

In a cash flow hedge, the firm marks the derivative to market, thereby recognizing the gain or loss in its value. The derivative will then show up on the balance sheet at its current market value. The firm then records that gain or loss in a separate category called Other Comprehensive Income or OCI. OCI is not an ordinary income account; it is actually a temporary capital account and appears next to equity in the balance sheet. Thus, gains and losses on derivatives go into capital. Then, at the hedge termination date, the underlying transaction, such as the firm taking out a loan, is completed. Then the derivative is removed from the books and the amount recorded to OCI is moved from OCI and adjusts the value of the underlying transaction as well as showing up in earnings. Thus, derivatives gains and losses do not affect income while the hedge is in place but instead show up in this temporary holding account, OCI, that appears as a part of capital. Ultimately, the transaction the derivative is designed to hedge is undertaken, and the derivatives gain or loss is moved to income as well as to the underlying transaction. In addition, cash flow hedge accounting requires a separation of a hedge's results into "effective" and "ineffective" components.

Let us consider an example of a loan that the firm anticipates. Suppose that six months from now the firm plans to issue a \$1,000,000 one-year zero coupon note. It buys an FRA to hedge against rising interest rates. While the hedge is in place interest rates go down and the FRA incurs a loss of \$10,000. Later, the FRA expires with a loss of \$12,000 and the note is issued. The firm issues the note at 7 percent for one year, thereby generating an initial cash inflow of  $(1 - 0.07)\$1,000,000 = \$930,000$ . With cash flow hedging, there would be an interim transaction of

Debit Other Comprehensive Income	\$10,000
Credit FRA	\$10,000

with the FRA showing up as a liability. When the loan is taken out, the transactions are

Debit Cash	\$930,000
Credit Notes Payable	\$930,000
Debit FRA	\$10,000
Debit Other Comprehensive Income	\$2,000
Credit Cash	\$12,000
Debit Notes Payable	\$12,000
Credit Other Comprehensive Income	\$12,000

The first entry reflects the fact that a note was issued for \$930,000 and cash was received. In the second entry, the FRA is removed from the books as a liability and a further \$2,000 loss is recorded in Other Comprehensive Income. Cash of \$12,000 is expended to cover the payout on the FRA. In the third entry, Other Comprehensive Income is closed out and the note balance is reduced from \$930,000 to \$918,000. In other words, we have now effectively borrowed \$918,000 and will later owe \$1 million.

Suppose, however, that this were not a perfect hedge. Assume that at the interim period, the loss was \$11,000 but the effective part of the loss was \$10,000. Thus, there is an ineffective part of the hedge that resulted in a loss of \$1,000. We would record the following entry:

Debit Current Income	\$1,000
Debit Other Comprehensive Income	\$10,000
Credit FRA	\$11,000

At expiration, let us say the cumulative loss on the FRA is \$15,000 and of that amount, \$12,000 is effective and \$3,000 is ineffective. The first entry above for the \$930,000 note is the same. The next two entries become:

Debit FRA	\$11,000
Credit Other Comprehensive Income	\$11,000
Debit Current Income	\$2,000
Debit Other Comprehensive Income	\$1,000
Debit Notes Payable	\$12,000
Credit Cash	\$15,000

The first entry above removes the FRA from liabilities and removes all but \$1,000 of the Other Comprehensive Income account. The third entry closes out Other Comprehensive Income and reduces Current Income by \$2,000. Notes Payable will go from \$930,000 to \$918,000, reflecting the loss of \$12,000 as the effective part of the hedge. The ineffective part is \$2,000, which goes into Current Income and combines with the \$1,000 previously added to Current Income in the earlier entry to reflect a \$3,000 loss for the ineffective part of the hedge.

As noted, cash flow hedging requires a separation of the effective and ineffective parts of hedging. The effective part is deferred and carried in the equity account whereas the ineffective part must be recorded immediately into income. The FASB has not prescribed precisely how the effective and ineffective components are to be separated. Rough rules of thumb have emerged suggesting that an effective hedge is one in which 80 to 125 percent of the gain or loss on the hedged instrument is matched with a gain or loss on the derivative. Nonetheless, the rules are still murky here and cash flow accounting remains somewhat more difficult to use, even though a firm may have no choice in whether it has to use it. In particular, futures, where maturities do not line up perfectly with hedge termination dates, are more likely to be ineffective hedges—at least by FASB rules—and, therefore, could lead to more volatile earnings.

As with fair value hedges, cash flow hedges must be well documented at the start and must be expected to be effective, and firms must specify how they will determine the hedge's effectiveness. Anticipated transactions must be highly likely to occur and the details of the transaction must be spelled out quite specifically. Generally, written options do not qualify.

### Foreign Investment Hedges

Foreign currency hedging had already been treated in Statement of Financial Accounting Standard 52 (SFAS 52), a document released a number of years prior to the release of FAS 133. The primary rules in SFAS 52 were retained. Firms often hedge currency translations of their foreign operations. These hedges are permitted and qualify for hedge accounting if certain conditions are met. Those conditions are similar to those we have previously identified. The hedges must be documented and expected to be effective. Measurement criteria for effectiveness must be clearly specified. Foreign currency hedges not designed to hedge translation can still qualify for fair value or cash flow accounting under the criteria listed above.

### Speculation

Trades that do not qualify for fair value, cash flow, or foreign currency hedge accounting must be considered speculation. Derivatives are marked to market, and gains and losses are recorded in current income with no offsetting adjustments to any other accounts.

### Some Problems in the Application of FAS 133

FAS 133 made substantial progress in clearing up a great deal of confusion over the proper accounting for derivatives. Nonetheless, it left some problems unresolved and generated some lingering concerns.

For example, FAS 133 does not prescribe what constitutes effective hedging. Thus, there is some fear that restatements of earnings will be required if later it is determined that the effectiveness test used by a firm is not acceptable. FAS 133 also requires that some embedded derivatives be stripped out and valued. This can be extremely complex and is subject to a wide margin of error. FAS 133 does not permit hedge accounting for bonds designed to be held to maturity. It reflects the all-too-common and naive view that as long as a bond is to be held to maturity, any losses in value are ultimately recouped. This ruling overlooks the opportunity cost of holding a bond in an environment of higher interest rates. It reflects, not surprisingly, an accounting view of a transaction rather than an economic view. Under FAS 133, valuation of derivative instruments and the corresponding hedged instrument is critical. Although we have placed a great deal of emphasis on valuation in this book, it is not a simple task for a firm to obtain a reliable value for a derivative or for the hedged instrument. Nonetheless, if FAS 133 forces firms to pay more attention to the market values of their derivatives and their hedged instruments, it probably serves a good purpose.

FAS 133 does not permit macro hedges. In a macro hedge, a firm takes all of its positions into account and hedges the net exposure. For example, a firm could have exposures to a variety of asset classes. Due to correlations among

those asset classes, there may be considerable risk reduction. The firm may then choose to hedge only the remaining risk. Yet, such hedges will now no longer qualify for hedge accounting. Hedges must be transaction specific.

## Disclosure

Closely related to the issue of accounting for derivatives is the matter of how much information about a firm's use of derivatives is disclosed in annual reports and 10-Ks. In 1997 the U.S. Securities and Exchange Commission ordered that large firms and banks would be required to provide more disclosure of their accounting policies with respect to derivatives; more quantitative and qualitative information about their market risk; and more information about instruments used, positions taken, commitments, and expected transactions. Companies must categorize their derivatives into one of two categories: trading, meaning essentially speculative, and non-trading, meaning essentially hedging.

For their quantitative disclosure, companies must present either (1) tabular information on the market values of their derivatives and relevant contract terms categorized by expiration date, (2) sensitivity analysis of potential losses, or (3) the Value at Risk. For their qualitative disclosure, companies must identify their primary exposures and how they manage those exposures.

The SEC's disclosure requirements have been controversial, requiring that firms reveal information that could be useful to competitors. Moreover, the requirement that firms reveal their financial risks and how they manage them overlooks the fact that firms face a variety of nonfinancial risks, which they are not required to disclose. For example, an airline faces the risk of a crash, resulting in catastrophic human and financial loss. Yet, it is not required to disclose how it manages that risk or what the effect of a crash would be on its VAR. Such rules have the potential for penalizing users who are prudently managing their financial risks.

## AVOIDING DERIVATIVES LOSSES

As we have seen throughout this book, derivatives are highly efficient instruments that can be used to manage risk. Nonetheless, part of the price we pay for such instruments is that they are highly leveraged and can be easily misused. Since every derivative generates a gain that is matched by a loss on the other side of the transaction, someone must lose money. In some cases, those losses have been large and surprising to those who incurred the losses. Large losses also tend to make for good headlines, and, consequently, many firms have found themselves embarrassingly portrayed on the front pages of newspapers. Table 16.1 contains a partial list of well-known derivatives losses incurred by organizations since 1988. The losses have ranged from small amounts to almost unbelievably large sums of money. The types of organizations and derivatives used have run the gamut. Fortunately, the incidence of losses, which seemed to peak around 1994, has decreased in recent years. We now take a look in more detail at four of the most celebrated stories of derivatives losses.

### Metallgesellschaft: To Hedge or Not to Hedge?

*Our proposed risk management program not only protects the pump profit margins with a minimum amount of risk from the spot market, but also offers us an opportunity for extraordinary upside profit with no additional risk.*

Metallgesellschaft's Business Plan  
Quoted in Antonio S. Mello and John E. Parsons  
"Maturity Structure of a Hedge Matters:  
Lessons from the Metallgesellschaft Debacle,"

Working Paper, February 1995, Columbia University

The industrial firm Metallgesellschaft A.G. (MG) was the fourteenth largest corporation in Germany in 1993. Founded in 1883, it employed 58,000 people, had 251 subsidiaries worldwide, and was engaged in a variety of businesses primarily related to mining, metals, and energy products. In late 1993 and early 1994, it incurred losses in futures trading totaling about \$1.3 billion, which was approximately one-half of its capital at that time. The losses were all the more remarkable for the fact that MG had traded futures successfully for many years. Although the firm

Table 16.1 Partial List of Organizations Reporting Derivatives Losses

Organization (Year)	Size of Losses	Transactions
First Boston (1987)	\$100 million	bond options
Merrill Lynch (1987)	£377 million	mortgage-backed securities
Harrinersmith and Fulham (1988)	£500 million	swaps
Allied Lyons (1991)	£150 million	currency options
Dell Computer (1992)	\$8 million	currency options and forwards
Belgian Finance Ministry (1992)	\$300 million	misc. derivatives
Showa Shell Shekiyu (1993)	¥165 billion	currency options and forwards
Metallgesellschaft (1993)	\$1.3 billion	energy futures
Codelco (1994)	\$207 million	copper futures
Cargill Minnetonka Fund (1994)	\$100 million	mortgage derivatives
Gibson Greetings (1994)	\$20 million	interest rate swaps
Kashima Oil (1994)	\$1.5 billion	currency derivatives
Mead (1994)	\$12.1 million	interest rate swap
Procter & Gamble (1994)	\$157 million	interest rate and currency swaps
Askin Capital Management (1994)	\$600 million	repurchase agreements and mortgage derivatives
Air Products and Chemicals (1994)	\$113 million	interest rate and currency swaps
Sandoz (1994)	\$78.5 million	misc. derivatives
Dell Computer (1994)	\$34.6 million	options and leveraged swaps
Arco Money Market Plus Fund (1994)	\$22 million	misc. derivatives
International Family Entertainment (1994)	\$2 million	misc. derivatives
Paine Webber Bond Mutual Fund (1994)	\$33 million	mortgage derivatives
Investors Equity Life Insurance Co. of Hawaii (1994)	\$90 million	bond futures
Bank of Montreal's Harris Trust and Savings Bank (1994)	\$51.3 million	mortgage derivatives
CS First Boston Investment Management (1994)	\$40 million	misc. derivatives
Glaxo (1994)	£115 million	mortgage derivatives
Federal Paper (1994)	\$19 million	currency derivatives
Caterpillar Financial (1994)	\$13.2 million	interest rate caps and swaptions
Piper Jaffray Cos. (1994)	\$700 million	mortgage derivatives
Odesa College (1994)	\$11 million	mortgage derivatives
Shoshone Indian Tribe (1994)	\$5 million	mortgage derivatives
Investors Equity Life (1994)	\$90 million	futures
Sears (1994)	\$237 million	swaps
Portage County, Ohio (1994)	\$8 million	mortgage derivatives and structured notes
Community A Management (1994)	\$44 million	structured notes
Three Farm Credit System Banks (1994)	\$23 million	structured notes
Chemical Bank (1994)	\$70 million	currency derivatives
Orange County, California (1994)	\$1.6 billion	leveraged repurchase agreements
Capital Corporate Federal Credit Union (1995)	\$126 million	mortgage derivatives
Barings PLC (1995)	£900 million	stock index futures and options
Connecticut Pension Fund (1995)	\$25 million	mortgage derivatives
Escambia County, Florida (1995)	\$19 million	mortgage derivatives
MCN Corporation (1995)	\$10 million	forwards
State of Wisconsin Investment Board (1995)	\$95 million	currency and interest rate swaps
Five clients of Morgan Stanley (1995)	\$28 million	forwards, options, repurchase agreements
Sumitomo Bank (1995)	\$1.8 billion	copper futures
The Common Fund (1995)	\$137.6 billion	stock index futures
Westchester Jewish Center (1995)	\$630,000	mortgage derivatives
First Capital Strategists (1995)	\$128 million	stock index futures
Postipankki (1995)	\$110 million	mortgage derivatives and structured notes

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Table 16.1

Organization (Year)	Size of Losses	Transactions
BZW (1996)	£11.5 million	currency derivatives
Seita (1996)	\$29.8 million	currency swaps
AT&T Pension Fund (1996)	\$150 million	options
NatWest (1997)	£90 million	interest rate options
JP Morgan/SK Securities (1997)	\$55 million	swaps
Massachusetts Pension Reserve (1998)	\$12 million	misc. derivatives
Griffin Trading (1999)	\$3.5 million	stock options
Sussex Futures (1999)	\$1 million	futures
Asia Pulp and Paper (2001)	\$220 million	swaps
National Australia Bank (2001)	\$1.75 billion	mortgage derivatives
American Express (2001)	\$370 million	collateralized debt obligations
Allied Irish Bank (2002)	\$691 million	currency options
Natexsis Banques Populaires (2002)	\$30 million	exotic equity options
Banca Popolare di Intra (2002)	€40 million	collateralized debt obligations
National Australia Bank (2004)	A\$360 million	currency options
China Aviation Oil (2004)	\$550 million	energy derivatives
Aman Capital (2004)	\$43 million	stock index derivatives
GLG Partners (2005)	\$2.5 billion	credit derivatives
China National Cotton Reserve Corp. (2004)	\$72 million	cotton futures
NIBC Petercam Derivatives (2005)	€60 million	exotic equity options
Belize (2005)	\$3 million	currency swaps

Sources: Information taken from a variety of sources, including various issues of *The Wall Street Journal*; Charles W. Smithson, *Managing Financial Risk: 1995 and 1996 Yearbooks* (Chase Manhattan Bank and CIBC Wood Gundy); *Euromoney*, August 1994; *Futures*, October 1995; and Brandon Becker and Jennifer Yoon, "Derivatives Financial Losses," *Journal of Corporate Law* 21 (Fall 1995): 215-239.

was saved by a \$1.9 billion bailout by a consortium of banks, the affair has raised concerns on several counts. If an extremely experienced firm can be nearly bankrupted trading derivatives, how can less-experienced firms expect to use them successfully? And, if losses of that size can be generated trading on the highly regulated exchange-listed futures markets, how dangerous can the unregulated over-the-counter markets be? MG's loss was all the more remarkable for the fact that *it was designed to be a hedge*. Or was it?

The troubles were caused by a U.S. subsidiary of MG called MG Refining and Marketing (MGRM). In 1992, MGRM developed a marketing strategy whereby it would offer to U.S. firms long-term fixed-price purchase contracts on gasoline, heating oil, and diesel fuel. MGRM's customers were able to lock in their purchase prices for up to ten years provided they agreed to buy from MGRM. These transactions were forward contracts at prices \$3 to \$5 per barrel lower than the spot prices at that time. Since MGRM was committed to delivering the products at expiration, it was short in the forward markets for these various energy products.

To hedge its risk MGRM entered into long futures contracts on the New York Mercantile Exchange. Its futures hedges accounted for about 40 percent of its commitment while over-the-counter derivatives contracts covered about 60 percent. Recognizing the illiquidity of all but the shortest futures contracts, MGRM hedged its position primarily in the shortest-term futures contracts for unleaded gasoline, heating oil, and crude oil. Its over-the-counter contracts were also short-term. MGRM also entered into a contract with a partially owned U.S. firm, Castle Energy, to purchase all of Castle's output at fixed margins for up to 10 years.

By late 1993, MGRM was long futures contracts for 55 million barrels of various energy products and had swaps in place to purchase at least another 100 million barrels. These quantities were almost precisely the amount of its forward commitments to its customers. In other words, MGRM used what we described in Chapter 10 as "a naive hedge ratio" of one-to-one.

As we have learned, however, a one-to-one hedge ratio is rarely appropriate. If the hedged instrument moves more or less than the hedging instrument, the position may be underhedged or overhedged. Also since the hedging instruments, futures, had a short maturity, they had to be rolled over as each contract expired. MGRM simply

settled up expiring contracts and purchased the next shortest maturity contract. This strategy, called a stack hedge or stack-and-roll hedge, works successfully provided that the markets were in backwardation, meaning, as we covered in Chapter 9, the more distant futures price was lower than the spot or nearby futures price. Energy markets are often in backwardation, a result of the convenience yield, a concept we also previously covered. We emphasize that while energy markets are *often* in backwardation, they can convert to contango without much notice and that is precisely what they did.

In late 1993, energy prices began falling and over the course of that year fell by almost a third. MGRM's long futures positions began incurring losses, resulting in large margin calls. While the firm was theoretically gaining on its fixed supply contracts, those gains would not be realized until the oil was delivered. As we noted, the delivery commitments were spread out up to ten years in the future. The company's realized losses drained its cash and its paper gains produced no cash to offset. Soon the company was staggering under the weight of these huge losses. The parent company had to make a decision about unwinding its position or continuing to fund the account. It chose to unwind. In retrospect that was the worst thing it could have done. In less than six months energy prices recovered all of their lost ground, meaning that MGRM's now unhedged short forward delivery contracts incurred further losses.

As we noted in the first paragraph of this story, the parent company was bailed out by a consortium of banks, some of which were on its own board of directors. The chairman of MG and the head of MGRM's U.S. oil trading operation were both fired and filed suits for conspiracy and defamation against their former employers. MG ultimately reported a loss of over \$1.7 billion for its fiscal year ending September 30, 1994.

It is not clear exactly why MGRM's hedge was so poorly balanced. Some experts suggest that MGRM was speculating and knew exactly what it was doing. Others say that MGRM had an effective hedge in place and could have produced the cash to meet its margin calls without liquidating its futures contracts, which, in hindsight, would have recouped their losses less than a year later. The CFTC, exercising a rarely used and somewhat controversial authority, fined MGRM \$2.2 million for failing to exercise adequate internal controls and ordered it to demonstrate in the future that such controls were in place.

## Orange County, California: Playing the Odds

*I am one of the largest investors in America. I know these things.*

Robert Citron

Quoted in Philippe Jorion

*Big Bets Gone Bad*, Academic Press, 1996

*Due to my inexperience, I placed a great deal of reliance on the advice of market professionals. ... I wish I had more training in complex government securities.*

Robert Citron

Testimony before Senate Special Committee

on Local Government Investments, January 17, 1995

Quoted in Risk, March, 1995

Orange County, California, is one of the wealthiest communities in the United States. Home to Disneyland, the California Angels, and the John Wayne airport, it reported a loss of \$1.6 billion in its investment account in 1994 and declared the largest municipal bankruptcy in U.S. history. How this could have happened is not at all a mystery. Orange County's treasurer, Robert Citron, was engaged in a clever investment scheme that turned a low-risk essentially money market fund into a turbo-charged investment account.

The 69-year-old Citron, with 24 years' experience as the county treasurer, operated a fund that invested in short-term, fixed-income securities. The fund not only invested Orange County funds but also accepted the funds of almost 200 other municipal governments in California. How it did this is not surprising. The Orange County fund had been earning 300 to 400 basis points above the returns earned on a similar fund operated by the state of California. The Orange County fund's market value was almost \$7.5 billion. In June 1994, Citron was reelected county treasurer in spite of warnings by his opponent that the portfolio was excessively leveraged.

By late 1994, a series of sharp increases in interest rates, triggered by the Federal Reserve's efforts to control inflation, brought the value of the fund down by a staggering \$2 billion. Orange County was forced to declare bankruptcy. Citron and his chief investment officer were arrested. Citron declared that he had been tricked by his brokerage firm, Merrill Lynch, into making these investments, about which he now stated that he knew little. Orange County went into reorganization, cut services drastically, laid off employees, and filed a \$3 billion lawsuit against Merrill Lynch.

It did not take long to determine what had gone wrong. Citron had used leverage to purchase additional government securities through reverse repurchase agreements. Recall from Chapter 9 that we introduced the concept of a repurchase agreement. Let us say that another municipality gives Mr. Citron \$100 million to invest. Citron purchases intermediate-term U.S. Treasury notes, which have an average maturity of about 4 years and a duration of about 3.5 years. Citron then executes a reverse repurchase agreement with a securities dealer or bank, pledging the \$100 million of securities for a loan of almost \$100 million, let us say \$90 million. He then uses the \$90 million to purchase additional similar securities. This can be done several times with the same money. Ultimately Citron had leveraged the county about threefold, bringing its total invested funds to about \$20 billion while its total equity was only about \$7 billion. This tripled its duration. Thus, what should have been a fairly low-risk, short- to intermediate-term fund had the risk of a fund of long-term bonds. When bankruptcy was declared and Citron's strategy was revealed, it should have come as no surprise. *The Wall Street Journal* had reported as early as April 1994 that Citron had leveraged the portfolio almost threefold. It was noted that one municipality withdrew about \$4 million at that time because it considered the fund too risky. This probably proved to be the best decision of that treasurer's career.

As in any leveraged bond investment, the results are quite good when interest rates are falling. When the 1994 interest rate increases caused the fund to have a series of huge margin calls from their broker, Orange County began dipping into its cash reserves. When it could no longer generate enough cash to meet its margin calls, its lenders began selling the collateral, which amounted to about \$10 billion. This sent shock waves into the bond market and prices tumbled.

It should be noted that the word *derivatives* has not been mentioned in conjunction with this Orange County story. Although there were some derivatives in the portfolio, mostly in the form of structured notes, the damage had little to do with derivatives. Citron had simply used U.S. government intermediate-term notes, combined with the leveraging power of repurchase agreements, to destroy almost 20 percent of the fund's value.

To say that Orange County invested unwisely and did not practice risk management is probably an understatement. There was no risk management whatsoever. Citron was supposed to be monitored by the elected county board but little monitoring was done. The board trusted the veteran treasurer and let him do what he wanted.

Orange County offered to repay the municipalities and other agencies whose funds it had invested about three-fourths of their money, plus other securities that would be repayable over a long period of time, but most of the payments were contingent on winning the lawsuit against Merrill Lynch. Almost 2,000 of the 15,000 county employees lost their jobs. The county sold nearly \$100 million of its assets and proposed a sales tax increase but the voters overwhelmingly turned it down. The county even tried to sell the John Wayne airport but found that the sale was not permitted by federal law. In 1996, Citron pled guilty to six felony counts and was sentenced to a year in jail and fined \$100,000. Orange County was able to issue new debt and to defer repayment of old debt, and by mid-1996 had emerged from bankruptcy. Eventually it settled its lawsuit with Merrill Lynch.

## Barings PLC: How One Man Blew Up a Bank

*Nick Leeson, whom most of you know and all of you have heard of, runs our operation in Singapore, which I want you to emulate.*

Ron Baker, Head, Financial Products Group, Barings  
Quoted in *Rogue Trader* by Nick Leeson, 1996, p. 143

Barings PLC was a British investment bank that had been founded in 1763. It had played a major role in British history, financing the Napoleonic Wars, and included Queen Elizabeth II among its many well-heeled clients. One weekend in February 1995 Barings was forced to declare bankruptcy, a result of losses of about \$1.2 billion or nearly twice its capital. The losses were attributed to futures trading in its Singapore office by a 28-year-old former clerk named Nick Leeson. Barings was rescued by the Dutch banking concern Internationale Nederlanden Groep (ING), which purchased its assets (approximately \$900 million) and assumed most of its liabilities for about \$1.61.<sup>1</sup> ING immediately injected about \$1 billion in capital. Some of Barings' liabilities, however, were not assumed and those bondholders suffered big losses.

Leeson had joined the bank in July 1989, having previously worked in London for the American bank Morgan Stanley. As a clerk handling the settling of transactions, he proved to be exceptionally well organized and his work in Barings' back office impressed his superiors. In March 1992 he requested and received a transfer to the Singapore office, which was actively involved in futures trading in Tokyo and Osaka, Japan, and at the Singapore International Monetary Exchange (SIMEX). Again Leeson proved to be excellent at organizing the back office. All the while, Leeson was learning the ropes of trading futures. Soon he was executing arbitrage transactions, buying Japanese stock index futures in Singapore and simultaneously selling the same contract in Osaka, capturing differences in the prices of the same contract on the two exchanges.

Transactions of this sort should be low risk. One position will gain and the other will lose a similar amount. The net should be a small profit resulting from slight differences in the prices of the contract on the two exchanges. As Leeson relates the story in his book, *Rogue Trader*, in 1992 he began hiding his losses in a special account. Soon it began appearing that Leeson was generating huge profits. Because Leeson was responsible for the back office and his employees were loyal to him, he was able to keep the losses tucked safely away whenever reports were required or auditors showed up. In 1994, he reported profits of about £28 million but had hidden losses of £180 million. From January 1, 1995, to February 24, Barings' last day, Leeson produced profits of almost £19 million and losses of over £600 million and it was getting increasingly difficult to cover his trail.

Recall from Chapter 7 that we discussed the straddle, a strategy involving long positions in puts and calls with the same exercise price. Leeson was generating more funds by entering into short straddles, a total of almost 20,000 contracts. This meant that Leeson profited as long as the market stayed fairly stable. With high volatility he would lose big. In late January 1995, Leeson held over 3,000 contracts long of the Japanese Nikkei 225 stock index futures at the Osaka exchange. On January 17, an earthquake struck the Japanese city of Kobe and the index fell about 13 percent over the next five weeks. Leeson was generating large losses but increased his bets that the market would turn around. Ultimately Leeson held a \$7 billion position that would gain if the market moved up and lose if it moved down. He held about 17,000 contracts in Osaka and over 40,000 in Singapore. He also held huge positions in Japanese government bonds and Euroyen.

The evidence suggests that Barings' executives in London had been warned about Leeson's trading as early as 1992. In 1994, an audit concluded that while Leeson had done nothing wrong, though in fact he had, the potential for wrongdoing was there. It noted that Leeson was running both the front office and back office, though generating large profits with little risk.

Thursday, February 23, was Leeson's last day of work at Barings' Singapore office. He and his wife secretly fled Singapore the next day. They went to several Asian countries before eventually flying to Frankfurt, Germany, where he was arrested by German police a week after fleeing Singapore. Singapore sought extradition while Leeson's British lawyers worked toward having him charged and extradited by England. British authorities were unable to determine that he had violated any of their laws and in October 1995 a German court agreed to turn him over to Singapore. Leeson returned to Singapore and plea bargained a potential 14-year prison sentence down to 6 1/2 years for fraud.

The Barings story shocked the financial world. There were concerns that the SIMEX clearinghouse might fail or use customer funds to cover its losses. The Bank of England, which had rescued Barings once in 1890, considered doing so again, but it quickly became apparent that only investors and not customers would lose money over the Barings failure. While the financial system suffered a shock, it showed no threat of widespread failure, the

<sup>1</sup>Yes, that is one dollar and 61 cents, which at that time was equivalent to approximately one British pound.



systemic risk that we previously mentioned. When ING purchased Barings about a week after the failure, the market settled down quickly and no further shocks were felt.

Barings is a classic story in bad risk management. It violates virtually every rule. Leeson was in control of both the back and front offices and, hence, had the ability to hide losses for an extremely long time. Barings' risk management system was nothing more than auditing and regular reports from Leeson showing his positions and performance. The reports were falsified and the auditors' examinations were not sufficient to identify the problem, though they did warn of the potential for fraud. It hardly mattered because they were ignored. The London office was under the impression that this 28-year-old clerk with no college degree was earning large profits arbitraging price differences in two markets. It never questioned how unlikely these profits really were.

Barings was a wake-up call to the rest of the financial world. Risk management became of paramount importance.

## Procter & Gamble: Going Up in Suds

*I've seen things in the market where I scratch my head and can't imagine why people did it. For example, when P&G lost all that money, I couldn't fathom what anyone at that company was thinking when they looked at that formula of the swap and said, 'Yes, that's exactly what I want to put on.'*

Anonymous

"Confessions of a Structured Note Salesman,"  
*Derivatives Strategy*, November 11, 1995

The Procter & Gamble Corporation (P&G) is one of America's best-known companies. It is also a large multinational corporation with extensive foreign operations and significant interest rate and foreign exchange risk. In late October 1993, P&G entered into an exotic swap with its dealer, Banker's Trust (BT). The payment on the swap was determined by a complex formula relating short-term interest rates to long-term interest rates. In early 1994, P&G entered into another exotic swap, this one linked to the exchange rate on the German mark. This transaction was similar to the range floaters that we discussed earlier. Both parties paid floating rates tied to German interest rates. P&G was betting on Deutsche mark swap rates staying between 4.05 percent and 6.10 percent. Both of its positions were essentially bets that U.S. and German interest rates would not increase significantly. If P&G was correct, it would be locking in an attractive below-market borrowing rate of 40 basis points below the commercial paper rate. If it were wrong, P&G would suffer large losses by being forced to borrow at substantially above market rates. The transactions also contained option features that allowed P&G to lock in a cumulative gain or loss.

In April 1994, P&G disclosed that it had taken a \$157 million pretax charge as a result of those transactions. Effectively P&G ended up borrowing at 1,412 basis points more than the commercial paper rate. Though the amount lowered its earnings per share only 15 cents, it became a public relations nightmare. P&G's treasurer Norman Mains was reassigned. Later in 1994, P&G filed suit against BT for \$130 million under four counts: fraud, negligent misrepresentation, breach of fiduciary duties, and negligence. P&G also pursued charges against BT under the federal RICO (Racketeering Influenced and Corrupt Organizations) Act, a law designed to punish organized crime. The RICO Act had been applied successfully in cases not involving organized crime and it permitted punishment of up to treble damages.

BT argued that P&G ran a sophisticated derivatives operation and was highly experienced in currency and interest rate derivatives. On that point, BT was certainly correct. P&G had many years of successful experience with these types of instruments, some of them being quite leveraged and exotic. So what was P&G's basis for arguing that BT had defrauded it? BT routinely tape recorded all its conversations with its derivatives clients. P&G got a court order to obtain the tapes and found that BT derivatives personnel had made statements to the effect that P&G had no idea it was being taken advantage of. P&G argued that BT was its advisor and that it had, therefore, relied on BT's advice and that it was fraudulent for BT to have led it into these transactions.

In the summer of 1996, BT's newly appointed chairman, though confident of a victory in court, elected to put the matter behind them by settling with P&G. BT ended up paying about \$80 million to P&G. BT had also settled

a number of other cases out of court. Regulators fined it and forced it to agree to take various actions to change its derivatives sales and operating procedures.

In response, a number of leading derivatives dealers organized an informal working group to develop self-regulatory procedures. Though these procedures are nonbinding, they represent an effort by the industry to develop standards of practice in derivatives sales and trading. Of particular note was the fact that, unless made specific, all transactions are at arm's length, meaning that the dealer is not an advisor to the end user.

## **RISK MANAGEMENT INDUSTRY STANDARDS**

The experience of organizations such as those discussed in the previous section has undoubtedly taught many lessons that have saved other organizations from loss and embarrassment. The industry has made many efforts to establish practices that lead to effective risk management. Two notable efforts in particular are the G-30 Report and the Risk Standards Working Group Report. The G-30, which stands for Group of 30, is a private international organization of economic and financial experts who study and evaluate various issues facing the international economic community. In 1993 the G-30 issued a report on derivatives practices. The key elements of the G-30 Report are provided in Table 16.2. The report is primarily aimed at the dealer community, but also contains recommendations for end users and even for regulators. The report emphasizes the importance of senior management's involvement in the process and the necessity for having an effective and independent risk management system in place. Note also the importance of such concepts as VAR, delta, gamma, and vega, the need for market *and* credit risk management, and the emphasis on netting.

The Risk Standards Working Group is an informal committee of consultants and practitioners from the institutional investment industry, which largely consists of pension funds. The group's efforts are directed toward improving risk management in the investment management business. The essential recommendations of the Risk Standards report are provided in Table 16.3. The report's emphasis is similar to that of the G-30 Report, but adapted to investment management organizations.

**Table 16.2** The Group of 30 Recommendations on Derivatives and Risk Management Practices

### **GENERAL POLICIES**

#### **Recommendation 1: The Role of Senior Management**

Dealers and end-users should use derivatives in a manner consistent with the overall risk management and capital policies approved by their boards of directors. These policies should be reviewed as business and market circumstances change. Policies governing derivatives use should be clearly defined, including the purposes for which these transactions are to be undertaken. Senior management should approve procedures and controls to implement these policies, and management at all levels should enforce them.

### **VALUATION AND MARKET RISK MANAGEMENT**

#### **Recommendation 2: Marking to Market**

Dealers should mark their derivatives positions to market, on at least a daily basis, for risk management purposes.

#### **Recommendation 3: Market Valuation Methods**

Derivatives portfolios of dealers should be valued based on mid-market levels less specific adjustments, or on appropriate bid or offer levels. Mid-market valuation adjustments should allow for expected future costs, such as unearned credit spread, closeout costs, investing and funding costs, and administrative costs.

#### **Recommendation 4: Identifying Revenue Sources**

Dealers should measure the components of revenue regularly and in sufficient detail to understand the sources of risk.

#### **Recommendation 5: Measuring Market Risk**

Dealers should use a consistent measure to calculate daily the market risk of their derivatives positions and compare it to market risk limits.

*Continued*

Table 16.2 (contd.)

- Market risk is best measured as "value at risk" using probability analysis based upon a common confidence interval (e.g., two standard deviations) and time horizon (e.g., a one-day exposure).
- Components of market risk that should be considered across the term structure include: absolute price or rate change (delta); convexity (gamma); volatility (vega); time decay (theta); basis or correlation; and discount rate (rho).

**Recommendation 6: Stress Simulation**

Dealers should periodically perform simulations to determine how their portfolios would perform under stress conditions.

**Recommendation 7: Investing and Funding Forecasts**

Dealers should periodically forecast the cash investing and funding requirements arising from their derivatives portfolios.

**Recommendation 8: Independent Market Risk Management**

Dealers should have a market risk management function, with clear independence and authority, to ensure that the following responsibilities are carried out:

- The development of risk limit policies and the monitoring of transactions and positions for adherence to these policies. (See Recommendation 5.)
- The design of stress scenarios to measure the impact of market conditions, however improbable, that might cause market gaps, volatility swings, or disruptions of major relationships, or might reduce liquidity in the face of unfavorable market linkages, concentrated market making, or credit exhaustion. (See Recommendation 6.)
- The design of revenue reports quantifying the contribution of various risk components, and of market risk measures such as value at risk. (See Recommendations 4 and 5.)
- The monitoring of variance between the actual volatility of portfolio value and that predicted by the measure of market risk.
- The review and approval of pricing models and valuation systems used by front- and back-office personnel, and the development of reconciliation procedures if different systems are used.

**Recommendation 9: Practices by End-Users**

As appropriate to the nature, size, and complexity of their derivatives activities, end users should adopt the same valuation and market-risk management practices that are recommended for dealers. Specifically they should consider: regularly marking-to-market their derivatives transactions for risk management purposes; periodically forecasting the cash investing and funding requirements arising from their derivatives transactions; and establishing a clearly independent and authoritative function to design and assure adherence to prudent risk limits.

**CREDIT RISK MEASUREMENT AND MANAGEMENT****Recommendation 10: Measuring Credit Exposure**

Dealers and end-users should measure credit exposure on derivatives in two ways:

- Current exposure, which is the replacement cost of derivative transactions, that is, their market value, and
- Potential exposure, which is an estimate of the future replacement cost of derivatives transactions. It should be calculated using probability analysis based upon broad confidence intervals (e.g., two standard deviations) over the remaining terms of the transactions.

**Recommendation 11: Aggregating Credit Exposures**

Credit exposures on derivatives, and all other credit exposures to a counterparty, should be aggregated taking into consideration enforceable netting arrangements. Credit exposures should be calculated regularly and compared to credit limits.

**Recommendation 12: Independent Credit Risk Management**

Dealers and end-users should have a credit risk management function with clear independence and authority, and with analytical capabilities in derivatives, responsible for:

- Approving credit exposure measurement demands.
- Setting credit limits and monitoring their use.
- Reviewing credits and concentrations of credit risk.
- Reviewing and monitoring risk-reduction arrangements.

Table 16.2 (contd.)

**Recommendation 13: Master Agreements**

Dealers and end-users are encouraged to use one master agreement as widely as possible with each counterparty to document existing and future derivatives transactions, including foreign-exchange forwards and options. Master agreements should provide for payments netting and close-out netting, using a full two-way payments approach.

**Recommendation 14: Credit Enhancement**

Dealers and end-users should assess both the benefits and costs of credit enhancement and risk-reduction arrangements. Where it is proposed that credit downgrades would trigger early termination or collateral requirements, participants should carefully consider their own capacity and that of their counterparties to meet the potentially substantial funding needs that might result.

**ENFORCEABILITY**

**Recommendation 15: Promoting Enforceability**

Dealers and end-users should work together on a continuing basis to identify and recommend solutions for issues of legal enforceability, both within and across jurisdictions, as activities evolve and new types of securities are developed.

**SYSTEMS, OPERATIONS, AND CONTROLS**

**Recommendation 16: Professional Expertise**

Dealers and end-users must ensure that their derivatives activities are undertaken by professionals in sufficient number and with the appropriate experience, skill levels, and degrees of specialization. These professionals include specialists who transact and manage the risks involved, their supervisors, and those responsible for processing, reporting, controlling, and auditing the activities.

**Recommendation 17: Systems**

Dealers and end-users must ensure that adequate systems for data capture, processing, settlement, and management reporting are in place so that derivatives transactions are conducted in an orderly and efficient manner in compliance with management policies. Dealers should have risk management systems that measure the risks incurred in their derivatives activities including market and credit risks. End-users should have risk management systems that measure the risks incurred in their derivatives activities based upon their nature, size, and complexity.

**Recommendation 18: Authority**

Management of dealers and end-users should delegate who is authorized to commit their institutions to derivatives transactions.

**ACCOUNTING AND DISCLOSURE**

**Recommendation 19: Accounting Policies**

International harmonization of accounting standards for derivatives is desirable. Pending the adoption of harmonized standards, the following accounting practices are recommended:

- Dealers should account for derivatives transactions by marking them to market, taking changes in value to income each period.
- End-users should account for derivatives used to manage risks so as to achieve a consistency of income recognition treatment between those instruments and the risks being managed. Thus, if the risk being managed is accounted for at cost (or, in the case of an anticipatory hedge, not yet recognized), changes in the value of a qualifying risk management instrument should be deferred until a gain or loss is recognized on the risk being managed. Or, if the risk being managed is marked to market with changes in value being taken to income, a qualifying risk management instrument should be treated in a comparable fashion.
- End-users should account for derivatives not qualifying for risk management treatment on a mark-to-market basis.
- Amounts due to and from counterparties should only be offset when there is a legal right to set off or when enforceable netting arrangements are in place.

Where local regulations prevent adoption of these practices, disclosure along these lines is nevertheless recommended.

**Recommendation 20: Disclosures**

Financial statements of dealers and end-users should contain sufficient information about their use of derivatives to provide an understanding of the purposes for which transactions are undertaken, the extent of the transactions, the degree of risk involved, and how the transactions have been accounted for. Pending the adoption of harmonized accounting standards, the following disclosures are recommended:

(contd.)

Table 16.2 (contd.)

- Information about management's attitude to financial risk, how instruments are used, and how risks are monitored and controlled.
- Accounting policies.
- Analysis of position at the balance-sheet date.
- Analysis of the credit risk inherent in those positions.
- For dealers only, additional information about the extent of their activities in financial instruments.

#### RECOMMENDATIONS FOR LEGISLATORS, REGULATORS, AND SUPERVISORS

##### Recommendation 21: Recognizing Netting

Regulators and supervisors should recognize the benefits of netting arrangements where and to the full extent that they are enforceable, and encourage their use by reflecting these arrangements in capital adequacy standards. Specifically, they should promptly implement the recognition of the effectiveness of bilateral close-out netting in bank capital regulations.

##### Recommendation 22: Legal and Regulatory Uncertainties

Legislators, regulators, and supervisors, including central banks, should work in concert with dealers and end users to identify and remove any remaining legal and regulatory uncertainties with respect to:

- The form of documentation required to create legally enforceable agreements (stature of frauds).
- The capacity of parties, such as governmental entities, insurance companies, pension funds, and building societies, to enter into transactions (*ultra vires*).
- The enforceability of bilateral close-out netting and collateral arrangements in bankruptcy.
- The enforceability of multibranch netting arrangements in bankruptcy.
- The legality/enforceability of derivatives transactions.

##### Recommendation 23: Tax Treatment

Legislators and tax authorities are encouraged to review and, where appropriate, amend tax laws and regulations that disadvantage the use of derivatives in risk management strategies. Tax impediments include the inconsistent or uncertain tax treatment of gains and losses on the derivatives, in comparison with the gains and losses that arise from the risks being managed.

##### Recommendation 24: Accounting Standards

Accounting standards-setting bodies in each country should, as a matter of priority, provide comprehensive guidance on accounting and reporting of transactions in financial instruments, including derivatives, and should work toward harmonization of standards on this subject. Also, the International Accounting Standards Committee should finalize its accounting standard on financial instruments.

Source: The Group of Thirty, *Derivatives: Practices and Principles* (1993).

Table 16.3 Risk Standards Working Group on Recommendations on Derivatives and Risk Management Practices for Institutional Investors

#### I. Management

##### Risk Standard 1: Acknowledgement of fiduciary responsibility

Fiduciary responsibilities should be defined in writing and acknowledged in writing by the parties responsible.

##### Risk Standard 2: Approved written policies, definitions, guidelines and investment documentation

The Primary and Manager Fiduciaries should approve formal written policies which reflect their overall risk management objectives. The Primary and Manager Fiduciaries also should approve investment guidelines, management agreements and all other contracts that govern investments. Technical terms should be defined. All policies, definitions, guidelines and investment documentation should be reviewed and updated as appropriate, and more often if significant market events or changes in strategy occur.

##### Risk Standard 3: Independent risk oversight, checks and balances, written procedures and controls

Oversight of compliance with risk policies should be independent of line investment activity and conducted according to up-to-date, written policies and procedures. Front, middle, and back office activities should be separate wherever possible and sufficient checks and balances and appropriate controls should exist. When separation is not possible due to limited staff, alternative checks, balances and controls should be established.

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Table 16.3 (contd.)

**Risk Standard 4: Clearly defined organizational structure and key roles**

Organizational structure and reporting lines should be defined clearly and distributed to all parties. Key personnel and their roles in all front, middle and back office areas should be identified. Changes in key personnel should be communicated immediately to all relevant parties.

**Risk Standard 5: Consistent application of risk policies**

The Primary Fiduciary's risk policies should apply both to internal and external managers and should be consistent across similar asset classes and strategies.

**Risk Standard 6: Adequate education, systems and resources, back-up and disaster recovery plans**

The Primary and Manager Fiduciaries should ensure that adequate education, systems and resources are available to implement and administer their risk policies. They should also establish and test back-up procedures and disaster recovery plans.

**Risk Standard 7: Identification and understanding of key risks**

Risks should be analyzed to determine relevancy. This entails understanding strategies and their vulnerabilities, as well as assumptions built into an instrument, system, process, model or strategy. Key risks should be reviewed periodically as well as when significant events occur.

**Risk Standard 8: Setting risk limits**

Risk limits should be set for the aggregate portfolio and all individual portfolios. These may include limits on asset classes, individual instruments and specific types of risk.

**Risk Standard 9: Routine reporting, exception reporting and escalation procedures**

The Primary and Manager Fiduciaries should specify what positions, risks and other information must be reported and to whom. This policy also should define what constitutes required reporting or an exception to guidelines, to whom the exception should be reported, what action must be taken for different levels of violation and what procedures must be followed for ongoing or increased violations.

## II. Measurement

**Risk Standard 10: Valuation procedures**

All readily priced instruments should be valued daily, less-readily priced instruments at least weekly and non-readily priced instruments as often as feasible and whenever a material event occurs. The pricing mechanism and methodologies must be known, understood, follow written policies and be applied consistently by the Primary and Manager Fiduciaries, Managers, custodian and other subcontractors.

**Risk Standard 11: Valuation reconciliation, bid/offer adjustments and overrides**

Material discrepancies in valuations from different sources should be reconciled following established procedures. A procedure for bid/offer adjustments and overrides to valuations should be established in writing and monitored independently.

**Risk Standard 12: Risk measurement and risk/return attribution analysis**

The Primary and Manager Fiduciaries should regularly measure relevant risks and quantify the key drivers of risk and return.

**Risk Standard 13: Risk-adjusted return measures**

Risk-adjusted returns should be measured at the aggregate and individual portfolio level to gain a true measure of relative performance.

**Risk Standard 14: Stress testing**

Simulation or other stress tests should be performed to ascertain how the aggregate portfolio and individual portfolios would behave under various conditions. These include changes in key risk factors, correlations or other key assumptions and unusual events such as large market moves.

**Risk Standard 15: Back testing**

Risk and return forecasts and models should be back tested at least quarterly and whenever material events occur to assess their reliability.

(contd.)

Table 16.3 (contd.)

**Risk Standard 16: Assessing model risk**

Dependence on models and assumptions for valuation, risk measurement and risk management should be evaluated and monitored.

**III. Oversight****Risk Standard 17: Due diligence, policy compliance and guideline monitoring**

The Primary and Manager Fiduciaries should perform frequent, independent reviews of all Managers' risk policies and controls. Where policies and controls fall short of the requirements set forth by the Primary or Manager Fiduciaries, plans for future compliance or corrective action should be documented and communicated. Managers should ensure continuing compliance with their clients' risk policies and guidelines.

**Risk Standard 18: Comparison of Manager strategies to compensation and investment activity**

The Primary Fiduciary should require each Manager to submit a statement of strategy and ensure that the Manager's activities and compensation are consistent with that strategy. Key risk and return factors should be documented and reviewed at least annually and updated whenever the strategy changes.

**Risk Standard 19: Independent review of methodologies, models and systems**

All methodologies, models and related systems should be independently reviewed or audited prior to use as well as annually. Significant market moves or changes in market practice should trigger interim reviews.

**Risk Standard 20: Review process for new activities**

The Primary and Manager Fiduciaries should document the review process for permitting the use of new instruments, strategies or asset classes. Policies for initiating new activities should be consistent with the Primary and Manager Fiduciaries' risk and return goals as well as the Manager's strategy and expertise.

Source: Capital Market Risk Advisors, <http://www.cmra.com>.

The risk management industry has made substantial progress in improving the practice of risk management. Though much has been learned from mistakes, much has also been learned from research and practice. Today risk management is firmly established as a serious profession that makes a significant contribution to global society.

## **RESPONSIBILITIES OF SENIOR MANAGEMENT**

It should be clear from the G-30 and Risk Standards reports that senior management is responsible for the risk management activities of any organization. Consequently, senior management must establish an organizational structure and procedures that ensure that the risk management function will be effectively carried out. Of course, senior management is not expected to have detailed hands-on knowledge of risk management. It must, however, provide that responsible personnel are in control of a firm's risk management practices. In this section we conclude by looking at a few general guidelines that senior management should follow to ensure that the risk management function is under control.

- *Establish written policies.*

A company should establish in writing its policies with respect to how risk will be managed within the company. These policies should identify the risks to which the company is exposed, and discuss its tolerance for risk and its willingness and capacity to bear risk. These policies should identify the objectives of the company's risk management program and define its expectations. They should define how and why derivatives can be used to manage risk. Finally, these policies should provide for and discuss how the policies will be reviewed and possibly adjusted over time.

- *Define roles and responsibilities.*

As we have previously mentioned, the company should have an independent risk monitoring system with clear lines of authority. Senior management must know who within the organization is taking risks. The organization must choose a structure that is clearly centralized or decentralized. The firm must determine whether the risk management system will be an integrative, firm-wide, enterprise risk management system, as opposed to a system in which risks are managed separately. Finally, the company must establish checks and balances.

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- *Identify acceptable strategies.*

The organization must identify which risks should be acquired, which risks should be managed, and which risks should be mitigated. It should define the scope of allowable derivatives activities. It should establish trading limits that apply at the overall firm level; the level of a division, group, or portfolio; and also the level of an individual.

- *Ensure that personnel are qualified.*

Senior management is always responsible for ensuring that personnel have the knowledge, ability, training, and resources to carry out their duties. Senior management will ordinarily focus primarily on senior-level officers and employers, who in turn are responsible for junior-level employees.

- *Ensure that control systems are in place.*

Senior management is responsible for ensuring that valuation and monitoring software, hardware, and personnel are in place. Again, this system must provide for independent risk monitoring, meaning that the risk manager must be responsible to senior management and not to traders. Control systems must specify limits and restrictions on trading, must be enforceable, must identify how exceptions to the rules can be handled, and must ensure that modern risk management techniques are used. Backup systems and periodic review of the control function must be provided. Senior management must also ensure that performance is evaluated on a risk-adjusted basis and that risk takers are compensated in a manner that does not encourage excessive risk taking.

## QUESTIONS AND PROBLEMS

1. Explain why end users, who conduct their risk management operations in the treasury department, should not require the treasury department to be a profit center.
2. Distinguish the typical objectives of a dealer engaging in a derivatives transaction from those of an end user.
3. Identify the two primary types of derivatives specialists within a dealer organization.
4. Discuss the advantages and disadvantages of a centralized versus a decentralized risk management operation of an end user firm.
5. Explain the difference between centralized and enterprise risk management.
6. Distinguish between the front office and the back office of a derivatives dealer. Explain why it is important to keep the front and back offices separate.
7. Explain why the traditional auditing function cannot serve as the risk management function.
8. Why is hedge accounting used and how can it be misused?
9. Explain how an organization determines whether a hedge is sufficiently effective to justify hedge accounting.
10. Describe the primary differences between accounting for fair value hedges and accounting for cash flow hedges.
11. Identify the three ways in which U.S. companies can satisfy the SEC requirement that they disclose how they use derivatives to manage risk.
12. Summarize in one sentence how each of the following organizations failed to practice risk management:
  - a. Metallgesellschaft
  - b. Orange County
  - c. Barings
  - d. Proctor and Gamble



13. Explain the difference between the purposes of the G-30 Recommendations and the Risk Standard Working Group Recommendations.
14. What responsibilities does senior management assume in a risk management system?
15. What is the most important component of an effective risk management system?
16. Briefly explain how speculative derivatives transactions are treated from an accounting perspective.
17. One responsibility of senior management is to identify acceptable risk management strategies. Identify three categories of risk, focusing on broad classifications and not on specific types of risks.
18. Identify and discuss five problems with regard to the application of FAS 133.
19. Suppose that a firm engages in a derivative transaction that qualifies for fair value hedging. The firm holds a security and hedges it by selling a derivative. During the course of the hedge, the security increases in value by \$20,000, while the derivative decreases in value by \$22,000. Explain what accounting entries would be done and how the firm's earnings and balance sheet would be affected.
20. Suppose that a firm plans to purchase an asset at a future date. The forward price of the asset is \$200,000. It hedges that purchase by buying a forward contract at a price of \$205,000. During the hedging period, the forward contract incurs a paper loss of \$15,000. At the end of the hedge, the forward contract has lost an accumulated value of \$20,000 and the asset is \$20,000 cheaper. Explain what accounting entries would be done and how the firm's earnings and balance sheet would be affected. What would be different if it were not an effective hedge?

