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Corporate managers have an intuitive sense that an effective risk management program contributes to shareholder value, but they typically find it difficult to measure or communicate the success of such a program. Much of the difficulty stems from confusion about the proper goals of risk management—and how such goals relate to profitability—and about the role of derivatives in the execution of a risk management strategy.

At the heart of the confusion is a paradox: risk management necessarily involves costs—costs that often end up reducing a company’s reported earnings and cash flows. Yet if done in a way that increases the stability of such earnings and cash flows, an effective risk management program is likely to increase the value of the firm. The main source of the confusion is that while the costs of risk management are usually explicit and readily identified, the benefits are less obvious and difficult to quantify. For that reason, assessing the performance of a corporate risk management program—estimating risk management’s value added, if you will—is fraught with problems. One all-too-common problem is the mistaken tendency of outsiders—and even corporate boards—to identify derivatives losses on well-designed hedges as a risk management failure. In a typical situation, a company hedges because it cannot predict whether the exposure hedged will make a gain or a loss and it wants to avoid this uncertainty—and for most kinds of hedges, this means that the hedge is fully expected to show losses when the exposure hedged turns out favorably for the firm.

Consider the common situation in which an enterprise insures its physical premises against fire and other natural disasters by paying insurance premiums to a property and casualty firm. In most cases, the enterprise pays premiums for many years without receiving any cash back from the insurer. Most observers would agree that such a practice should not be viewed as an “unprofitable” investment, or as a failure of risk management. By the same token, a company whose buildings are destroyed in a fire and later receives a large sum from its insurer would not be considered as having a successful, or “profitable,” risk management strategy simply because the cash it received from its insurer exceeded what it paid.

As this example is meant to show, then, most people recognize that the case for buying fire insurance has nothing to do with whether a fire actually occurs. That is, the eventual outcome of a fire—and a payout—is not the test of risk management success or failure. The real question is whether the costs a company is expected to incur as a result of a fire are worth the payment of the premiums.

Managers at many public companies—particularly smaller companies—insure their physical premises not because their shareholders need or value such protection, but usually because of the possibility that their destruction could disrupt the firm’s operations and even undermine its ability to carry out its business plan. The loss of shareholder value in such cases would include not just the value of the physical assets destroyed but, more important, the present value of any future business investments or opportunities that were passed up because of financial distress or constraints resulting from the uninsured losses. In this way of thinking, even a small chance of an enterprise-threatening economic loss can warrant spending money for insurance.

Unfortunately, however, managers generally find it much more difficult to apply the intuition that commonly arises in the case of fire insurance to more complex business risks, especially financial risks. Before describing some of these difficulties and how to deal with them, I start by offering a list of basic principles that can be used to guide the formulation and execution of an effective, value-conscious risk management strategy.

First Principles of Value-Adding Risk Management

• Most companies have a finite capacity to bear risk. When they are close to this capacity, bearing one risk comes at the expense of bearing another risk. For instance, if a company chooses to bear exchange rate risk that it could easily lay off in the derivatives market, retaining that risk could come at the expense of taking on the risk of a new factory or a

1. See David Mayers and Clifford Smith, “On the Corporate Demand for Insurance,” Midland Corporate Finance Journal, Vol. 1 No. 3 (Summer 1983). For individuals intent on protecting their homes, the purchase of fire insurance is generally a “no-brainer.” The expected consequences of enduring a fire without insurance—in many cases, destruction of a family’s most valuable asset and the possibility of financial ruin—ensure that most people almost invariably find it worthwhile (if their lenders don’t insist on it) to pay premiums that reflect the pooling of very large numbers of homeowners. But as discussed throughout this article, for public companies with well-diversified shareholders, the motives for corporate purchases of insurance are somewhat different because of differences in expected costs.
new research project. Hedging can create value by enabling companies to shed non-productive risks and so clear the way to take on productive risks.

- Most companies have a comparative advantage in bearing and managing some risks but not others. This principle of comparative advantage in risk-bearing implies that companies should retain and focus on managing those risks where they have a comparative edge, while seeking to transfer other risks to investors or other companies more able or willing to bear them.

- Because the costs of effective risk management are typically explicit and out of pocket, while the benefits are at best only partly captured by earnings, evaluating risk management based on its impact on short-term earnings misses the point of having a risk management function in the first place. Proper evaluation of risk management is a strategic, forward-looking activity—one that aims to compare the long-run expected value of the firm when hedging its critical exposures to the value of the firm without such hedges.

- The value created by hedges should never be evaluated on a stand-alone basis. A hedge creates value by laying off risks that have the potential to do serious damage to the firm's operations and strategy, and that value can be assessed only in terms of the gains to shareholders from laying off that risk. Whether a hedge makes money or loses money is irrelevant in assessing whether it was a good or bad hedge.

- Risk management is a substitute for equity capital. At the margin, it may be cheaper for companies to pay to lay off risks than to issue more equity. By hedging some risks, companies can reduce their overall level of risk and thereby limit the possibility that their operations or strategies will be disrupted by adverse shocks. Alternatively, they can use hedging to maintain their overall level of risk by either funding their existing operations with more debt, or by using their expanded risk-bearing capacity to take on valuable but risky new projects and activities in which they have a comparative advantage.

- Companies that are exposed to enterprise-threatening (even if very low probability) risks—think, for example, of banks and other financial institutions—could theoretically raise so much additional equity capital that they would be virtually assured of survival even in a worst-case situation. But such companies would then have the burden of trying to generate adequate rates of return on all that additional equity in order to avoid destroying value.

- The purpose of risk management should not be simply to eliminate, or minimize, the volatility of the firm's earnings or cash flow. The smoothing of earnings or cash flow through risk management instruments creates no value in and of itself because shareholders have the ability to diversify risks through portfolios of investments. (Indeed, to the extent that risk management is costly, or causes management to make shortsighted operating or investment decisions, such smoothing activities could actually destroy value over time.)

- Rather, the purpose of risk management is to avoid potentially crippling consequences to the enterprise from risks that are beyond management's control or influence. Such risks may include fluctuations in commodity prices, interest rates, and foreign exchange rates, as well as counterparty credit risks and natural disasters.

- Finally, a risk management strategy cannot succeed without effective communication. The people who design and implement a risk management strategy must ensure that their CEO and board understand the possible outcomes of the strategy, and how the strategy increases (expected) value. Further, management should attempt to communicate the principles underlying its risk management program and the value created by its hedging strategy to the investment community. Failure to convince the market of the benefits of its hedging programs—and to explain why these benefits have nothing to do with the profitability of the hedging instruments themselves—can only reduce the effectiveness of these programs.

Although these principles are widely accepted by financial economists, practitioners have often found practical implementation to be very challenging. The recent past has provided a dramatic reminder that efforts to reduce risk through hedging is itself fraught with challenges and uncertainty, even for institutions with financially sophisticated staffs such as banks. Hedges have failed to achieve the objectives they were designed for. Following the basic principles listed above (and discussed in more detail below) should make hedging mishaps less likely, while making it much more likely that risk management is used to increase shareholder wealth.

An Expensive “Costless” Hedge

A striking example of the problems that can arise from what appears to have been a misguided focus on hedging costs is presented in Michael Lewis’s best-selling book The Big Short.2 The book portrays a “hedge” against subprime risk that ended up producing a loss of $9 billion for Morgan Stanley. Unfortunately, the hedge produced such damaging losses during a period when the performance of subprime mortgages turned out to be much worse than expected—and when most observers would have expected the hedge to provide the bank with large infusions of cash to cushion the losses on its mortgage portfolios.

How did this happen? In 2007, according to Lewis’s account, Morgan Stanley constructed a large hedge against its subprime mortgage securities holdings that involved buying,

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first of all, a form of insurance called “credit default swaps” on the riskiest tranches of the mortgage-backed securities issued in mortgage securitizations. In the event of an unexpectedly large increase in mortgage defaults and a sharp reduction in the value of these securities, the payoffs from the insurance on these risky securities were expected to offset (or at least limit) the effect of the mortgage losses.

But buying insurance, as we have seen, is costly; premiums have to be paid. And according to Lewis, officers at Morgan Stanley apparently wanted the hedge to be “costless.” In other words, they did not want the insurance premiums of the hedge to reduce reported profits.3

The attitude of the officers at Morgan Stanley was in no way unusual. Managers everywhere have a preference for hedges that have no impact on reported profits. The typical approach to making a hedge “costless” is to buy protection for the downside by giving up the gain from the upside. For instance, a company that has a foreign currency receivable it wants to hedge can simultaneously buy puts and sell calls on that currency, with the idea that the premiums earned on the calls will offset the premiums paid on the puts. In an attempt to create a “costless hedge,” the trader at Morgan Stanley decided to sell protection on the safest securities backed by subprime mortgages—that is, mortgage-backed securities that not only had the highest rating (AAA) from the rating agencies, but were also widely regarded by investment professionals as the safest among those with the highest AAA rating.4 Selling this kind of protection on the highest-rated (and presumably safest) tranches enabled Morgan Stanley to earn premiums it could use to buy protection on the lowest-rated (and presumably riskiest) tranches. The problem with this hedge, however, stems from the fact that it was not a typical costless hedge in which the firm gives up the upside to pay for protection on the downside. Such a hedge would have involved selling calls on the value of subprime bonds—in which case, if the bonds appreciated in value, Morgan Stanley would have had to make payments and hence give up some of the profits on its subprime exposure. Instead, the trader chose to receive payments from taking on an additional exposure to subprime; and when the defaults ended up exceeding levels considered highly unlikely by even sophisticated analysts and their financial models, the combined losses on that additional exposure and Morgan Stanley’s portfolio of mortgages swamped the inflows from the risk-reducing part of its “hedge” portfolio.

The apparent rationale for this hedge was the belief that the problems caused by defaults on subprime mortgages would never be bad enough to do serious damage to the highly rated securities. But the reality is that, by selling protection on the AAA tranches, the trader took on risk to those tranches to earn premiums; in other words, he made a bet to pay for a hedge.5

To sum up, the story of the Morgan Stanley hedge that failed is actually not a story of a hedge that failed. It is rather the story of a hedge that effectively incorporated a bet—and the effect of that bet was to undo the hedge.

How Hedging Adds Value: A Simple Example

Consider a U.S. corporation, Exposure Inc., which has just agreed to deliver product X to a German firm in two years for 1 billion Euros. Exposure Inc. could “lock in” today the two-year forward exchange rate of $1.32/Euro. Given that Exposure is confident that its costs of producing X will be $1.2 billion, revenue of $1.32 billion would give it an operating profit of $120 million and thus a 10% profit margin. But it’s important to recognize that because of uncertainty about the future value of the Euro/dollar exchange rate, the anticipated $120 million profit is only an expected profit. That is, it is the average of the range of possible expected exchange rate outcomes, one that assumes that the exchange rate two years from now will be unchanged from where it could be locked in today with a hedge. Although the exchange rate at the end of two years could turn out to be the same as today’s forward rate, it is much more likely that the actual exchange rate will be either higher or lower than $1.32/Euro. The FX rate thus represents a risk in that it introduces a random element to the outcome; it is not something that the management of Exposure can predict or influence.

Now let’s suppose further that management believes there is a 50% chance of the exchange rate two years hence

3. It is, of course, impossible based on the discussion in the book alone to know all the constraints faced by the Morgan Stanley executives faced in making their decisions.
4. More specifically, Morgan Stanley bought credit default swaps (similar to puts) on the riskiest mortgage-backed securities in its portfolio and then sold credit default swaps on its apparently more credit-worthy mortgage-backed securities to pay for the CDS purchased.
5. Morgan Stanley could have avoided such a bet by employing a zero net premium hedge. These are also commonly known as “zero cost collars” or “costless” hedges. Of course, no hedge is costless as derivatives dealers do not work for free. But a zero net premium hedge is structured so that the owner of the risky asset (e.g. Morgan Stanley) receives a put option on the asset but grants a call option on the same to the other party. Strike prices are set so that neither the hedger nor the derivatives dealer pays the other a premium at the outset of the trade.

Why didn’t Morgan Stanley buy puts and sell calls on its subprime securities for no net premium? One reason must be that there was no active market for puts and calls on those subprime securities. There was, however, an active market for credit default swaps—i.e., insurance contracts—on indices for subprime securities and some individual subprime securities. Credit Default Swaps (CDS) are a lot like put options on subprime securities, except that they protect against default losses rather than market value losses. Unfortunately, though, there were no CDS equivalents of call options on the same underlying instrument for Morgan Stanley to sell. In theory, they could have approximated the benefits of a zero net premium hedge by selling calls on other assets whose returns were correlated with housing prices such as homebuilding stocks, but they did not try that.

What Morgan Stanley chose to do was to sell CDS on securities (i.e. insure the value of securities held by other parties) with higher credit ratings in order to get the cash to buy the CDS it bought to protect its own risky subprime securities. In Morgan Stanley’s case, the hedge worked to the extent that Morgan Stanley received payments from the CDS it owned when the lower-rated subprime securities lost value. Unfortunately, Morgan Stanley lost even more money on the CDS it had sold to fund the purchase of the CDS it has bought. The subprime crisis was so severe, that even the less risky securities lost a great deal of value. With calls instead of CDS on the highly-rated bonds, Morgan Stanley would have had to pay if the bonds appreciated in value so that their value exceeded the exercise price, but it would have had to pay nothing if the bonds fell in value below the exercise price.
being either $1.00/Euro or $1.64/Euro. If the Euro drops to $1.00, the firm’s revenues will be worth only $1 billion and Exposure would have suffered a loss of $200 million or earned $320 million less than it expected. If the Euro increases to $1.64, Exposure would have a profit of $420 million or earned $320 million more than it expected.

Without a hedge, then, the firm’s profits will be pushed either up or down by $320 million. Exposure could effectively ensure that it will realize its $120 million profit by hedging the foreign exchange rate—and, not surprisingly, many companies do choose to hedge such exposures. But there are some, though usually modest, costs associated with FX hedging, such as dealer bid/ask spreads.

Should the company hedge its currency exposure? If Exposure were a very large international enterprise with an enormous equity base, a reasonable case could be made that management should avoid hedging as long as the following conditions are met:

- Its shareholders are globally diversified—and may even be holding proportionate shares of both Exposure Inc. and its German customer and
- A foreign exchange loss of $200 million could not possibly create a degree of financial distress that would affect its operations or interfere with its ability to carry out its strategic plan.

On the other hand, Exposure would have very strong reasons to hedge if:

- It is a closely held firm whose owners have a substantial fraction of their wealth in the firm’s equity.
- A $200 million loss would put it into a difficult financial situation, cause it to cancel planned investments, or force it to issue more equity.

Know Why You Hedge!

Managers must have a clear understanding of why the hedge is put on. In the case of Exposure Inc., this means understanding the consequences of the loss if the company earns less than expected on its contract.

In the language of economists, the question is whether the loss would have “deadweight costs”—that is, longer-run negative effects on firm profitability and value that the company would experience as a consequence of its exchange rate losses. The most important source of such deadweight costs are what economists call “financial distress costs.” When a company experiences unexpectedly large losses, even if it does not actually enter bankruptcy, its ability to function normally—to conduct its operations efficiently, and to invest in all its positive-NPV projects—can be seriously impaired. The reduction in value resulting from any shortsighted cutbacks in operations or foregone investment opportunities should be viewed as financial distress costs—and, indeed, the main reason to hedge exposures.

Take the case of a company that, given its currency risk and capital structure, is already operating at the limit of its risk-bearing capacity. In this case, if the company were presented with a valuable new opportunity it was determined to invest in—say, expansion into another overseas market—management would have two choices: either hedge its Euro/dollar exposure to keep its overall risk at acceptable levels, or increase its ability to bear risk by raising more equity. If the company chooses to hedge without raising equity (and thereby reducing leverage), the decision to hedge must be justified by the reduction in the present value of future distress costs—or, in what amounts to the same thing, the expected amount of franchise value preserved. And that calculation should include the value of promising new investments that hedging effectively makes possible.

Let’s try to illustrate this calculation of deadweight, or distress, costs by continuing with our example. And let’s begin by assuming that the company experiences a $200 million exchange rate loss a year from now—and that, over the next ten years, that loss has no material effect on the value of the company’s operations or strategic investments. In that case, Exposure’s shareholders would have suffered a presumably one-time, or “non-recurring,” loss of $200 million. (And because the loss is non-recurring, investors are unlikely to capitalize the value of that loss when assessing the company’s long-run profitability and value.) In such a case, if the firm’s shareholders hold globally diversified portfolios, they would have no reason to want the company to hedge that risk; in fact, they might even prefer that the company not hedge its currency exposure, since such hedging would duplicate at a cost the effects of the diversification achieved through their own portfolios. But now let’s change some of these assumptions. This time we will assume that such a foreign exchange loss would be disruptive enough to force Exposure Inc. to raise $200 million in new equity. And let’s also assume that, in the process of issuing new equity, the company incurs “transactions costs” of $20 million—mainly, the “information costs” associated with issuing undervalued equity under duress. In that case, hedging would be seen as creating $10 million (0.5 x $20 million) of shareholder wealth since it would eliminate the risk that the company would incur the costs of raising equity. To the extent that the firm’s hedging transaction costs are less than $10 million, the firm is expected to increase shareholder wealth by hedging. And given that the expected cost of putting on a straight-forward foreign exchange hedge would be about one basis point, or $132,000, such a transaction would be creating value for shareholders.

The main point of this exercise, then, is that companies should always try to determine whether their shareholders are better off as a result of a hedge on an ex ante, or before-the-fact, basis. That is to say, the benefits of the hedge should be clear when the firm enters the hedge—and thus not depend in any way on future price movements, or the profitability of the hedge itself. Adhering to this discipline requires the firm to identify where the benefit of the hedge is coming from—and,
when possible, to make some attempt to quantify the benefits.

But rather than trying to estimate deadweight costs every time it hedges, a company should know the level of risk that it is seeking to reach and maintain—or what is often called its “risk appetite.” Put another way, management has to decide how much risk the company can bear without jeopardizing its ability to achieve its goals.² If the company can carry a lot more risk without affecting its ability to carry out its business plan and invest in its future, hedging is unlikely to create value. But when companies reach the point where an adverse development can quickly put it in a situation where, say, their creditors and suppliers begin to get nervous, hedging can create a lot of value.

In sum, a company’s risk appetite will be a critical—and likely the most important—determinant of its hedging policy. But having stated that, some risks may just be too difficult or too expensive to hedge. In that case, the corporation has two main choices: either change the firm’s investment policy and avoid taking such risks; or stick with the strategy, and change the firm’s financing policy by raising the additional equity that will enable it to withstand losses from random events.

What Does It Mean for a Hedge to “Fail”? Let’s revisit Exposure’s decision to hedge. Suppose it sold forward $1 billion Euros. If the Euro trades at $1.64 two years later, Exposure would still have the expected operating profit of $120 million. But, as is likely to be reported in business press headlines, profit would be $320 million less than if it had not hedged.

Did Exposure Inc. make a mistake? Did the hedge fail? The company had no better ability to forecast the exchange rate than the market. And because the costs associated with one of the (two) possible FX outcomes were significant, it did the right thing when it made its decision based on the information it had. At the time of the decision, the entire transaction was a positive-NPV project. The company rightly chose to take the project and achieved its expected profit. Since the foreign exchange rate had a 50/50 chance of going either up or down, the gain or loss on the hedge was a random event—but management was confident about the project’s profitability (after excluding the effects of a currency change). The fact that the hedge instrument made a loss for Exposure is just the consequence of the fact that the Euro revenue of Exposure turned out to be worth more than expected. The company did the right thing ex ante, and that’s what matters.

But what if the company believes that it has an advantage or edge in forecasting FX rates or other financial variables? Even if a firm believed that it could turn foreign exchange trades into something resembling a 55/45 or 60/40 advantage, it could make sense to hedge some of its foreign exchange risk. In that case, it would simply hedge less if it expected the Euro to appreciate than it would if it assumed that rate changes were like the outcomes of a coin toss. However, in that case, the bet contained in the hedge should be evaluated in the same way as any other bet. If the firm thinks it can beat the foreign exchange market, it should use that skill to benefit its shareholders—but it should evaluate its record as one evaluates the record of any investment manager.

Hedging transactions give rise to some new, though typically much smaller, risks for the hedger. In the case of Exposure Inc., the hedge can fail only if the bank fails to deliver dollars against Euros. This risk is called “counterparty risk”—and as the failure of Lehman Brothers in 2009 demonstrated, counterparty risk can have major consequences. Hedgers must evaluate the risk of potential counterparties and put in place mechanisms that would protect the firm if its counterparty risk were to increase. These might include requiring the counterparty to post collateral if its rating deteriorates, or buying credit default swaps on the counterparty.

Hedges also often involve basis risk, which is the risk that the hedging instrument does not offset exactly the risk the firm is trying to hedge. $US/Euro risk is easily hedged and may even allow Exposure to be perfectly hedged. In many cases, however, a perfect hedge is not available. For example, some airlines hedge their jet fuel price risk with crude oil futures because hedges on jet fuel are not practical. Crude oil-based derivatives have been used to hedge a number of refined petroleum products because their prices track the others pretty closely. However, there is always the risk that crude-oil prices will diverge materially from prices of refined petroleum, in which case the performance of the hedge will be adversely affected. For some other risks, the basis risk may be so great that the firm is better off not hedging.

Companies must trade off the basis risk against the deadweight costs associated with adverse outcomes. As with general market risks, a hedge cannot and should not be evaluated based on its outcome, but rather on the ex ante considerations that led to the hedge. In the example with basis risk, a divergence between crude oil and refined product prices could make a hedge using crude oil to hedge refined products perform poorly—but this would not mean that the hedging strategy was flawed as long as management was aware of the basis risk and made a convincing case that bearing such basis risk was better than not hedging at all.

How to Think about Hedging Costs
Hedging instruments are often more complicated and expensive than forward exchange contracts, where
transaction costs may be one basis point or less. For instance, the Morgan Stanley hedge discussed earlier involved the use of credit default swaps. Credit default swaps are insurance contracts for credit risk that require periodic payments that are analogous to the periodic payments required by insurance policies. The insurance pays off if there is a default by paying the amount lost due to default. Other kinds of hedges, such as those involving the purchase of puts, require the payment of one-time, upfront premiums.

Consider the economic balance sheet of a firm, Financier Inc., whose sole asset is a portfolio of loans that is worth $1 billion today. It has borrowed $900 million to finance the loan portfolio, so that if the value of the portfolio falls by $100 million, Financier Inc. is insolvent.

Suppose further that bankruptcy would impose additional costs of financial distress of $20 million (in present value terms). In other words, in the event of default or bankruptcy, the value of Financier’s loan portfolio (after, say, a forced liquidation) is expected to lose an additional $20 million. Another way to put this is that the going concern value of the firm is $100 million, but $20 million of that value is expected to evaporate if the firm files for bankruptcy, perhaps because the loans have to be liquidated in a fire sale. And let’s assume that bankruptcy occurs if a certain percentage of the loans default and, to bring the question of hedging costs into clearer focus, that the estimated probability of bankruptcy—without any hedging at all—is 50%.

The firm could buy a credit default swap on its loan portfolio to protect itself against default by the loans it holds. Such a swap would be a “bespoke” contract, and thus be priced by the dealer who provides it so as to cover its production costs. And let’s suppose the terms of the swap would require Financier to pay its counterparty $2 million quarterly. Of that $2 million, let’s further assume that $1.8 million is the so-called fair value premium—that is, the premium such that the swap would have zero value at origination—while the remaining $200,000 per quarter represents dealer profits and implementation costs.

How should Financier Inc. think about this cost? How should it affect its hedging decision?

By entering into the credit default swap, Financier Inc. effectively acquires an asset that is worth the present value of the payment that would be received by Financier in the event of default on its portfolio. And let’s assume that this present value is $20 million. In return for such protection, the firm is obligated to make a series of payments that represents a liability with a present value of $22 million, which is the present value of the quarterly payments. That $22 million can in turn be decomposed into a present value of protection payments of $20 million plus $2 million that represents the value of the compensation to the dealer.

If we make these assumptions, along with an initial assumption that Financier Inc. has no “deadweight” costs—that is, no value is lost if the firm experiences financial distress—the present value of the costs of the swap appears to exceed the present value of the benefits by $2 million. And in such a case, we would conclude that shareholder wealth would be reduced by hedging.

But now let’s go back to our original assumption that Financier Inc. has deadweight costs of default with an expected value of $10 million ($20 million expected loss when liquidating the loans times a 50% probability of bankruptcy). By entering the hedge, Financier Inc. increases shareholder wealth by $8 million, and so hedging is beneficial.

One important lesson from this example is that most of the quarterly premium of $2 million should not be viewed as a payment that reduces shareholder wealth. When the firm enters the credit default swap, the shareholders incur a liability but receive an asset of close to equal value. And on top of the intrinsic value of the asset ($20 million), the firm also receives the value of the protection against financial distress—estimated at $10 million—provided by the CDS.

So, how should the company think about the cost of the hedge? The cost has three components. First, the company receives an asset in exchange for the promise to pay the $2 million quarterly premium. That asset when considered alone—and apart from any value as a hedge—has a present value of $20 million. But the present value of the premiums is $22 million. Consequently, as the firm enters into the hedge, $2 million walks out of the door. Second, the firm has an expected benefit from employing the CDS as a hedge that we estimated at $10 million—a gain that, after netting out the transactions costs of $2 million, leaves a net benefit of $8 million.

But there is also a third cost that, for some companies, could be large. The firm faces a cash outlay of $2 million quarterly—and this cash presumably has an opportunity cost. Perhaps most important, entering the CDS contract could conceivably prevent the firm from taking advantage of other valuable opportunities—or making necessary investments or just complying with its debt covenants. Although such opportunity costs are unlikely to be material for most companies, for firms that face severe financial constraints the costs could be substantial.

Funding the Hedge

In the previous section, the value of the hedge to shareholders depended partly on the opportunity cost of having to pay $2 million. As we saw, evaluating that cost is tricky. By paying $2 million quarterly, the firm receives an asset of almost equivalent value in present value.

To simplify the discussion, let’s go a step further and assume that the CDS is a zero-NPV investment in the sense that the present value of the premiums is the fair value of the promised payments to be received in the event of default. In this case, the only component of the cost of the hedge that
affects shareholder equity is the opportunity cost to the firm of the $2 million quarterly premium. If the firm expects to earn a risk-adjusted rate that is equal to the risk-free rate on the cash, there is no opportunity cost. In that case, the hedge is all gain for the firm’s shareholders.

For many companies, however, paying a $2 million premium will have some opportunity cost. Even if the cash sits in a bank account, access to that cash has value since it enables the firm to deal with the unexpected. Further, the firm might not even have the cash on hand. In that case, should it borrow or sell assets to fund the hedge? No matter which of these alternatives it chooses, it would incur costs that should be accounted for when evaluating its hedging decision.

In the case of Financier Inc., the firm might be forced to sell loans in an illiquid market. If the transactions costs involved in selling the loans are small—that is, lower than the deadweight costs reduced through the hedge—it could make sense to liquidate the bonds and pay for a hedge. But if the present value of the selling costs were higher than the present value of the deadweight costs saved, the firm is better off not hedging.

In sum, the cash costs of the hedge can become important if the firm does not have the cash, or use of the cash has a large opportunity cost. In that case, the firm must compare any additional costs on top of the cash payments to the dealer against the reduction in deadweight costs provided by hedging.

The discussion of hedging costs up to this point has ignored an important feature of many derivatives—namely, that they are marked to market frequently, often daily, and that derivatives losses might have to be paid even though the gain on the position hedged are not yet realized. Recent regulatory changes in derivatives markets imply that such mark-to-market payments—or “variation margin payments” as they are called—are much more likely than before. Before the financial crisis, many corporate users of over-the-counter derivatives did not have to pay variation margin. Now such users are likely to have to pay variation margin and to post initial margin—that is, to make a payment initially that protects the dealer against counterparty risk.

Funding the initial margin increases the opportunity cost of putting on a hedge and the opportunity cost of the initial margin payment has to be taken into account when choosing to hedge. Further, variation margin payments can be a drain on a firm’s cash while the hedge is maintained and can even force it to raise expensive financing to make margin payments. In the past, corporate end-users could maintain hedges without having to post initial or variation margin when their hedge was over-the-counter with a relationship bank. The Dodd-Frank Act has made hedging more complicated for firms as it requires end-users to post initial and variation margin for many types of over-the-counter derivatives—though some contracts, including physically settled foreign exchange forwards (like the contract used by Exposure Inc.) and swaps are exempted for commercial end-users.

Difficulties with funding variation margin payments can even create financial distress. Such variation margin payments have long been required for futures contracts. One company, Metallgesellschaft AG (hereafter “MG”), decided that it could create a profitable business by entering long-term contracts to sell oil to manufacturing firms at fixed prices. When it entered these contracts, it effectively assumed a short position in oil prices, such that if oil prices increased, it would make a loss on these contracts. To hedge that exposure, it entered various financial contracts, including exchange-traded futures contracts. With the futures contracts, it bought oil for future delivery at a fixed price. Consequently, if the oil price increased, it lost money on the contracts with its customers but in principle offset the loss through the futures contracts.

The problem with that strategy was that, as oil prices fell, MG had to make margin payments on the futures contracts. The amounts disclosed in December 1993 exceeded a billion dollars and put the firm in a difficult financial situation, forcing it to sell corporate assets. Although the company was making gains on the long-term contracts that were offsetting the futures losses, the gains would be realized only later and not when it needed the cash for the futures contracts. The company was eventually forced by its creditors to unwind the hedge and sell off its assets. The lesson from the Metallgesellschaft experience is that a hedging strategy must have a sound plan for funding the hedge if payments are going to be required during the life of the strategy. In the case of MG, the cash paid on its futures turned out to have a very high opportunity cost.

When to Use Portfolio Hedges?

Some firms, especially financial ones, hedge portfolios with derivatives based on indices of different instruments because trying to hedge each holding would be impractical or prohibitively expensive. For example, there are derivatives on indices of different debt instruments. The best-known of such derivatives are credit default swaps on the CDX indices, which are issued every six months. Each index is an equal-weighted portfolio of credit default swaps on 125 investment-grade names.

By buying protection on a CDX index, Financier Inc. would not have a perfect hedge because the debtors for the loans in its portfolio are likely to be somewhat different from the names in the CDX. Nevertheless, because losses on a diversified portfolio of investment grade credits are likely to be highly correlated with losses on the CDX, use of the CDX should give Financier a reasonably effective hedge, albeit with some basis risk, provided its loans are to investment-grade credits. The benefit to Financier from using the CDX is that there is an active market for the CDX indices. As a result, instead of paying a present value of transactions costs of $2 million to the dealer as in the previous section, the present value of transactions costs might be as little as $100,000.
Accounting is not the Hedger’s Friend.
Roughly speaking, accounting has two methods to value balance sheet assets and liabilities. The first approach is to record the value of an asset at historical cost and then, over time, reduce that value for any amortization or depreciation. The second approach is to record the value of an asset at “fair value.” Fair value is an estimate of what the asset could be sold for under normal circumstances.

When an asset is reported at its amortized cost, its value on the balance sheet is unaffected by changes in the market. For instance, if a bond is recorded at amortized cost, its value would be its amortized cost even if the bond’s market value has fallen by 30% since it was acquired. In contrast, with fair value accounting the value of the bond on the balance sheet would have fallen by 30% or so since the bond was acquired. If an asset is recorded at fair value, changes in fair value are either reflected in the income statement as they occur, or are recorded in the “other comprehensive income” line in shareholder's equity on the balance sheet, bypassing the income statement.

Derivatives are recorded on the balance sheet at fair value and continually updated for market conditions. At the same time, however, companies own securities that are designated “not held for trading purposes”; and changes in the fair value of such securities, as well in the value of their receivables and or any loans they have made, would not affect the firm's earnings (in the absence of impairments). In such cases, changes in the value of the derivatives would flow through the income statement but the presumably offsetting (in an economic sense) changes in the value of the exposure hedged would generally not.

In some cases, derivatives positions will qualify for “hedge accounting,” in which case any losses on the derivatives position would be offset by gains on the bonds. But the requirements for a derivative to qualify for hedge accounting are quite restrictive. And if a hedge fails to qualify, it may well increase the volatility of accounting earnings even while reducing the volatility of economic earnings. In other words, the accounting outcome of hedging may be undesirable even though the economic outcome is highly desirable. And if the hedge will make accounting earnings more volatile, management has to recognize this ahead of time and then decide whether the benefits of the hedge are large enough to make the effect on its accounting income worthwhile.

In sum, when changes in the values of both the hedge instrument and the exposure being hedged go through the earnings statement, the hedge creates no artificial earnings volatility. And this means some companies (including those less concerned about reported earnings) will try to align accounting outcomes with economic outcomes by electing fair value treatment in which changes in fair value go through the earnings statement—while others will choose to use more expensive hedges that have less basis risk, so they can qualify for hedge accounting.

In Closing: Hedging, the “D Word,” and Explaining “Losses”
All the hedging examples discussed above involve the use of derivatives because they are usually the cheapest way to hedge. But companies may also be able to construct hedges out of comparatively conventional instruments like stocks and bonds. They may also make operating decisions that reduce risk (and so provide what are sometimes called “real hedges”). For example, multinationals sometimes locate plants in certain countries at least in part with the aim of limiting their exchange rate risks.

As we have seen, it is common for companies to “lose” on the derivatives side of a hedge. For some types of commonly used contracts, such as forward and futures contracts, the probability of a loss is close to 50%. Unless management has a crystal ball and could have predicted the losses on the derivatives, the derivatives loss has no implication for the quality of the hedge, or for whether the company’s decision to hedge was the right decision. Unfortunately and unfairly, though, derivatives losses routinely receive much worse press than losses from other sources.

What can companies do to put losses on hedging instruments in perspective? A risk management strategy cannot succeed over time unless the firm’s top management and board understand it and are comfortable with its potential results. If the CEO will judge a risk management strategy’s success by whether derivatives instruments make losses or not, the firm’s risk management may well prove counterproductive and end up destroying instead of preserving value.

As discussed earlier, management must thoroughly understand why the hedge was put on, and how it was expected to
create shareholder wealth at the time it was put on. Managers must understand that gains and losses on a well-constructed hedge are expected to increase the stability of a company’s earnings and value by offsetting losses and gains elsewhere in the firm. And equally important, management must take pains to communicate the firm’s risk management strategy to investors, including its expectation that a well-designed hedging policy will produce derivatives losses under certain scenarios. Just as few would conclude that homeowners were wrong to buy fire insurance because their houses did not burn down, no one should conclude that Exposure Inc. was wrong to buy exchange rate insurance because the exchange rate did not collapse.

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