

## ACCOUNTING FOR DERIVATIVES UNDER SFAS NO. 133

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*The Financial Accounting Standards Board (FASB) recently released SFAS No. 133, Accounting for Derivative Instruments and Hedging Activities. This pronouncement is the result of prolonged deliberations that began in 1992 due to the increased use and complexity of derivatives, resulting in growing concern about the accounting and disclosure requirements for derivatives and hedging activities. SFAS No. 133 provides comprehensive guidance for all derivatives, even those instruments yet to be developed. The statement requires companies engaging in hedging transactions to recognize derivative financial instruments as assets and liabilities, and to measure them at fair value for all fiscal quarters of fiscal years beginning after June 15, 2000 (as amended by SFAS No. 137) with early adoption, but not retroactive application, allowed.*

*This paper discusses the economic use of derivatives, then outlines and illustrates the accounting for derivative instruments under SFAS No. 133. The application of SFAS No. 133 should increase the understandability of the risks associated with derivatives by requiring that all derivatives be measured at fair value and reported as assets or liabilities. In addition, applying SFAS No. 133 should reduce inconsistency, incomplete-*

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## THE MID-ATLANTIC JOURNAL OF BUSINESS

*ness, and complexity, since the statement provides (or subsequent interpretations will provide) comprehensive guidance for all derivatives and hedging activities, even those yet to be developed.*

### Introduction

The Financial Accounting Standards Board (FASB) recently released SFAS No. 133, *Accounting for Derivative Instruments and Hedging Activities*. This pronouncement is the result of prolonged deliberations that began in 1992 due to the increased use and complexity of derivatives that resulted in growing concern about the accounting and disclosure requirements for derivatives and hedging activities. SFAS No. 133 provides comprehensive guidance for all derivatives, even those instruments yet to be developed. The statement requires companies engaging in hedging transactions to recognize derivative financial instruments as assets and liabilities, and to measure them at fair value for all fiscal quarters of fiscal years beginning after June 15, 2000 (as amended by SFAS No. 137) with early adoption, but not retroactive application, allowed. The purposes of this paper are, first, to discuss the economics of using derivatives, then to introduce the common types of derivative financial instruments used to hedge market risk, and finally to illustrate accounting for derivatives under the provisions of SFAS No. 133.

### The Economics of Using Derivatives

The term "derivatives" is used to describe a variety of financial instruments whose value depends on, or is derived from, the value of an underlying asset, liability, interest rate, or index. Derivatives can be used to insulate a business from changes in market prices or rates that management cannot control. That is, companies make plans based on expectations of what prices will be over the near term. If prices differ, the result of operations will also differ from expectations. The use of derivatives to offset such differences is termed "hedging" and the risk that prices will change is termed "market risk." In general, hedging is effective in eliminating or reducing market risk because a price change in a properly structured hedging instrument moves in the opposite direction of a price change in the item being hedged. Businesses frequently use derivatives to hedge their market risks. While not as common, businesses will sometimes use derivatives to speculate.<sup>1</sup> Unlike hedging, speculation involves using derivatives not to offset the risk in some other business transaction or activity, but simply to enhance returns to investments.

The rest of this paper is organized as follows: the next section discusses the four categories of market risk as well as speculation, followed by a discussion of common types of derivatives with examples of each. We then discuss the provisions of SFAS No. 133, and finally illustrate the accounting with a numerical illustration.

### Categories of Market Risk

There are four categories of items that create market risk exposure which can be hedged by derivatives: (1) interest rates, (2) foreign exchange rates, (3) prices of equity securities, and (4) prices of commodities. In addition to managing risk, some companies may also use derivatives to speculate.

## BLANKLEY & SCHROEDER: ACCOUNTING FOR DERIVATIVES

### *Interest Rate Risk*

Interest rate risk is associated with bonds that stipulate a variable rate based on published floating interest rates, such as the prime interest rate in the United States or the London Interbank Offered Rate (LIBOR) in England. Assume, for example, that a company issued a \$10,000,000 variable rate bond based on LIBOR, which was 5% at the time the debt was issued. The company is exposed to the risk of increases in LIBOR that will cause increases in future interest payments. An increase in LIBOR to, say, 5.25% will result in the company's interest cost increasing annually by \$25,000.

### *Foreign Exchange Rate Risk*

Foreign exchange rate risk occurs because the relative values of currencies change. For example, on September 20, 1999 the dollar was worth approximately 104 yen; one year earlier, on September 20, 1998, the dollar was worth approximately 124 yen. If, on September 20, 1998, a United States company had contracted to purchase an asset from a Japanese company for 10,000,000 yen, and agreed to pay for this purchase one year later, it would experience a foreign exchange rate loss of \$15,509. That is, on September 20, 1998 the U. S. company could have purchased the 10,000,000 yen for \$80,645 ( $10,000,000/124$ ); whereas, on September 20, 1999 the company will be required to pay \$96,156 to acquire the 10,000,000 yen necessary to satisfy the obligation ( $10,000,000/104$ ). Because the company waited a year to pay for the asset, the true economic cost of the asset was approximately 19% higher than the original contract price due entirely to the fact that it took more dollars one year later to purchase the same number of yen.

### *Prices of Equity Securities*

Equity security price risk occurs because a company is holding a portfolio of equity securities whose values change periodically. A company that is planning on selling its portfolio of equity securities in the future and using the proceeds to finance an asset purchase is exposed to the risk that the price of the portfolio of securities may decrease before they are sold. For example, a company with a portfolio of equity securities of \$2,000,000 on January 1, 1998 would have experienced a loss of approximately \$100,000 at the end of the third quarter of 1998 if its portfolio of equity securities mirrored the changes in value experienced by the NASDAQ composite index.

### *Commodity Price Risk*

Commodity price risk occurs when a company plans to sell or buy a commodity in the future. Assume, for example, that a company needs 1,000,000 bushels of corn for production in September, six months from the current date. If the current price of corn is \$2.25 per bushel, and it budgets production based on that price, then the company is exposed to the risk that the price of corn will rise prior to delivery of the commodity. If the price rises by \$.15 per bushel by September, then the company would have to pay \$150,000 over budget to keep production at the planned level. In general, commodity price risk is the risk that the prices of needed commodities will rise or fall, depending on the needs of the business, prior to fulfillment of the contracts.

*Speculation*

Speculation involves "taking a position" on the future direction of price changes in any of the above four categories of market risk exposure. For example, a manufacturing company whose product does not require the use of oil may anticipate that the \$14.00 November, 1998 price of a barrel of oil will soon rise in price due to changing events in the Middle East. The company buys oil and then waits for the price to rise before selling. After making this investment, the company is exposed to the risk that the price of oil will decline. Speculation with derivatives is used by sophisticated traders and is based on their views of future market movements. The economics of the use of derivatives for speculative purposes is beyond the scope of this paper. We should note, however, that much of the concern over the proper disclosure of information concerning the use of derivatives now required by the Securities and Exchange Commission<sup>2</sup> stems from the large speculative derivative losses reported by several entities in the early 1990s.<sup>3</sup>

## Common Types of Derivatives

A variety of financial instruments can be used to offset market risk exposure. These financial instruments offer terms that adjust the timing and amounts of cash flows, or the variability of equity security and commodity prices. At present, derivatives can be categorized into five general types:

1. Forward contracts
2. Future contracts
3. Options
4. Swaps
5. Embedded derivatives or hybrids

*Forward Contracts*

Forward contracts are individually negotiated between a company and a financial institution. They obligate one party to buy, and another party to sell, a financial instrument or commodity at a future date. A United States company that does business in France, for example, may need francs for a contracted purchase of equipment to occur three months in the future. The company is exposed to foreign currency price change risk associated with changes in the relative values of the dollar and the franc. To offset, or hedge, this price change risk, the company can enter into an agreement to receive a given number of francs in the future for the current stated exchange rate between the dollar and the franc. As a result of this derivative transaction, changes in the exchange rate affecting the contracted purchase price will be offset by changes in the forward contract.

*Future Contracts*

Future contracts are, in essence, forward contracts traded on security exchanges; however, some important differences exist. Since forward contracts are individually negotiated, all of the terms can be structured to exactly match the hedged item. Future contracts are standardized with respect to quantities, delivery points and delivery times. Consequently, a specified quantity of a commodity will be delivered at a specified time at a specified location. This can result in some ineffectiveness between changes in the hedged item and changes in the future contract.

## BLANKLEY & SCHROEDER: ACCOUNTING FOR DERIVATIVES

### *Options*

Options provide their holders with the right, but not the obligation, to buy or sell a financial instrument or commodity at a predetermined price termed the “strike” or “exercise” price. Options can take the form of “calls” that enable the holder to buy the financial instrument or commodity at the strike price, or “puts” that enable the holder to sell the financial instrument or commodity at the strike price. Although options are not required to be exercised, they do require a payment, termed a premium, at the time they are acquired.

To illustrate the use of options, assume a company has a \$1 million investment in available-for-sale securities, and that it plans to finance the acquisition of new facilities six months from now by selling the securities. The company is exposed to the market risk associated with changes in the value of the securities. In order to protect itself, the company can purchase a put option allowing it to sell the stock to the seller of the option for the current price. If the value of the portfolio goes down to \$900,000, the company will be protected by the option. That is, the company will exercise the option and use the \$100,000 gain on the option to offset the \$100,000 decline in value of the investment. On the other hand, if the value of the stock goes up, the company will not exercise the option. The company’s only cost in either case will be the premium paid to acquire the option. Option valuation is a complex topic beyond the scope of this paper; however, option valuation is required under the provisions of SFAS No. 123, *Accounting for Stock Based Compensation*.<sup>4</sup>

### *Swaps*

In a swap agreement, two parties exchange recurring payments. The most common type of swap is an interest rate swap whereby one party’s current variable rate interest payment is exchanged for a fixed rate payment. The swap contract will typically identify a notional amount that will be used to calculate the interest payments, the frequency of the interest payments, and the dates on which the variable rate will be revalued. Swaps are used for hedging the risk associated with changes in interest rates, such as a variable interest rate bond. That is, a company issuing a variable interest rate bond faces the market risk of possible changes in the cash outflows for interest payments. Similarly, a company holding a variable rate investment in bonds faces the market risk of changes in cash inflows from decreasing interest rates. In either case, the acquisition of a receive-fixed, pay-variable interest rate swap will hedge the market risk associated with the variable rate debt or investment.

Assume, for example, that a company has a \$1,000,000 variable rate investment in bonds based on the United States prime interest rate acquired on December 31, 1996 when the prime was 7%. To hedge this investment, the company purchases a receive-fixed, 7%, pay-variable interest rate swap with a \$1,000,000 notional on December 31, 1996 also based on the prime interest rate. If on December 31, 1997 the prime interest rate falls to 6% and remains at 6% for all of 1998, the company will only receive \$60,000 in interest revenue from its investment rather than the \$70,000 that was anticipated. However, the interest rate swap will result in the company receiving an additional \$10,000 at the end of 1998.<sup>5</sup>

### *Embedded Derivatives - Hybrids*

Some contracts not satisfying the definition of a derivative financial instrument such as bonds, insurance policies, and leases, may contain implicit or explicit features that hedge market risk. The effect of embedding a derivative instrument in another type of contract, termed the “host contract,” is that some or all of the cash flows that would otherwise be required by the contract may be modified by the terms of the embedded derivative. For example, a note payable may contain an embedded interest rate swap that alleviates the risk associated with changing interest rates.

As indicated earlier, SFAS No. 133 requires companies to recognize derivative financial instruments as assets and liabilities, and to measure them at fair value. The FASB struggled with the definition of derivatives during the course of its deliberations. It was faced with the task of including those items it wanted to include and excluding those it wished to exclude. As a result, its definition of derivatives is:

A derivative instrument is a financial instrument or other contract with all three of the following characteristics:

- a. It has (1) one or more underlyings, and (2) one or more notional amounts or payment provisions or both. Those terms determine the amount of the settlement or settlements...and in some cases, whether or not a settlement is required.
- b. It requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors.
- c. Its terms require or permit net settlement, it can readily be settled net by a means outside the contract, or it provides for delivery of an asset that puts the recipient in a position not substantially different from net settlement (FASB 1998, para. 6).

The terms "underlying," "notional amount," and "settlement" are the key aspects of the FASB's definition of derivatives. An underlying is defined as a specified interest rate, security price, commodity price, foreign exchange rate index or some other variable; however, it is not the actual asset or liability. A notional amount is defined as a number of units of currency, shares, bushels, pounds or other units specified in the contract. The settlement of a derivative is determined by the interaction of the notional amount and the underlying which may be a simple multiplication or a complex formula (FASB 1998, para. 7).

The FASB was concerned that this definition might still include some types of contracts that it wished to exclude. Consequently the following types of transactions are specifically excluded:

- a. Regular-way security trades such as the purchase of an equity security on an organized securities market. (Such transactions are, in essence, forward contracts).
- b. Normal purchases and sales of inventory.
- c. Certain insurance contracts that fall under the provisions of SFAS No. 60.
- d. Certain financial guarantee contracts that are, in essence, insurance contracts.
- e. Certain non-exchange traded contracts that meet specified conditions as to type, price, or volume.
- f. Derivatives that serve as an impediment to recognizing a related contract as a sale and purchase.
- g. Contracts indexed in the company's own stock and classified as stockholders' equity.
- h. Employee stock compensation agreements.
- i. Contingent considerations from business combinations (FASB 1998, para. 10-11).

Accounting for the changes in the fair value of derivatives depends on whether the derivative qualifies for, and has been designated as, a hedge, and the reasons for engaging in the hedge. Either all or a portion of a derivative financial instrument may be designated as the hedging instrument. Gains and losses on derivative instruments are accounted for depending on how the instrument is classified. The four possible classifications are:

1. No hedging designation
2. Fair value hedge
3. Cash flow hedge
4. Foreign currency hedge

## BLANKLEY & SCHROEDER: ACCOUNTING FOR DERIVATIVES

### *No Hedging Designation*

In the event a company acquires a derivative and does not identify it as a hedge against an existing market risk, it is a speculative hedge and the special accounting treatment required by SFAS No. 133 is not applicable. All changes in the value of the derivative are reported in income in the period in which they occur.

### *Fair Value Hedge*

A fair value hedge is a derivative financial instrument that offsets a company's exposure to changes in the fair value of an asset or a liability, such as a forward contract that hedges a company's exposure to changes in the value of a commodity that is to be sold in the future. For fair value hedges, the gain or loss on the derivative instrument is reported as a component of earnings in the period in which the gain or loss arises. In addition, the gain or loss on the hedged item that counterbalances the change in value of the derivative is also reported in current earnings. The result is that gains and losses on the derivative are offset by the gains and losses on the hedged item.

The hedge qualifies as a fair value hedge if all of the following criteria are met:

- a. There is formal documentation of the hedging relationship and the entity's risk management objective and strategy for undertaking the hedge. This documentation includes identification of the hedging instrument and hedged item, the nature of the risk being hedged, and how hedge effectiveness will be judged.
- b. At the inception of the hedge, and on an ongoing basis, the hedging relationship is expected to be highly effective.
- c. If the hedging instrument is an option designated as hedging a recognized asset or liability, the hedge and hedging instrument provide as much potential for gains as they do for losses (FASB 1998, para. 20).

Additionally, the hedged items must satisfy the following criteria:

- a. The hedged item is specifically identified as either all, or a specific portion of, a recognized asset or liability or an unrecognized firm commitment.
- b. The hedged item presents an exposure to changes in fair value attributable to the hedged risk that could affect earnings.
- c. The hedged item is not (1) an asset or liability that is remeasured with the changes in fair value attributable to the hedged risk that is reported currently in earnings, (2) an investment accounted for by the equity method, (3) a minority interest in a consolidated subsidiary, (4) an equity investment in a consolidated subsidiary, (4) a firm commitment to enter into or dispose of a business combination or equity method investment, (6) an equity instrument issued by the entity and classified as a portion of stockholders' equity.
- d. If the hedged item is a debt security classified as held-to-maturity, the designated risk being hedged must be identified as changes in fair value attributable to the obligor's creditworthiness. If the risk being hedged is an option component of held-to-maturity securities allowing prepayment, the designated risk being hedged is the risk of changes in the entire fair value of that option.
- e. If the hedged item is a nonfinancial asset or liability, the designated risk being hedged is the risk of changes in the fair value of the hedged asset or liability.
- f. If the hedged item is a financial asset or liability, the designated risk being hedged can be (1) the risk of changes in the overall fair value of the entire hedged item, (2) the risk of changes in its fair value attributable to changes in market interest rates, (3) the risk

## THE MID-ATLANTIC JOURNAL OF BUSINESS

of changes in its fair value attributable to changes in the related foreign currency exchange rates, (4) the risk of changes in its fair value attributable to changes in the obligor's creditworthiness. (FASB 1998, para. 21).

*Cash Flow Hedge*

A cash flow hedge is a derivative financial instrument that offsets a company's exposure to the variability in expected cash flows. While these instruments can take many forms, a common example is an interest rate receive-fixed, pay-variable swap to offset the market risk associated with an investment in variable rate bonds as illustrated earlier. Another example could be hedging a forecasted purchase of rubber by a tire company with a futures contract. Since the gains and losses on the derivative instruments and the gains and losses on the hedged items frequently do not occur in the same accounting period for cash flow hedges, a different accounting treatment is required. Gains and losses on derivatives instruments are reported as a component of comprehensive income until such time as they can be used to offset gains and losses on the hedged item. When the expected cash flow from the hedged item actually occurs, the gains and losses on the derivative are transferred from comprehensive income to current earnings.

According to SFAS No. 133, a hedge qualifies as a cash flow hedge if all of the following criteria are met:

- a. There is formal documentation of both the hedging relationship and the entity's risk management objective and strategy for undertaking the hedge. This documentation is to include identification of the hedging instrument and hedged item, the nature of the risk being hedged, and how hedge effectiveness will be judged.
- b. At the inception of the hedge, and on an ongoing basis, the hedging relationship is expected to be highly effective.
- c. If the hedging instrument is an option, designated as hedging a recognized asset or liability, the hedge and hedging instrument provide as much potential for gains as they do for losses.
- d. If the hedging instrument is pay-variable, receive-variable interest rate, then the hedging instrument must be a link between an existing asset and a designated liability with variable cash flows losses (FASB 1998, para. 28).

Additionally, a forecasted transaction may be designed as a cash flow hedge if:

- a. The forecasted transaction is specifically designated as a single transaction or group of transactions.
- b. The occurrence of the forecasted transaction is probable.
- c. The forecasted transaction is with an external party.
- d. The forecasted transaction is not the acquisition of an asset or liability that is remeasured with the changes in fair value attributable to the hedged risk that is reported currently in earnings.
- e. If the variable cash flows of the forecasted transaction relate to held-to-maturity securities, the designated risk being hedged must be identified as a change in the cash flows attributable to default or the obligor's creditworthiness.
- f. The forecasted transaction does not involve a business combination, and is not a transaction involving (1) an investment accounted for by the equity method, (2) a minority interest in a consolidated subsidiary, (3) an equity investment in a consolidated subsidiary, (4) an equity instrument issued by the entity and classified as a portion of stockholders' equity.



## BLANKLEY &amp; SCHROEDER: ACCOUNTING FOR DERIVATIVES

- g. If the hedged transaction is the forecasted purchase or sale of a nonfinancial asset, the designated risk being hedged is (1) the risk of changes in the functional currency-equivalent cash flows attributable to changes in the related foreign currency exchange rates or (2) the risk of changes in the cash flows relating to all changes in the purchase price or sales price of the asset.
- h. If the hedged transaction is the forecasted purchase or sale of a financial asset or liability, or the variable cash inflow or outflow of an existing financial asset or liability, the designated risk being hedged must be (1) the risk of changes in cash flows of the entire asset or liability, (2) the risk of changes in its cash flows attributable to changes in market interest rates, (3) the risk of changes in the functional currency-equivalent cash flows attributable to changes in the related foreign currency cash flows, or (4) the risk of changes in its cash flows attributable to default or changes in the obligor's creditworthiness (FASB 1998, para. 29).

*Foreign Currency Hedge*

A foreign currency hedge is a financial instrument that offsets a company's exposure to the variability in foreign currency exchange rates, such as the purchase of a forward contract to buy francs at the current exchange rate discussed earlier. According to SFAS No. 133, the following types of hedges may be designated as foreign currency hedges:

- a fair value hedge of an unrecognized firm commitment or an available-for-sale security;
- a cash flow hedge of a forecasted foreign currency-denominated transaction or a forecasted intercompany foreign currency-denominated transaction;
- a hedge of a net investment in a foreign subsidiary (FASB 1998, para. 36).

## An Illustration of the Provisions of SFAS No. 133

The provisions of SFAS No. 133 relating to the designation of a hedge as (1) speculative, (2) a fair value hedge, and (3) a cash flow hedge will be demonstrated by using the following example:

On January 1, 1996, the McAlpine Corporation, an international company that raises capital in various markets throughout the world, had a \$2,000,000 investment in variable rate bonds that were initially issued at par in England to yield 7%. A new variable rate on these bonds is determined annually at LIBOR each December 31st. On January 1, 1996, the company also had a 7% fixed-rate bonds payable liability of \$2,000,000. On December 31, 1996, the interest rate on the variable investment in bonds rose to 8%, and on December 31, 1997 the interest rate fell to 6%. The company can hedge its market risk by entering into an interest rate swap. In the event that McAlpine does not enter into an interest rate swap, the interest revenue from the investment in bonds and the interest expense from bonds payable will be recorded as follows during 1996-98:

<u>Date</u>	<u>Applicable Interest Rate</u>	<u>Interest Revenue</u>	<u>Interest Expense</u>	<u>Applicable Interest Rate</u>
12/31/96	7%	\$140,000	\$140,000	7%
12/31/97	8%	160,000	140,000	7%
12/31/98	6%	120,000	140,000	7%

## THE MID-ATLANTIC JOURNAL OF BUSINESS

As a result, the revenue from its interest-receiving investment does not match the expense associated with its interest-paying liability. If McAlpine enters into a receive-fixed, pay-variable interest rate swap, the company can eliminate this receive-pay interest disparity. As indicated by SFAS No. 133, three possible treatments of this interest rate hedge are possible (1) no hedge designation, or speculative, (2) fair value hedge, and (3) cash flow hedge.

*Accounting for the Swap*

An interest rate swap involves the exchange of payments that are calculated at different rates. McAlpine has entered into a receive-fixed, pay-variable interest rate swap. The notional amount of this swap is \$2,000,000 and two interest rate changes occurred on December 31, 1996 and December 31, 1997. The swap is settled annually at the net amount of the difference between the rate exchanged and the rate received. For the first year, both the fixed and variable rate remained at 7%; consequently, no cash will be exchanged on December 31, 1996. However, on December 31, 1996 the variable rate rose to 8%, and as a result, the terms of the interest rate swap will require McAlpine to pay 8% and receive 7%. Since the expectation in this example is that interest rates will not change in the future, McAlpine will expect to pay \$20,000 in additional interest for the next two years. [ $\$2,000,000 \times (.08 - .07)$ ]. This amount will be recorded on December 31, 1996 at its present value of \$35,665.

At the end of 1997, the first payment of the two anticipated \$20,000 payments recorded December 31, 1996 will be made. This \$20,000 payment reflects \$2,853 of interest on the present value of the swap payable, and a \$17,147 reduction of the swap payable liability. Additionally, interest rates have now fallen to 6% resulting in the expectation of a \$20,000 gain on the swap [ $\$2,000,000 \times (.07 - .06)$ ] to be received December 31, 1998. This amount is recorded as a swap receivable at its present value of \$18,868, and the remaining swap payable balance of \$18,518 is eliminated from McAlpine's accounting records. The \$37,386 difference between the current carrying value of the swap payable on December 31, 1997, and the present value of the swap receivable will be recorded by McAlpine according to the provisions of SFAS No. 133 depending on its designation as discussed in the next section. Finally, on December 31, 1998, the swap receivable will be settled and McAlpine will receive \$20,000. Of this amount \$1,132 ( $\$18,868 \times .06$ ) will be recorded as interest revenue and the remaining \$18,868 will eliminate the swap receivable. In addition, both the investment in bonds and the bonds payable mature and will be eliminated from McAlpine's accounting records.

*No Hedge Designation*

If the hedge does not qualify for special accounting treatment, it is not necessary for McAlpine to designate its risk management strategy, identify the hedged item, identify the specific risk being hedged, or outline the method of assessing hedge effectiveness. Accounting for this hedge is similar to the treatment required prior to the issuance of SFAS No. 133, and McAlpine's financial statements for 1996, 1997, and 1998 will contain the following information concerning this hedge:

1996

Income Statement

## Other Revenue, Gains, Expenses and Losses

Interest Revenue	\$140,000
Interest Expense	(140,000)
Unrealized Loss- Swap	<u>(35,665)</u>
Total	\$ (35,665)

## BLANKLEY &amp; SCHROEDER: ACCOUNTING FOR DERIVATIVES

Balance Sheet

<u>Assets</u>		<u>Liabilities and Equity</u>	
Investment	\$2,000,000	Swap Payable	\$ 35,665
		Bonds Payable	2,000,000
		Retained Earnings	(35,665)

1997

Income Statement

## Other Revenue, Gains, Expenses and Losses

Interest Revenue	\$160,000
Interest Expense	(142,853)
Unrealized Gain - Swap	<u>37,386</u>
Total	\$ 54,533

Balance Sheet

<u>Assets</u>		<u>Liabilities and Equity</u>	
Swap Receivable	\$ 18,868	Bonds Payable	\$2,000,000
Investment	2,000,000	Retained Earnings	18,868

1998

Income Statement

## Other Revenue, Gains, Expenses and Losses

Interest Revenue	\$121,132
Interest Expense	<u>(140,000)</u>
Total	\$ (18,868)

Balance Sheet

<u>Assets</u>	<u>Liabilities and Equity</u>
No remaining effects	

Fair Value Hedge

In the event McAlpine is concerned about the effect on the value of the firm from possible downward changes in interest rates associated with the outstanding bond issue, the company can designate the interest rate swap as a fair value hedge. That is, as interest rates decline, the value of the bonds payable in the marketplace will increase, and therefore, decrease McAlpine Corporation's overall market value. If McAlpine designates the interest rate swap as a fair value hedge, it will disclose its risk management strategy as eliminating changes in the fair value of its fixed rate debt, designate the receive-fixed, pay-variable interest rate swap as the hedging instrument, designate the fixed rate debt as the hedged item, and designate the fair value of the fixed rate debt as the specific

## THE MID-ATLANTIC JOURNAL OF BUSINESS

risk being hedged. Since the hedged item and the hedging instrument terms exactly match, there will not be any ineffectiveness (discussed below) in the hedging relationship. Subsequently, all changes in value of the hedged item and the hedging instrument will be reported in current period income and McAlpine's financial statements for 1996, 1997, and 1998 will disclose the following information concerning the hedging relationship:

1996			
<u>Income Statement</u>			
Other Revenue, Gains, Expenses and Losses			
Interest Revenue		\$140,000	
Interest Expense		(140,000)	
Unrealized Gain- Bonds Payable		35,665	
Unrealized Loss - Swap		(35,665)	
Total		\$ 0	
<u>Balance Sheet</u>			
<u>Assets</u>		<u>Liabilities and Equity</u>	
Investment	\$2,000,000	Swap Payable	\$ 35,665
		Bonds Payable	1,964,335

Since the interest revenue from the investment in bonds rises at December 31, 1996 to 8%, the value of the bonds falls. This event will be exactly offset by a loss on the swap. These amounts are calculated as follows. In 1996, the unrealized gain on the bond payable is calculated by adding the present value of the two remaining interest payments of \$140,000 and the present value of the principal repayment due in two years at the current interest rate of 8%, and then deducting it from the face value of the bonds. This amount, which is \$1,964,335, is \$35,665 less than the original carrying value of the bonds and results in an increase in the value of the firm which is recorded under the provisions of SFAS No. 133 for fair value hedges. This amount is offset on the income statement by the previously calculated loss on the swap payable.

1997			
<u>Income Statement</u>			
Other Revenue, Gains, Expenses and Losses			
Interest Revenue		\$160,000	
Interest Expense		(160,000)	
Unrealized Loss on Bonds		(37,386)	
Unrealized Gain Swap		37,386	
Total		\$ 0	
<u>Balance Sheet</u>			
<u>Assets</u>		<u>Liabilities and Equity</u>	
Swap Receivable	\$ 18,668	Bonds Payable	\$2,018,868
Investment	2,000,000		

## BLANKLEY & SCHROEDER: ACCOUNTING FOR DERIVATIVES

In 1997, the bond interest expense is calculated as the sum of the 8% interest on the current carrying value of the bonds payable of \$1,964,335 equaling \$157,147, plus the previously calculated interest of \$2,853 on the swap payable. The new carrying value of the bond is the present value of one interest payment of \$140,000 due in one year, plus the present value of the principal amount of \$2,000,000 due in one year at the new interest rate of 6%, or \$2,018,868. The unrealized loss on the bonds is calculated as follows:

Carrying value 12/31/96		\$1,964,335
Interest expense @ 8%	\$157,147	
Cash paid (\$2,000,000 x .07)	<u>140,000</u>	
Increase in bond carrying value		<u>17,147</u>
		\$1,981,482
Less: Carrying value 12/31/97		<u>(2,018,868)</u>
Unrealized loss		\$ (37,386)

1998

### Income Statement

Other Revenue, Gains, Expenses and Losses	
Interest Revenue	\$121,132
Interest Expense	<u>(121,132)</u>
Total	\$ 0

### Balance Sheet

<u>Assets</u>	<u>Liabilities and Equity</u>
No remaining effects	

In 1998 the interest revenue is calculated as the sum of the 6% interest on the variable rate investment or \$120,000, plus the previously calculated interest on the swap receivable of \$1,132. Interest expense is calculated as the 6% interest on the bond carrying value of \$2,018,868 or \$121,132. The difference between the \$140,000 cash actually paid, and the \$121,132 of interest on the current carrying value of the bonds at 6%, is amortized and reduces the bond carrying value to \$2,000,000. The investment in bonds of \$2,000,000 and the bonds payable of \$2,000,000 will be retired at the end of 1998 and removed from McAlpine's accounting records.

### Cash Flow Hedge

If, alternatively, McAlpine is most concerned about the risk of changing cash flows associated with its variable rate investment in bonds, it will designate the interest rate swap as a cash flow hedge. In this situation, McAlpine will define its risk management strategy as eliminating the variability in cash flows associated with its variable rate investment in bonds, identify the hedging instrument as a receive-fixed, pay-variable interest rate swap, define the hedged item as the three interest revenue receipts due on its variable rate investment in bonds, and designate the specific risk being hedged as possible changes in cash flows from its variable rate investment due to changes in interest rates. Again, since the terms of the hedging instrument and the hedge item match, there will not be any ineffectiveness. In this case, the hedging instrument's gain or loss will first be reported in other

## THE MID-ATLANTIC JOURNAL OF BUSINESS

comprehensive income and reclassified in earnings in the period in which the hedged item affects earnings. For example, the entire unrealized loss on the swap of \$35,665 in 1996 will be reported in other comprehensive income because no corresponding revenue or gain was recorded. \$20,000 of this amount will be recognized in 1997 as the first \$20,000 payment on the swap payable is recorded. McAlpine's financial statements will disclose the following information regarding a cash flow hedge for 1996, 1997, and 1998:

1996

Income Statement

Other Revenue, Gains, Expenses and Losses	
Interest Revenue	\$140,000
Interest Expense	<u>(140,000)</u>
Total	\$ 0
Other Comprehensive Income	
Unrealized Loss on Swap	(\$35,665)

Balance Sheet

	<u>Assets</u>		<u>Liabilities and Equity</u>
Investment	\$2,000,000	Swap Payable	\$ 35,665
		Bonds Payable	2,000,000
		Other Comprehensive Income	(35,665)

As noted above, the unrealized loss on the swap is reported as other comprehensive income at the end of 1996.

1997

Income Statement

Other Revenue, Gains, Expenses and Losses	
Interest Revenue	\$160,000
Interest Expense	<u>(160,000)</u>
Other Comprehensive Income	
Gain on Swap	\$37,386
Reclassification Adjustment	<u>(20,000)</u>
Total	\$17,386

Balance Sheet

	<u>Assets</u>		<u>Liabilities and Equity</u>
Swap Receivable	\$ 18,868	Bonds Payable	\$2,000,000
Investment	2,000,000	Other comprehensive Income	18,868

## BLANKLEY &amp; SCHROEDER: ACCOUNTING FOR DERIVATIVES

In 1997, the total interest expense is the sum of the \$140,000 cash interest paid on the bonds plus the \$20,000 reclassification adjustment. The gain on the swap resulting from the interest rate change on December 31, 1997 is recorded in other comprehensive income, and \$20,000 of the previously recorded loss is reclassified from other comprehensive income into earnings.

1998	
<u>Income Statement</u>	
Other Revenue, Gains, Expenses and Losses	
Interest Revenue	\$140,000
Interest Expense	<u>(140,000)</u>
Total	\$ 0
Other Comprehensive Income	
Gain on Swap	\$ 1,132
Reclassification Adjustment	<u>(20,000)</u>
	\$ (18,868)
<u>Balance Sheet</u>	
<u>Assets</u>	<u>Liabilities and Equity</u>
No remaining effects	

At the end of 1998, the \$1,132 interest revenue on the swap receivable is recorded in other comprehensive income resulting in a balance of \$20,000. This amount is subsequently reclassified into earnings as interest revenue. The \$18,868 decrease in other comprehensive income reported in 1998 reduces the previous balance to zero.

Effectiveness

Effectiveness is defined as the derivative instrument's ability to generate offsetting changes in the fair value or cash flows of the hedged item. For both fair value and cash flow hedges, the hedge must demonstrate "high correlation," which can be interpreted as meaning that the hedging instrument offsets between 80% and 125% of the changes in fair value or cash flows of the hedged item. Effectiveness must be measured at the inception of the hedging relationship and subsequently whenever earnings are reported or, at a minimum, quarterly.

If the highly effective test is not met, the entire hedge is disqualified from the special accounting treatment required by SFAS No. 133 and will be accounted for as a speculative hedge. However, even in a highly effective hedge, some ineffectiveness may occur and a portion of the difference between the changes in fair value or changes in the cash flows of the hedged item, and the change in value or cash flows of the hedging instrument may be recorded in earnings. Among the items that might generate ineffectiveness are different values of the hedged item and notional amount, and differing underlying interest rates such as prime vs. LIBOR.

For example, assume that the McAlpine Corporation continues to have a variable rate investment in bonds and outstanding fixed rate bonds payable as illustrated in the previous example. The company acquires a receive-fixed, pay-variable interest rate swap that is based on the prime interest rate in the United States, and, since its fixed rate bonds were issued in London, changes in the

## THE MID-ATLANTIC JOURNAL OF BUSINESS

fair market value of the investment in bonds are associated with changes in the value of LIBOR. McAlpine designates the interest rate swap as a cash flow hedge, and indicates that effectiveness is to be assessed by the extent to which changes in the cash flow associated with the interest rate swap offset changes in the cash flows associated with the variable rate investment in bonds. If, at the end of 1996, the prime interest rate in the United States only increased to 7.5%; while, LIBOR increased to 8%, the cash flow hedge would not be considered effective. The ineffectiveness arises because the hedging instrument—the interest rate swap based on the U. S. prime rate of 7.5%—only offsets 50% of the 1% change in the hedged item—the changing cash flows from the variable rate investment at 8%.

Alternatively, if McAlpine designated the interest rate swap as a fair value hedge, and indicated that effectiveness was to be assessed on the basis of how changes in the present value of the swap offset changes in the fair market value of its outstanding bonds payable, the hedge would also be considered ineffective because the change in the market value of the bonds valued at LIBOR at \$1,964,335 or a discount of \$35,665, would not be effectively hedged by the change in the value of the hedging instrument to 1,982,357 or a discount of \$17,643. That is, the hedge effectiveness would only be approximately 49% (\$17,643/35,665).

On the other hand, if McAlpine acquires a receive-fixed, pay variable interest rate swap based on the United States prime interest rate, and the prime rate increases to 7.9%,<sup>7</sup> the hedge will meet the overall effectiveness test for both fair value and cash flow hedges, but that portion of the hedge that is ineffective will be reported in current earnings as illustrated below for fair value and cash flow hedges.

Fair Value Hedge

McAlpine's financial statements for 1996 will disclose the following information relating to a fair value hedging relationship:

1996			
<u>Income Statement</u>			
Other Revenue, Gains, Expenses and Losses			
	Interest Revenue		\$140,000
	Interest Expense		(140,000)
	Unrealized Gain- Bonds Payable		35,665
	Unrealized Loss - Swap		(32,099)
	Total		\$ 3,566
<u>Balance Sheet</u>			
	<u>Assets</u>		<u>Liabilities and Equity</u>
Investment	\$2,000,000	Swap Payable	\$ 32,099
		Bonds Payable	1,964,335
		Retained Earnings	3,566



## BLANKLEY & SCHROEDER: ACCOUNTING FOR DERIVATIVES

The carrying value of the bonds is reduced because the variable rate based on LIBOR has increased. The loss on the swap is calculated as the present value at 8% of the difference between \$158,000 ( $\$2,000,000 \times .079$ ) and \$140,000 ( $\$2,000,000 \times .07$ ), or \$18,000 for two years. Since the amount of the loss on the swap did not exactly match the gain on the bonds, the \$3,566 is reported as a gain in income.

At the end of 1997 and 1998, interest revenue and interest expense will be recorded and the settlement payment on the swap payment will be made. Ineffectiveness will be measured on these dates as the difference between the interest revenue on the investment and interest expense on the sum of the interest on the carrying value of the bonds and the interest on the swap payable.

### Cash Flow Hedge

If McAlpine designates the interest rate swap as a cash flow hedge, the financial statements will appear as follows:

1996

#### Income Statement

##### Other Revenue, Gains, Expenses and Losses

Interest Revenue	\$140,000
Interest Expense	<u>(140,000)</u>
Total	\$ 0

##### Other Comprehensive Income

Unrealized Loss on Swap	\$ (32,099)
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#### Balance Sheet

	<u>Assets</u>		<u>Liabilities and Equity</u>
Investment	2,000,000	Bonds Payable	\$2,000,000
		Swap Payable	32,099
		Other Comprehensive Income	(32,099)

Initially at the end of 1996, the entire unrealized loss will be disclosed in other comprehensive income and no ineffectiveness will be recognized.

1997

#### Income Statement

##### Other Revenue, Gains, Expenses and Losses

Interest Revenue	\$160,000
Interest Expense	<u>(158,000)</u>
	\$ 2,000

##### Other Comprehensive Income

Reclassification Adjustment	<u>18,000</u>
Total	\$ 18,000

## THE MID-ATLANTIC JOURNAL OF BUSINESS

<u>Balance Sheet</u>			
	<u>Assets</u>		<u>Liabilities and Equity</u>
Investment	2,000,000	Bonds Payable	\$2,000,000
		Swap Payable	16,636
		Other Comprehensive Income	(16,636)

On December 31, 1997, the amount of ineffectiveness recognized will be the difference between the amount of interest revenue on the bonds less the sum of the interest expense on the bonds payable and the \$18,000 reclassification adjustment due to the recognition of one year of interest on the interest rate swap at 7.9%. A similar amount of ineffectiveness will be recognized at the end of 1998.

## Summary and Conclusions

This paper discussed the economic use of derivatives, then outlined common derivative instruments. The new requirements outlined in SFAS No. 133 appear to be a major improvement over previous accounting. A basic objective of financial reporting is to provide users with useful information that is both relevant and reliable. The application of SFAS No. 133 should increase the understandability of the risks associated with derivatives by requiring that all derivatives be measured at fair value and reported as assets or liabilities. Under previous requirements it was difficult to determine the economic effects of derivatives since the financial statements often did not report the rights or obligations associated with derivative instruments. That is, previous accounting guidance was developed in a piecemeal fashion and was limited to certain types of transactions. However, as new instruments were developed, accounting by resemblance was necessary since these instruments had not been specifically addressed.

The application of SFAS No. 133 should reduce inconsistency, incompleteness and complexity, since the statement provides (or subsequent interpretations will provide) comprehensive guidance for all derivatives and hedging activities, even those yet to be developed. These new requirements appear to be a major improvement over previous accounting; however, no method is without its critics. A major complaint is that the new requirements will result in volatility in earnings and stockholders' equity.

Bankers, among the most vocal of SFAS No. 133's critics, argue that this volatility in earnings and reported capital levels may give an inaccurate picture of banks' financial conditions. However, others counter that previous reporting practices obscured the existing volatility, and that the new requirements do not create volatility, they only expose it.

Bankers have also maintained that, in managing this volatility, companies may be discouraged from using prudent risk management activities. On the other hand, companies have made, and will continue to make, poor economic decisions trying to achieve favorable financial statement results, and the possibility that some firms will probably also make poor economic decisions regarding risk management activities should not be viewed as a weakness of SFAS No. 133.

In summary, the provisions of SFAS No. 133 have been met with general acceptance by the business and investment community and are strongly endorsed by the Securities and Exchange Commission. Although not a perfect approach, the new method should provide users with more useful information to appropriately assess the effects of derivative transactions.

## BLANKLEY &amp; SCHROEDER: ACCOUNTING FOR DERIVATIVES

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## Endnotes

<sup>1</sup> Many firms have a stated policy against using derivatives for speculative or "trading" purposes. Blankley, Lamb and Schroeder (1998) found that 63% of the 30 largest industrial firms have a stated policy against using derivative instruments for trading purposes.

<sup>2</sup> In 1997, the Securities and Exchange Commission amended Regulation S-X to require companies to disclose quantitative and qualitative information about the market risk associated with their use of derivatives. For a discussion of these requirements and illustrations of the types of disclosures required see Linsmeier and Pearson (1997) and Blankley, Lamb, and Schroeder (1998).

<sup>3</sup> Entities such as Proctor and Gamble, Showa Shell Sekiya, Arco, and Orange County, CA, for example, all reported large derivatives losses in the early 90's. For a review of this issue see Loomis (1994) and (1995), and Bishop (1996).

<sup>4</sup> For a discussion of accounting for options see Mountain (1996).

<sup>5</sup> Interest rate swaps are generally settled annually at the net amount of the difference between the fixed and variable rates times the notional amount. In this case, the calculation is \$1,000,000 x 1%.

<sup>6</sup> For the sake of simplicity, it is assumed that the interest rate changed only once each year on December 31, 1996 and 1997, and that on each of these dates McAlpine's management expected no further change in interest rates. This is termed a "horizontal yield curve," and while not a particularly realistic assumption, it is used to illustrate the issues involved in the least complicated manner. A more usual situation is frequently changing rates with the anticipation of additional changes in rates. This situation, which results in more complicated computations is termed an "upward sloping yield curve" where interest rates are higher for payments due farther into the future. SFAS No. 133 provides an illustration of this situation in paragraphs 131-139.

<sup>7</sup> Assume, for simplicity, that no other changes in interest rates take place or are anticipated.