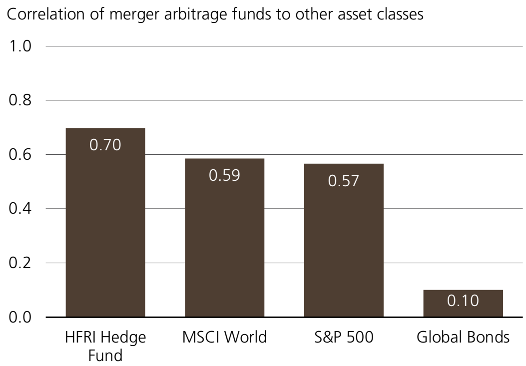
- In three out of four phases of the cycle – expansion, slowdown and recovery – merger arbitrage strategies have delivered solid returns on an annualized basis.
- Interestingly, during recession phases, merger arbitrageurs show a capacity to mitigate downside risks substantially, though still experiencing net losses.

Table 1: Performance analysis (1995–2017)
Merger arbitrage strategies historically delivered superior risk-adjusted returns over equities

	100% Equities	100% Merger Arbitrage	50% Bonds 50 % Equities	20% Merger Arbitrage 40% Bonds 40% Equities
Performance (ann.)	9.7%	7.0%	7.7%	7.6%
Volatility (ann.)	14.8%	3.5%	8.3%	7.0%
Sharpe Ratio (2.6%)	0.48	1.27	0.61	0.71
Maximum Drawdown	-50.9%	-8.1%	-29.0%	-24.9%

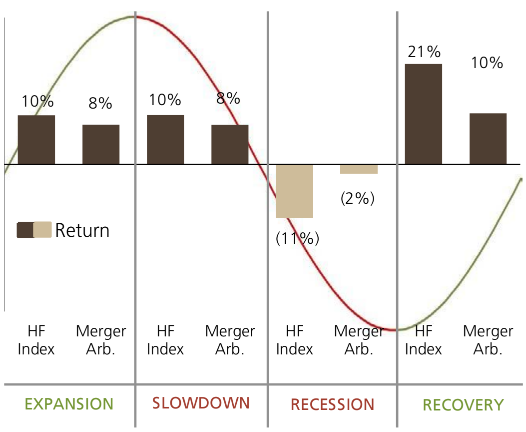
Note: Indices used include S&P 500 TR, Barclays Global Aggregate Bond TR and HFRI Merger Arbitrage Index. Source: HFR, Bloomberg, UBS; as of May 2017

Fig. 3: Correlation analysis (1995–2017)
Managers show moderate correlation to equities



Note: Indices used include MSCI World, S&P 500 TR, Barclays Global Aggregate Bond TR, HFRI Fund Weighted Index and HFRI Merger Arbitrage Index. Source: HFR, Bloomberg, UBS; as of May 2017

Fig. 4: Merger arbitrage in different cycle phases
Managers tend to perform well throughout the business cycle



Note: Cycle phases are defined based on global industrial production. Data since 1995. Source: HFR, UBS; as of May 2017

- One reason for these losses is that, although a market-neutral strategy, during recession phases, market beta can have secondary knock-on effects on merger arbitrage strategies, causing multiple deals to collapse and merger spreads to widen.
- This has a detrimental effect on managers, especially those that are not sufficiently diversified. In these periods, manager's risk skills and sector knowledge become paramount to avoid heavy losses.

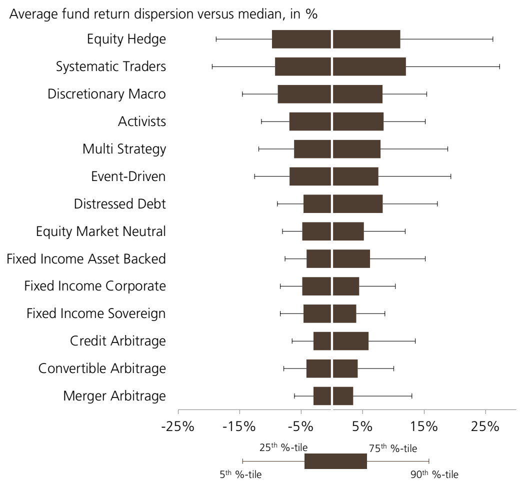
Variability of returns between managers

- Merger arbitrage shows significantly lower variability of returns when compared to other hedge fund strategies.
- Return dispersion between managers is lower than industry average due to the less aggressive nature of the strategy relative to other hedge fund strategies – this is driven by the lower volatility in the strategy.
- The large and diversified holdings of most managers, many of whom are involved in similar deals, also somewhat dampens the potential for variability in returns.
- Interestingly, the median return dispersion for merger arbitrage managers is positive.

What are the risks?

- Transaction risk is a primary risk for equity event-driven managers. Various factors can influence the outcome of a deal and ultimately returns – these include the type, the size and the time to completion of the deal, the involvement of regulators, and/or the ownership of the target company.
- Calendar risk increases the longer a deal takes to complete as delays, regulatory intervention, renegotiation, counter-bids and unexpected market shocks become more likely.
- Merger arbitrage spreads may widen significantly during periods of severe market dislocations due to heightened uncertainty and capital withdrawals.
- Other, more general hedge fund risks also apply, including the potential illiquidity of the fund and the lack of transparency of some managers, which could be used to mask fraud and operational risks such as improper risk management and/or leverage. These risks cannot be fully eliminated, but can be reduced significantly through thorough due diligence and strict investment and monitoring processes.

Fig. 5: Average fund return dispersion
Compared to other single strategies, merger arbitrage funds exhibit the weakest fund return dispersion



Source: HFR, UBS; data since 1990

Glossary

Selected definitions

- **Activists:** An individual or group that purchases large numbers of a public company's shares and/or tries to obtain seats on the company's board with the goal of effecting a major change in the company. A company can become a target for activist investors if it is mismanaged, has excessive costs, could be run more profitably as a private company or has another problem that the activist investor believes it can fix to make the company more valuable.
- **Alpha:** the premium an investment portfolio earns above a certain benchmark (such as the Standard & Poor's 500). A positive alpha indicates that the investor earned a premium over that index. In terms of stocks; a positive alpha is viewed as a stock being undervalued in relation to other stocks with similar systematic risk. In terms of portfolios; a description of the extraordinary reward obtained from the portfolio. The better the management of the portfolio, the more positive the alpha.
- **Alternative beta:** recurrent market anomalies that hedge fund managers exploit. Also referred to as risk premiums.
- **Annualized average excess return:** the average returns of a hedge fund, exceeding the benchmark or index, averaged over the lifetime of the fund.
- **Annualized average return:** the return provided by a hedge fund, averaged out to give a single number. this gives no indication of the volatility of the fund.
- **Arbitrage opportunities:** an opportunity to profit from price differences in an asset class which arise from market inefficiencies.
- **Arbitrage spreads:** the difference between the market price of the target company and the offered acquisition price.
- **Beta:** the measurement of a dependent variable's (i.e. stock price) volatility relative to an independent variable (i.e. an index). Beta is the percent change in the price of the dependent variable given a 1% change in the independent variable. This reveals if the dependent variable moves in step with the independent variable; where a beta of 1 indicates perfect alignment. Beta is a measure of risk; the higher the beta, the higher the risk.
- **Cash deals:** a merger deal in which the acquiring entity pays cash for the stock of the target company.
- **Correlation:** the degree to which the fluctuations of one variable are similar to those of another.
- **Drawdown:** the peak-to-trough decline during a specific record period of an investment, fund or commodity. A drawdown is usually quoted as the percentage between the peak and the trough.
- **Equity hedge:** a hedge fund strategy that involves buying certain stocks long and selling others short. There usually isn't a restriction on the country that the stocks trade in either.
- **Equity market neutral:** a hedge fund strategy that seeks to exploit differences in stock prices by being long and short in stocks within the same sector, industry, market capitalization,

country, etc. This strategy creates a hedge against market factors.

- **Equity return dispersion:** the variability of expected and realized returns on equities
- **Event driven:** a strategy, adopted by hedge fund managers, that attempts to take advantage of events such as mergers and restructurings that can result in the short-term mispricing of a company's stock. An event-driven strategy focuses on exploiting the tendency of the equities of companies in a time of change to drop in price.
- **Futures:** a financial contract obligating an entity to buy an asset (or vice-versa) at a price determined upon the sale of the futures contract.
- **Leverage:** the use of borrowed capital or instruments to increase the potential return (but also potential losses) of an investment, a simple example is a mortgage used in real estate transactions.
- **Liquidity premium:** the premium that an investor can demand depending on how easily the underlying security can be converted to cash.
- **Market neutral strategy:** A strategy undertaken by an investor or an investment manager that seeks to profit from both increasing and decreasing prices in a single or numerous markets.
- **Options:** an option is a contract which gives the buyer (the owner or holder) the right, but not the obligation, to buy or sell an underlying asset or instrument at a specified strike price on or before a specified date, depending on the form of the option.
- **Restructuring:** Restructuring is the corporate management term for the act of reorganizing the legal, ownership, operational, or other structures of a company for the purpose of making it more profitable, or better organized for its present needs.
- **Risk free rates:** the theoretical rate of return of an investment with zero risk.
- **Sharpe ratio:** is measure for calculating risk adjusted return. It is the average return earned in excess of the risk-free rate per unit of volatility or total risk.
- **Short sales:** the strategy of borrowing a security and selling it on in anticipation that the share price will drop, earning the seller the difference on the sale price against the later purchasing price.
- **Special situation:** Particular circumstances involving a security that would compel investors to trade the security based on the special situation, rather than the underlying fundamentals of the security or some other investment rationale. An investment made due to a special situation is typically an attempt to profit from a change in valuation as a result of the special situation, and is generally not a long-term investment.
- **Stock deals:** a merger deal in which the acquiring entity offers to exchange it owns shares for those of the target company based on a specified and agreed upon ratio.

Source: Bloomberg, UBS

Non-Traditional Assets

Non-traditional asset classes are alternative investments that include hedge funds, private equity, real estate, and managed futures (collectively, alternative investments). Interests of alternative investment funds are sold only to qualified investors, and only by means of offering documents that include information about the risks, performance and expenses of alternative investment funds, and which clients are urged to read carefully before subscribing and retain. An investment in an alternative investment fund is speculative and involves significant risks. Specifically, these investments (1) are not mutual funds and are not subject to the same regulatory requirements as mutual funds; (2) may have performance that is volatile, and investors may lose all or a substantial amount of their investment; (3) may engage in leverage and other speculative investment practices that may increase the risk of investment loss; (4) are long-term, illiquid investments, there is generally no secondary market for the interests of a fund, and none is expected to develop; (5) interests of alternative investment funds typically will be illiquid and subject to restrictions on transfer; (6) may not be required to provide periodic pricing or valuation information to investors; (7) generally involve complex tax strategies and there may be delays in distributing tax information to investors; (8) are subject to high fees, including management fees and other fees and expenses, all of which will reduce profits.

Interests in alternative investment funds are not deposits or obligations of, or guaranteed or endorsed by, any bank or other insured depository institution, and are not federally insured by the Federal Deposit Insurance Corporation, the Federal Reserve Board, or any other governmental agency. Prospective investors should understand these risks and have the financial ability and willingness to accept them for an extended period of time before making an investment in an alternative investment fund and should consider an alternative investment fund as a supplement to an overall investment program.

In addition to the risks that apply to alternative investments generally, the following are additional risks related to an investment in these strategies:

- Hedge Fund Risk: There are risks specifically associated with investing in hedge funds, which may include risks associated with investing in short sales, options, small-cap stocks, "junk bonds," derivatives, distressed securities, non-U.S. securities and illiquid investments.
- Managed Futures: There are risks specifically associated with investing in managed futures programs. For example, not all managers focus on all strategies at all times, and managed futures strategies may have material directional elements.
- Real Estate: There are risks specifically associated with investing in real estate products and real estate investment trusts. They involve risks associated with debt, adverse changes in general economic or local market conditions, changes in governmental, tax, real estate and zoning laws or regulations, risks associated with capital calls and, for some real estate products, the risks associated with the ability to qualify for favorable treatment under the federal tax laws.
- Private Equity: There are risks specifically associated with investing in private equity. Capital calls can be made on short notice, and the failure to meet capital calls can result in significant adverse consequences including, but not limited to, a total loss of investment.
- Foreign Exchange/Currency Risk: Investors in securities of issuers located outside of the United States should be aware that even for securities denominated in U.S. dollars, changes in the exchange rate between the U.S. dollar and the issuer's "home" currency can have unexpected effects on the market value and liquidity of those securities. Those securities may also be affected by other risks (such as political, economic or regulatory changes) that may not be readily known to a U.S. investor.

Appendix

Version as per May 2017.