

# Introduction to Merger Arbitrage

**A**rbitrage is one of the oldest forms of commercial activity. One of the earliest published definitions of the term *arbitrage* can be found in Wyndham Beaves's seminal *Lex Mercatoria*,<sup>1</sup> first published in 1685, which trained several generations of European merchants until its last edition of 1803. One will be hard pressed to find a finance book today that has been in print for over a century. In the 1734 edition, Beaves writes about arbitrage:

*ARBITRATION (a Construction of the French Word Arbitrage) in Exchanges has been variously defined by the several Authors who have treated of it.*

*One says it is a Combination or Conjunction made of many Exchanges, to find Out what Place is the most advantageous to remit or draw on.*

*Another describes it, by saying it is only the Foresight of a considerable Advantage which a Merchant shall receive from a Remis or Draught, made on one Place preferably to another.*

*A third construes it to be a Truck which two Bankers mutually make of their bills upon different Parts, at a conditional Price and Course of Exchange.*

*According to a fourth, it is the Negotiation of a Sum in Exchange, once or oftener repeated, on which a Person does not determine till after having examined by several Rules which Method will turn best to Account.*

*Lex Mercatoria*, 1734, p. 387

Around that time also appeared in Basel the first book dedicated to arbitrage, J. Wiertz's 1725 oeuvre *Traite des Arbitrages de Change*,<sup>2</sup> which discusses various calculation methods to convert one currency into another. All of these early forms of arbitrage involved currency arbitrage. Patrick Kelly describes a typical nineteenth-century arbitrage in his 1811 book *The Universal Cambist, and Commercial Instructor: Being a General Treatise on Exchange, Including the Monies, Coins, Weights and Measures of All*

*Trading Nations and Their Colonies: with an Account of Their Banks and Paper Currencies*,<sup>3</sup> which took over from Beaves's *Lex Mercatoria* as the obligatory text book for merchants in the nineteenth century:

#### *Arbitration of Exchange*

*Arbitration of Exchange is a comparison between the course of exchange of several places, in order to ascertain the most advantageous method of drawing or remitting Bills. It is distinguished into simple and compound arbitration: the former comprehends the exchanges of three places only, and the latter of more than three places.*

##### *Simple Arbitration*

*Is a comparison between the exchanges of two places with respect to a third—that is to say, it is a method of finding such a rate of exchange between two places as shall be in proportion with the rates quoted between each of them and a third place. The exchange thus determined is called the Arbitrated Price, and also Proportional Exchange.*

*If, for example, the course between London and Paris be 24 Francs for £1 sterling, and between Paris and Amsterdam 54d. Flemish for 3 Francs, (that is, 36s. Flemish for 24 Francs,) the arbitrated price between London and Amsterdam through Paris, is evidently 36s. Flemish for £1 sterling; for as 3 Fr. : 54d. Flem. :: 24 Fr. : 36s. Flem.*

*Now, when the actual or direct price (as seen by a quotation of otherwise advised) is found to differ from the arbitrated price, advantage may be made by drawing or remitting indirectly; that is, by drawing on one place through another, as on Amsterdam through Paris; [...]*

*To exemplify this by familiar illustrations, suppose the arbitrated price between London and Amsterdam to be, as before stated, 36s. Flemish for £1 sterling; and suppose the direct course, as given in Lloyd's list, to be 37s. Flemish, then London, by drawing directly on Amsterdam, must give 37s. Flemish for £1 sterling; whereas, by drawing through Paris he will give only 36s. Flemish for £1 sterling; it is, therefore, the interest of London to draw indirectly on Amsterdam through Paris.*

As securities markets began to develop and expand globally during the nineteenth century, arbitrage began to expand beyond simple currency exchanges. This is reflected in how Otto Swoboda expands the definition

of arbitrage in his book *Börse und Actien*, first published in Cologne in the year 1869:<sup>4</sup>

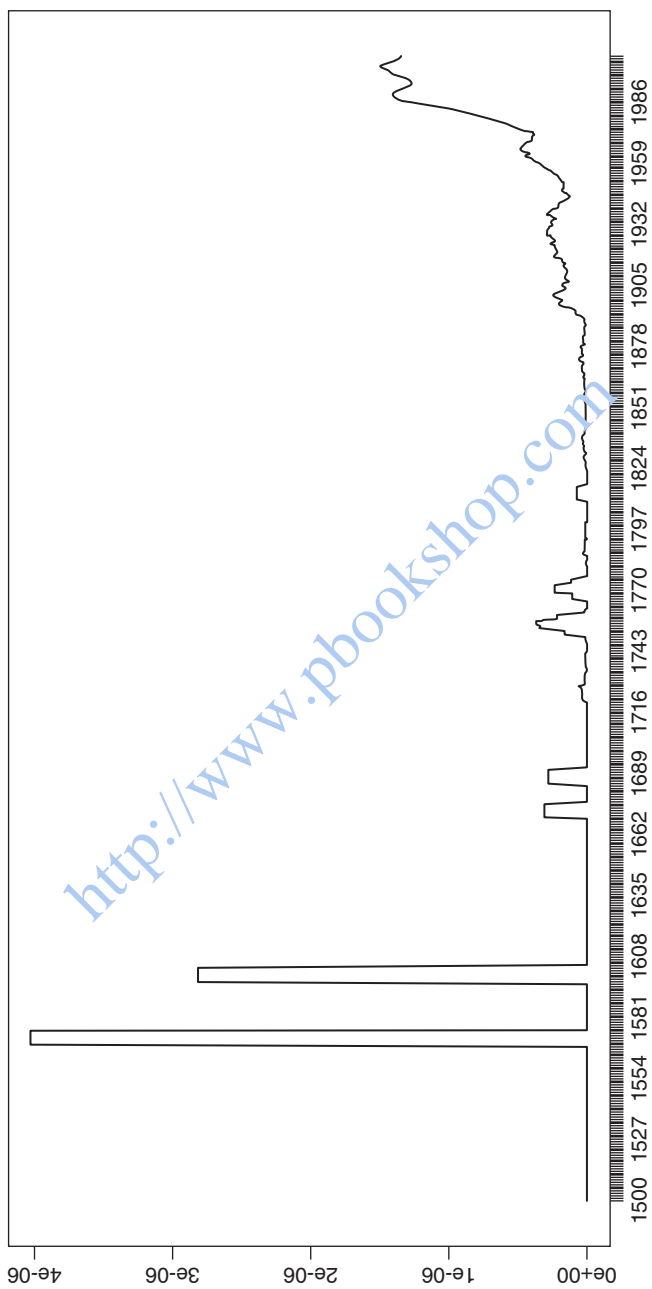
*Under arbitrage, that is decision, we understand the comparison of notations of any one place with those of another in order to use any arising difference, relative to exchange rates as well as security quotes, and thereby those who enter into such arbitrages (bring together) differences in prices between to places in their favor. [...] Early arbitrages occurred only in exchange rates, and only when a merchant owed another in a different location a certain amount or had a claim. He would then compare quotations in different places to see in which it would be most favorable to cover the debt or cover the claim. Only later a trade of its own developed from this, so that even without preceding commerce a speculation in currencies or funds was effected.*

The analysis of  $n$ -grams of books digitized by Google in Figure 1.1 shows the occurrence of the term *arbitrage* in printed books over time. In the early days of book printing, *arbitrage* appears to have been used frequently. However, it is the comparatively small number of books in print then that inflates the relative use of this term.

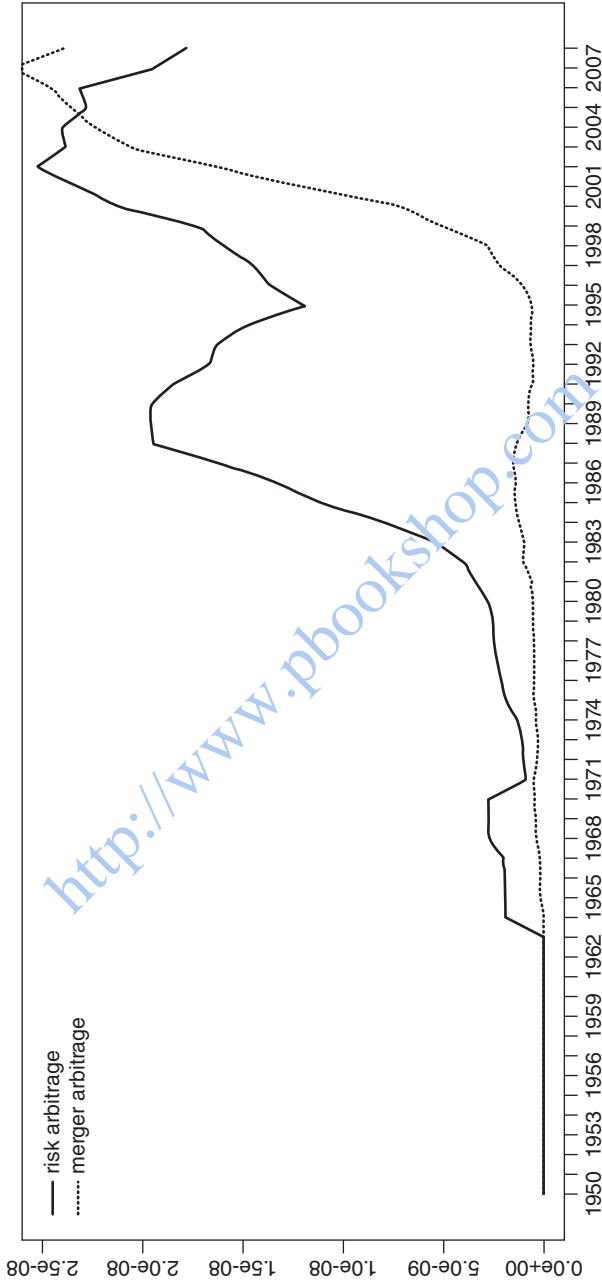
It is not until another century later, the 1960s, that *merger arbitrage* first appears in print, followed by *risk arbitrage* a few years later. The analysis of  $n$ -grams in Figure 1.2 shows the explosive growth of the usage of these terms since then. It is no surprise that the late 1960s gave rise to growing interest in arbitraging mergers, as this coincided with a wave of aggressive merger activity in England and the United States, which led to the adoption of many laws still in place today, such as the City Code. This will be discussed in more detail later. While *risk arbitrage* dominated as a description of the strategy discussed in this book for many years, *merger arbitrage* became more popular as a term in the late 1990s, and has surpassed *risk arbitrage* as the dominant term since the year 2005.

Unfortunately, the early descriptions of arbitrage are echoed in many modern-day definitions. *Merriam-Webster's 11th Collegiate Dictionary* defines it as:

1. *The nearly simultaneous purchase and sale of securities or foreign exchange in different markets in order to profit from price discrepancies*
2. *The purchase of the stock of a takeover target especially with a view to selling it profitably to the raider*



**FIGURE 1.1** Frequency of the Occurrence of the Term *Arbitrage* in Printed Books



**FIGURE 1.2** Frequency of the Occurrence of the Terms *Merger Arbitrage* and *Risk Arbitrage* in Books

While the second definition in Merriam-Webster relates to the subject matter at hand in this book, both definitions fail to capture all the different facets and breadth of arbitrage properly. In a world of instant global communications, the first type of arbitrage is rarely viable. A much better definition of arbitrage is that used by economists, who define arbitrage as a “free lunch”: an investment strategy that generates a risk-free profit. Academic finance theory formalizes this definition as a self-financing trading strategy that generates a positive return without risk. Three different degrees of arbitrage can be distinguished, as shown in Table 1.1.

A simple location arbitrage in commodities would be the purchase of crude oil in Rotterdam, the rental of a tanker, and the simultaneous resale of the oil in New York. Today, most arbitrage activity occurs in financial markets. An arbitrageur might take positions in a currency spot rate, forward rate, and two interest rates. Arbitrage transactions of this type are known as cash-and-carry arbitrage. This type of arbitrage can be understood easily as the purchase of oil and the simultaneous sale of an oil futures contract

**TABLE 1.1** Orders of Arbitrage

Degree	Definition	Example
First order	A strong, locked-in mechanical relationship in same instrument	Currency triangular arbitrage Location arbitrage Conversions and reversals for European options Crush and crack
Second order	Different instruments, same underlying security	Cash-future arbitrage Program trading Delivery arbitrage Distributional arbitrage (option spreading) Stripping
Second order	Different (but related) underlying securities, same instrument	“Value” trading Bond arbitrage Forward trading Volatility trading
Third order	Different securities, different instruments, deemed to behave in related manner (correlation-based hedging)	Bond against swaps (asset spread) Cross-market relationships Cross-volatility plays Cross-currency yield curve arbitrage

Source: Nassim Taleb, *Dynamic Hedging: Managing Vanilla and Exotic Options* (New York: John Wiley & Sons, Inc., 1997). Reprinted with permission of John Wiley & Sons, Inc.

for the delivery of that oil at a later time. (An arbitrageur would also have to arrange for storage.) In practice, few such simple arbitrage opportunities are available in today's markets. The key idea in arbitrage is the absence of risk. Arbitrageurs eliminate risk by taking positions that in the aggregate offset each other and compensate arbitrageurs for their efforts with a profit. Arbitrageurs are often referred to affectionately through the abbreviation "arb."

Arbitrage in general plays an important economic function because it makes markets more efficient. Whenever a price discrepancy arises between two similar instruments or products, arbitrageurs will seek to profit from the discrepancy. Such discrepancies can arise temporarily in any market— oranges, stocks, lease rates for dry bulk carrier vessels, or sophisticated financial derivatives. As soon as arbitrageurs identify a price discrepancy, they will buy in the cheaper market and sell in the more expensive one. Through their actions, they increase the price in the cheap market and reduce the price in the more expensive market. In due time, prices in the two markets will return to balance. Ultimately, this benefits all other market participants, who know that prices will never diverge significantly from their fair value.

Suppose government regulations were introduced to curtail the activities of arbitrageurs. This would leave market participants with two options:

1. Accept the price in their local market and risk overpaying.
2. Research all other markets to find the "true" value of the product.

In either case, there are costs involved—either the cost of overpaying (or underselling) or the information cost of price discovery. Both outcomes are not optimal and will make markets less efficient.

It is also important to recognize that arbitrage is not a synonym for speculation. Speculators assume market risk in their trades. They will acquire an asset with the hope of reselling it at a higher price in the future. There are two differences between speculation and arbitrage:

1. In speculation, the purchase and acquisition are not made simultaneously, so speculators face prices that can change with the passage of time. They assume full market risk until they sell. Arbitrageurs, however, will execute the purchase and sale simultaneously.
2. Speculators do not know at which price they will be able to sell. There is no guarantee that they will be able to sell at a higher price. Arbitrageurs, however, know exactly at which price they can sell, because the purchase and sale transactions are executed simultaneously.

Similar observations can be made about the difference between arbitrage and price scalping.

In theory, arbitrage is a completely risk-free undertaking. However, most trades referred to as arbitrage in reality involve some risk and should really be referred to as quasi-arbitrage trades. Basis trades in bond futures are one such example. In a basis trade, an arbitrageur buys a bond, sells a bond futures contract, and then delivers the bond upon expiration of the futures contract to the clearinghouse. In reality, the opportunity for a risk-free delivery of a bond into a futures contract, known as a positive net basis in bond parlance, hardly ever exists. Instead, basis traders focus on trading the negative net basis, and they profit as long as they anticipate the cheapest-to-deliver bond correctly. Readers interested in a more detailed description of bond futures basis trades should consult the extensive literature on the topic. Merger arbitrage is another example of such a quasi-arbitrage.

In a strict sense, merger arbitrage is a misnomer because it, too, involves some risk. The type of risk in merger arbitrage is unlike the market risk that financial risk managers are familiar with and build models around: beta risk. Instead, merger arbitrage is about event risk, the event that the merger is not completed. It is not directly related to the movements in the overall market. This does not mean that merger arbitrage is completely independent of the market, especially during large dislocations in the market. However, market movements are not the principal determinant for the successful completion of a merger. It is very difficult to capture event risk mathematically. In most statistical risk models, event risk falls into the unexplained component, the error term. As part of the error term, it is uncorrelated to market risk. It is precisely this property that makes investment strategies based on event risk appealing in the construction of portfolios that seek to reduce exposure to market risk. This topic is discussed in more depth in Chapter 3.

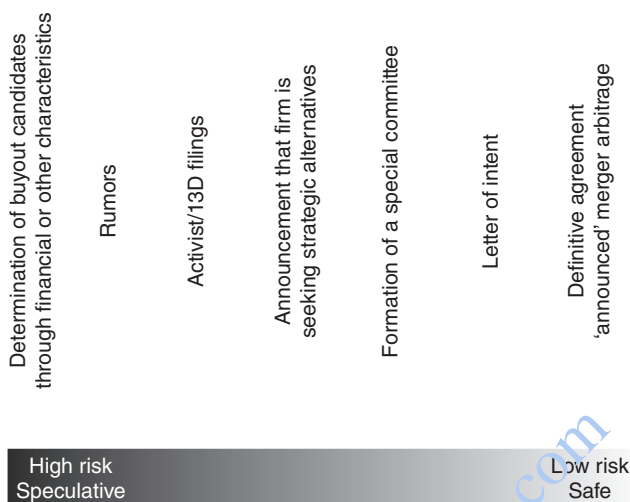
More specifically, the risk in merger arbitrage is primarily the nonconsummation of the announced merger. Much can go wrong between the announcement of a merger and its closing. For example:

- Financing for the transaction can dry up.
- Antitrust authorities can block a transaction.
- The economic environment can change, making the merger less appealing.
- Fraud or other misrepresentations can be discovered.
- A spoiler bidder (a.k.a. white knight) can intervene.

It is the role of the arbitrageur to weigh these risks against the profit opportunity.

Merger arbitrage generally is used to describe a wide range of investment strategies around mergers, many of which have little to do with actual





**FIGURE 1.3** Risk Spectrum of Merger-Related Investments

arbitrage. These investment tactics can be organized into a risk spectrum (see Figure 1.3) from the most speculative activity, which is the most removed from an actual arbitrage, to least risky, which is merger arbitrage in a proper sense.

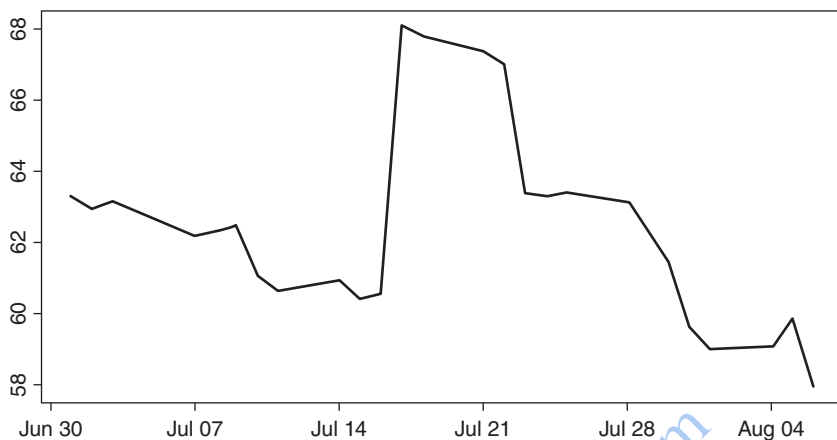
At the most risky end of the spectrum is speculation about potential takeover targets. Some investment magazines occasionally publish lists of takeover targets based on financial characteristics, typically priced relative to cash on balance sheet and earnings before interest, taxes, depreciation, and amortization (EBITDA). The idea is that these companies could potentially be bought out based on attractiveness of their accounts for leveraged buyouts. Of course, there is no guarantee that anybody actually will have an interest in acquiring any of the firms on the list. Many more factors must align before a financial buyer might be interested in acquiring a firm.

Of similar riskiness, albeit occasionally more founded in reality, is the Wall Street rumor mill. There is little doubt that the spreading of such rumors is facilitated by investors who hold the relevant stock. Internet message boards have been a particularly fruitful breeding ground for all sorts of takeover speculation. Sometimes rumors enter analyst reports or newspapers. At that level, rumors are often somewhat more reliable—to the extent that the word *reliable* can be used in describing a rumor. Several publications have made themselves a name with sometimes-accurate reports of ongoing acquisition discussions. The *New York Post* as well as the subscription-based service dealReporter both have writers with excellent contacts in the business

community and are often first in breaking pending merger negotiations. One possible explanation for their journalistic success is more prosaic: They simply may be used to leak ongoing negotiations if one party believes that such a leak can improve its position in the negotiations. In the apparel industry, *Women's Wear Daily* has made itself a name with accurate M&A leaks. For example, in August 2005, it reported accurately that J. Jill was to be sold. A few months later, Jill rejected an acquisition proposal from Liz Claiborne and was eventually sold to Talbots.

The high risk of investing in rumored mergers is illustrated by Bloomberg data. After a rumor about a potential merger starts to circulate, the target company's stock jumps initially by 2.9 percent, based on an analysis of 1,875 rumors between 2005 and 2010. However, investors who short such a stock, thereby seeking to profit from its decline, will generate an average return of 1.2 percent in the subsequent month, or an annualized return of 14 percent.<sup>5</sup> Clearly, buying a rumored takeover company is not a profitable strategy on average. An example of the perils of investing in rumored mergers is the rumored acquisition of Dresser Rand Group by Siemens AG. On July 17, 2014, the German publication *Manager Magazin* reported that industrial group Siemens was interested in acquiring turbine compressor maker Dresser-Rand for \$6.4 billion, and that investment bank Lazard had been retained as financial adviser for this transaction.<sup>6</sup> It was reported that Siemens was even willing to engage in a hostile transaction should that become necessary. The stock spiked to \$68 on the back of this report. However, on July 31, Siemens laid out a strategic plan *Vision 2020* to its investors that relied on organic growth rather than acquisitions for future expansion. The market reaction to these events can be seen in Figure 1.4. An investor acting on the basis of the press rumor would have suffered a loss of roughly 15 percent by the time of the publication of the strategic plan. Nevertheless, the story was true eventually: On September 21, 2014, Siemens announced an \$83 per share acquisition of Dresser-Rand for a total of \$7.6 billion. Most speculative investors who bought the rumor probably sold after the publication of the strategic plan and would no longer have been invested at the time of the announcement of the actual merger.

A more reliable, although still speculative, merger investment strategy is to follow activist investors who try to get a company to sell itself. Activists file their intentions with the Securities and Exchange Commission (SEC) under Schedule 13D. These filings can be a source of potential merger targets; however, companies that are targets of activists are often in less-than-perfect condition and pose significant investment risk. This is, after all, why activist investors target these firms in the first place. Some commercial services monitor 13D filings and provide additional analysis.



**FIGURE 1.4** Stock Price of Dresser-Rand Group around the Rumor of an Acquisition by Siemens

Companies sometimes announce that they are for sale. These announcements are usually phrased as a “search for strategic alternatives, including a sale” or other transaction. Sometimes these announcements come in response to an attack by activist investors; sometimes a company’s board decides on its own to explore the possibility of a sale. Compared to the previously discussed scenarios, investing in a firm whose management is actively pursuing a sale is much safer, but it still is no arbitrage because the company may well be sold for less than it can be purchased for at the time of the announcement. In addition, the outcome of such an investment depends highly on the market environment. In a bull market, it is relatively easy for management to sell the firm at a premium. In contrast, in a bear market, no buyers may materialize and the stock may fall along with the market.

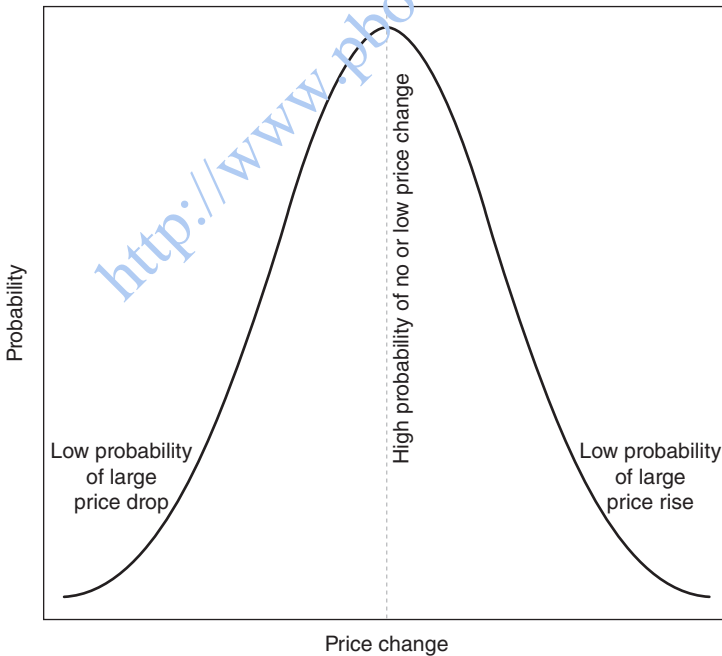
Potential acquirers sometimes enter into a letter of intent before signing a formal merger agreement. Investing after a letter of intent can be very speculative. Most merger partners enter into a definitive agreement right away. Letters of intent are a sign of adverse selection: Either the buyer or the company is not yet quite ready to sign a definitive agreement. In the case of the acquisition of CCA Industries by Dubilier & Co., a private equity firm managed by the son of a cofounder of Clayton, Dubilier & Rice, a letter of intent led to a busted buyout because the acquiring private equity fund could not arrange the requisite financing. Had the firm found it easy to arrange the financing, it would have entered into a definitive agreement rather than a letter of intent in the first place.

Hostile bids are of a similar degree of risk as letters of intent. If the target fends off the bidder successfully, its share price may well revert to a lower, prebid level. Even worse, if an arbitrageur has set up a short position in the acquirer (see Chapter 2), a short squeeze could ensue, leading to losses on both the long and short side of the arbitrage.

The only real merger arbitrage occurs when the arbitrageur enters the position after a definitive agreement has been signed between the target and the acquirer. Arbitrageurs who specialize only in this type of transactions refer to it as announced merger arbitrage to differentiate it clearly from the other, more risky investment styles shown in the risk spectrum in Figure 1.3.

The remainder of the book addresses transactions in which a definitive agreement has been reached.

Merger arbitrage resembles in many respects the management of credit risk. Both are concerned with the management of a large asymmetry in pay-offs between successful transactions and those that incur losses. A typical stock investor is faced with an almost symmetric payoff distribution (see Figure 1.5). The stock price is almost as likely to go up as it is to go down. The likelihood of a small gain is roughly the same as the likelihood of a loss of equal size. Larger changes in value are also almost equally likely. The downside is

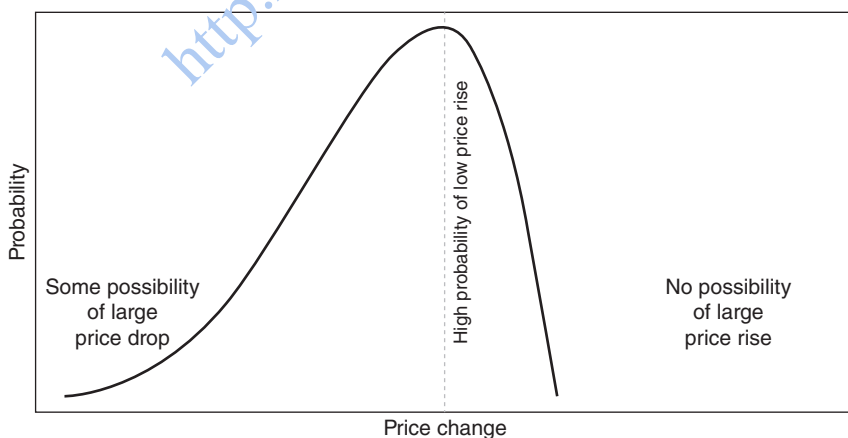


**FIGURE 1.5** Payoff Distribution for Stock Investors

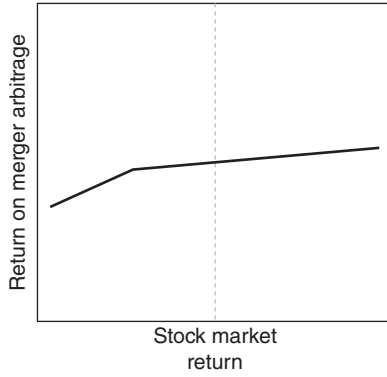
unlimited, or limited only by a complete loss of the investment. The upside, however, is unlimited. Every now and then, an investor gets lucky and owns the next Microsoft or Berkshire Hathaway. A small upward drift in stock prices means that in the long run, stocks trend up.

The situation is different for merger arbitrage and credit managers (see Figure 1.6). The upside in a merger is limited to the payment received when the merger closes. Likewise, the most credit managers will receive on a loan or bond is the interest (or the credit spread if they manage a hedged or leveraged portfolio). The downside is unlimited: If a merger collapses or a loan goes into default, a complete loss of capital is possible in a worst-case scenario. The only reason why investors are willing to take risks with such an asymmetric payoff distribution is because the probability of a large loss is very small and the probability of a small gain is very large. The skill in merger arbitrage, as in credit management, is to eliminate investments that have a high probability of generating losses.

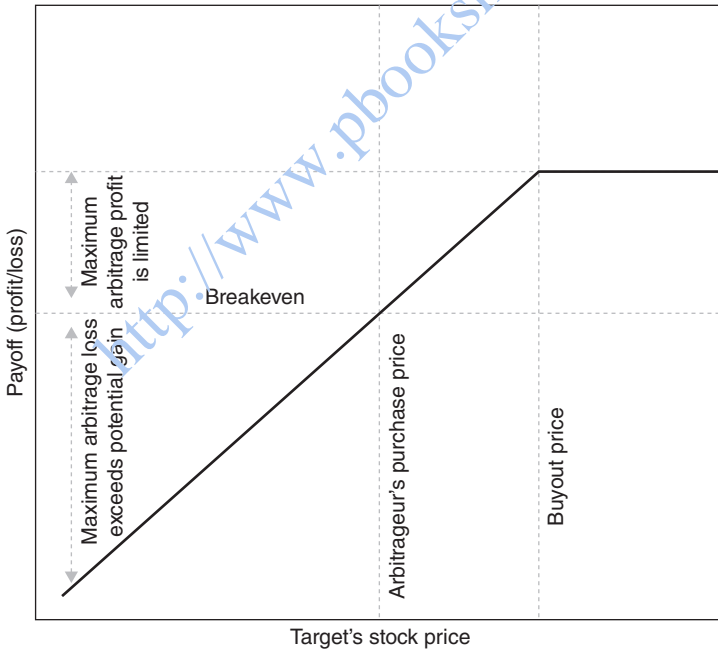
Another field in finance has payoff distributions very similar to those of merger arbitrage and credit: option selling. An option seller expects to make only a small return in the form of the option premium but can suffer a significant loss when the option is in the money. Option strategies are often depicted in payoff diagrams, such as that of a short (written) put option in Figure 1.7. In 1873, Henri Lefèvre, the personal secretary of James de Rothschild, pioneered the use of these diagrams for option payoffs. If at expiration the stock price rises above the strike price, the option seller will earn only the premium. However, if the stock price falls below the strike price, the option seller will suffer a significant loss. Merger arbitrage and credit resemble this payoff pattern. Figure 1.8 shows the payoff diagram for



**FIGURE 1.6** Asymmetric Payoff Distribution



**FIGURE 1.7** Lefèvre Diagram of the Put Option Characteristics of Merger Arbitrage



**FIGURE 1.8** Lefèvre Payoff Diagram of Cash Mergers

a simple merger arbitrage, where a buyer proposes to acquire a company for cash consideration. If the transaction passes, the arbitrageur will receive only the spread between the price at which she acquired the target's stock and the price at which the firm is merged. However, if the merger collapses, the stock price probably will drop, and the arbitrageur will incur a loss that is much larger than the potential gain if the merger is closed.

From an arbitrageur's point of view, the most important characteristic of a merger is the form of payment received. Therefore, in merger typology arbitrageurs use payment method as the principal classifier. Other merger professionals, such as tax advisers or lawyers, often use other criteria to categorize mergers. For example, tax advisers distinguish between taxable and tax-exempt mergers, whereas legal counsel may distinguish mergers by its antitrust effect. There are three principal categories of mergers and one rare category:

1. *Cash mergers.* The shareholders of the target firm receive a cash consideration for their shares.
2. *Stock-for-stock mergers.* The shares of the target firm are exchanged for shares in the acquirer.
3. *Mixed stock and cash mergers.* The target company's shareholders receive a mix of cash and a share exchange.
4. *Other consideration.* In rare instances, shareholders of the target firm receive debt securities, spun-off divisions of the target, or contingent value rights. The next chapter will show how each of these types of mergers can be arbitrated.