

A Derivatives and hedging primer

A.1 Introduction

This primer will introduce you to some of the reasons why companies adopt hedging strategies, the hedgeable exposures and risks that companies face and some common hedge strategies that are used to manage these exposures and risks.

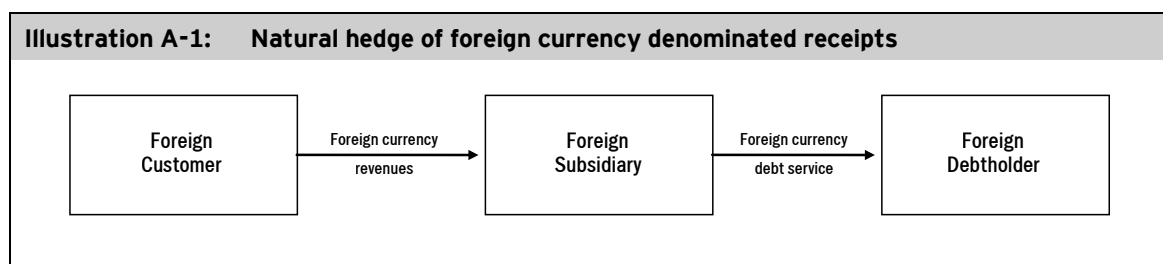
A.2 Why do companies hedge?

Companies enter into hedging transactions for a variety of reasons. An important reason to hedge exposures is to eliminate variability and volatility in financial performance, and/or to eliminate variability in cash flows over time. Consistent and predictable financial performance is important to the investment community, as analysts and investors tend to reward companies with stable, upward trends in earnings. Companies like to avoid surprising the investment community; volatility in earnings implies risk. Earnings volatility may depress stock prices and/or increase borrowing costs, which management clearly wants to avoid. Effective hedging programs also allow management to more accurately predict financial performance and manage the investment community's expectations. The ability to accurately forecast revenues and associated expenses allows managers to budget effectively and, to the extent that the budgetary process provides inputs to management's estimates of overall performance, financial performance will be more predictable.

As we will see below, certain hedges attempt to provide symmetrical returns (where the hedge is designed so that any gains or losses related to the hedged item are offset by gains or losses on the derivative) while other programs seek to provide asymmetrical returns (where the hedge eliminates a downside exposure while allowing the company to experience favorable market changes related to the hedged item). Symmetrical hedge strategies are designed to "lock in" a company's returns while asymmetrical hedge strategies can be analogized to insurance, where the hedge acts as protection against losses.

A.3 Does a company have to use derivatives to hedge its exposures?

Companies often modify their exposures to a variety of risks without using derivatives by changing their capital structures or entering into non-derivative transactions; transactions of this type are typically called "natural hedges". For example, a foreign subsidiary of a US based company may opt to borrow in the foreign currency, thereby matching cash inflows (foreign currency denominated revenues) with cash outflows (foreign currency denominated debt service). If the foreign subsidiary borrowed in US dollars rather than the foreign currency, its cash flows would be sensitive to changes in the foreign currency exchange rate. If the dollar strengthened against the foreign currency, additional amounts of foreign currency would be required to satisfy the subsidiary's US dollar denominated obligations. (See Exhibit 1).



Another example is a financial institution that enters into natural hedges to offset exposures that result from its operations. Because of the wide variety of products offered by typical large financial institutions, such as commercial lending, mortgage lending, deposit taking, and capital markets activities, these institutions must constantly assess the level to which their positions and balances have created exposures and the types of transactions that can be entered into to hedge these exposures. A simple example of this type of natural hedge would be an investment in a 1 year US Treasury note as a hedge of a 1 year certificate of deposit liability. If the certificates of deposit were not hedged, the financial institution would be exposed to the risk of changes in rates; it is obligated to pay a fixed rate to the holders of the certificates of deposits. If the 1-year investment were instead a six-month investment, the bank's interest margins would be reduced for the second six-month period if rates declined. Alternatively, if the 1-year investment were instead a 2-year investment, the bank's interest margins would be reduced for the second year if rates increased. (See Exhibit 2).

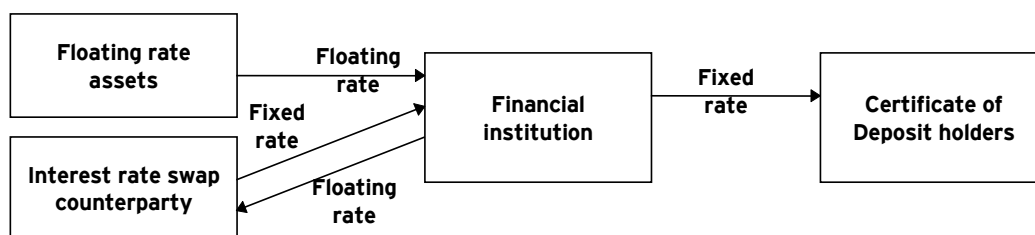
Illustration A-2: Natural hedge of fixed rate on certificates of deposit



There will be situations where management would like to hedge naturally but is unable to do so for a variety of reasons. Often, hedged exposures will change rapidly and management may have to adjust its assets or liabilities frequently to obtain the desired offsets. Additionally, there can be delays related to establishing these on-balance-sheet positions and the company may not be able to enter into the transactions timely enough to establish an effective "natural" hedge.

When a company cannot efficiently hedge its positions naturally, by modifying its cash flows or balance sheet position, management will often use derivatives to accomplish their objectives. Derivatives are often used to fine-tune risk exposures, because they are cost efficient to execute and can be tailored to achieve a desired result. Suppose the financial institution that issued certificates of deposit held floating rate assets (e.g., credit card loans indexed to the prime rate) instead of US Treasury notes and was therefore exposed to the risk of falling interest rates if it left this exposure unhedged. Management could sell its floating rate assets and purchase one year assets to hedge its fixed rate obligation but might find this uneconomical. As an alternative, the company could enter into an interest rate swap to accomplish a similar result. In this situation, the company wants to receive fixed rate earnings to meet its interest payment obligations to the holders of the certificates of deposit, so it enters into a pay floating rate and receive fixed rate swap. The fixed rate receipts related to the swap will offset the fixed rate outflows related to the certificate of deposit and the company will have hedged this exposure. If the fixed rate received on the swap is in excess of the rate paid to the certificate of deposit holders, the company will have locked in a "spread" or margin. (See Exhibit 3).

Illustration A-3: Hedge of fixed rate on certificates of deposit using interest rate swap



A.4 Does a company always want to hedge its exposures?

Management doesn't have to hedge its exposures; it can decide to retain a component of the natural exposure that is created by its operations. For example, the financial institution that naturally had one year liabilities and shorter term assets might want to retain its exposure to the variability of interest rates if management thought that rates were rising. If rates do rise, variable rate assets held by the company will generate additional returns while the rates paid to the holders of the certificates of deposit will not change. By opting not to hedge its exposure, management would be "taking a view" on the direction of interest rates.

Alternatively, management can also introduce an exposure by using a derivative. If the company had a naturally hedged position (e.g. a balance sheet with both fixed rate investments and fixed rate debt), management could enter into a pay fixed interest rate swap to create the same exposure as if it had floating rate assets. Special accounting is permitted for derivatives that qualify under certain hedging criteria.

Derivatives with no hedging purpose are recorded on the company's financial statements at fair value with changes in fair value reflected in current period earnings. One example is a company with no foreign currency exposures which takes a view that a given currency will lose value against the US dollar and enters into a forward transaction to sell a foreign currency for US dollars based on the current contract rate.

A.5 What are the most common hedged exposures and risks?

ASC 815 draws a distinction between hedged exposures and hedged risks. The Topic identifies the nature of exposures that may be designated as being hedged as follows:

- ▶ Exposure to changes in the fair value of a recognized asset or liability or unrecognized firm commitment that are attributable to a particular risk (see chapter 5),
- ▶ Exposure to variability in the cash flows of a recognized asset or liability or of a forecasted transaction that is attributable to a particular risk (see chapter 6), and
- ▶ Exposure to foreign currency variability related to net investments in foreign operations as well as three other specific situations (see chapter 7).

These categories address the nature of the exposure but not the risk that can be hedged. ASC 815 identifies several risks that companies are exposed to in the course of their activities, including interest rate, foreign exchange, market price, credit, liquidity, theft, weather, health, catastrophe, competitive and business cycle risks.

Through its definition of a derivative, the Topic addresses risks typically hedged with financial instruments while excluding other types of contracts. For example, traditional insurance products and contracts related to climatic, geographic or other physical variables are excluded from the Topic's scope. There will be a variety of products and strategies designed to protect companies from exposures related to the risks identified above; they just won't all be afforded hedge accounting treatment or be within the scope of the Topic.

Even if the Topic doesn't allow hedge accounting for a particular risk, or a given contract is scoped out of the Topic, there still may be valid exposures from which management may want to protect itself. For example, a company might have a significant exposure to a major hurricane in a given region. The company could protect itself against the exposure by purchasing an insurance product or a weather derivative. Either approach could insulate the company from the risks it faces. However, both casualty insurance contracts as well as a derivative that would compensate the company based on wind speed or severity of the hurricane are excluded from the scope of ASC 815.

A.6 What are the most common types of derivatives?

The following gives an overview of the most common types of derivatives. ASC 815 identifies derivatives through distinguishing characteristics rather than by listing specific contract-types. The characteristics must be applied to determine if the contract is a derivative as defined by ASC 815.

Contracts identified as over-the-counter are negotiated between two parties (typically an end user and an investment bank) and may be customized to address an end user's specific exposures. Over-the-counter contracts carry credit risk, as there is risk of non-performance under the contract by the counterparty to the transaction. Contracts identified as exchange-traded are generic contracts transacted through a regulated exchange. Exchange-traded contracts carry less credit risk and increased liquidity as compared with over-the-counter contracts; however, they cannot be specially tailored for specific situations.

Common derivatives include:

- ▶ *Forwards*: over-the-counter contracts to purchase or sell a specific quantity of a financial instrument, a commodity, or a foreign currency at a specified price determined at the outset, with delivery or settlement at a specified future date. Settlement is at maturity by actual delivery of the item specified in the contract, or by a net cash settlement.
- ▶ *Interest Rate Swaps and Forward Rate Agreements*: over-the-counter contracts to exchange cash flows as of a specified date or a series of specified dates based on an agreed-upon notional amount and agreed-upon fixed and floating rates.
- ▶ *Futures*: exchange-traded contracts similar to forwards. Futures settle in cash every day, via postings to the parties' margin accounts maintained at a futures broker. Futures are most commonly settled through an offsetting, "reversing" trade rather than by delivery of the underlying item or cash settlement.
- ▶ *Options*: over-the-counter and exchange-traded contracts that give the purchaser the right, but not the obligation, to buy (call option) or sell (put option) a specified quantity of a particular financial instrument, commodity, or foreign currency, at a specified price (strike price), during or at a specified period of time. The purchaser of the option will pay the seller (writer) of the option a premium to compensate the seller for the risk of payments under the option. Option premiums will vary depending on whether the option is "in the money" or "out of the money", the volatility of the underlying, and the time period over which the option can be exercised. An example of an "in the money" option would be a call option to buy a security for \$30 per share when it is currently trading at \$35. The option would be "in the money" by \$5 or have \$5 of intrinsic value. In addition to intrinsic value, options also have time value related to the volatility of the underlying and the time until the option's expiration. The more volatile the underlying and the greater the time period until expiration, the greater the likelihood that the option will wind up "in the money". There are two major types of options: 1) American style, which can be exercised at any date throughout the period of the option contract and 2) European, which can be exercised only at the expiration of the option contract. A collar transaction is a combination of a purchased option and a sold option; a company entering into a collar (e.g., selling a call and purchasing a put) will give up the upside gains related to the underlying in return for protection from downside losses.
- ▶ *Caps and Floors*: over-the-counter contracts often referred to as interest rate options. An interest rate cap will compensate the purchaser of the cap if interest rates rise above a predetermined rate (strike rate) while an interest rate floor will compensate the purchaser if rates fall below a predetermined rate.

There are many variations of the contracts described above, such as *swaptions*, which are options to enter into swaps, and *cancelable swaps*, which are swaps with embedded options that allow the holder to exit the swap contract in certain situations.

A.7 What are some common derivatives-related hedge strategies?

The following tables identify simple strategies companies use to hedge fair value and cash flow exposures related to interest rates, commodity prices, foreign exchange rates, and market prices.

A.7.1 Interest rate risk

Fair value

Fixed rate debt is the hedged item:

If the company has fixed rate debt and wishes to have variable interest expense or to be able to repay the debt without incurring a loss, it could use interest rate swaps to convert the fixed rate exposure on its debt to floating rate exposure. The interest rate swap used would require the company to pay the counterparty a floating rate in exchange for a fixed rate. The company would therefore substitute the floating rate paid to the swap counterparty for the fixed rate required to be paid to its debtholders.

Fixed rate asset is the hedged item:

If the company holds fixed rate assets (e.g., a US Treasury portfolio) and desires a floating rate of interest income or protection from declines in the value of the assets if interest rates increase, the company could enter into an interest rate swap where it pays a fixed rate and receives a floating rate. The company would therefore substitute the fixed receipts from the assets with its floating receipts from the swap and will thereby be protected from rising rates.

Cash flow

Floating rate debt is the hedged item:

If the company has floating rate debt, it is exposed to rising interest rates and could use interest rate swaps to convert this floating rate exposure on its debt to a fixed rate exposure. The interest rate swap used would require the company to pay the counterparty a fixed rate in exchange for a floating rate. The company would therefore substitute the fixed rate paid to the swap counterparty for the floating rate required to be paid to its debtholders.

Floating rate asset is the hedged item:

If the company holds floating rate assets (e.g., a floating rate loan portfolio) and desires a fixed rate of interest income, or protection from decreases in interest rates, the company could enter into an interest rate swap where it pays a floating rate and receives a fixed rate. The company would therefore substitute the floating receipts from the assets with its fixed receipts from the swap and will be thereby be protected from falling rates.

Anticipated issuance of fixed rate debt is the hedged item:

Management can use a contract known as a "treasury lock" which will "lock in" today's treasury rate for the period that the debt will be outstanding. Under the "treasury lock", the company will be compensated by the counterparty should the reference rate rise from the date of the "treasury lock" transaction through the date of the anticipated debt issuance and will compensate the counterparty to the extent that the reference rate falls.

A.7.2 Commodity price risk

Fair value

Fixed price commodity purchase contract is the hedged item (normal quantities for normal period):

The company has entered into contract with a supplier to purchase a required commodity at a fixed price. However the sales price of the finished good to be manufactured from the commodity will reflect changes in the value of the commodity. Therefore, the company could enter into a forward contract to sell the commodity at a predetermined fixed price at the delivery date.

Fixed price commodity sales contract is the hedged item (normal quantities for normal period):

The company has entered into a contract with a customer to sell commodities at fixed price on a future delivery date. Management may believe that prices are rising or that its cost to produce or purchase the commodity will fluctuate through the delivery date. The company could enter into a forward contract to purchase the commodity at a predetermined fixed price as of the delivery date.

Cash flow

Floating price commodity purchase contract is the hedged item (normal quantities for normal period):

The company has entered into a contract with a supplier to purchase a required commodity at the market price on the delivery date and wants to fix the price that it will pay. Management may believe prices will rise through the delivery date or that changes in the price of commodity cannot be passed through to its customers and wants to lock in its margins. The company could enter into a forward contract to purchase the commodity as of the delivery date at a predetermined fixed price.

Floating price commodity sales contract is the hedged item (normal quantities for normal period):

The company has entered into a contract with a customer to sell commodities at the market price on a future delivery date. Management may believe that prices are falling or that its cost to produce or purchase the commodity will be fixed through the delivery date. The company could enter into a forward contract to sell the commodity at a predetermined fixed price as of the delivery date.

A.7.3 Foreign currency risk

Fair value

Fixed price foreign currency denominated purchase contract is the hedged item:

The company has entered into a contract (a firm commitment) with a foreign supplier to purchase materials at a fixed price denominated in a foreign currency. Management may believe that the dollar will weaken through the period through the delivery date or that the company will not be able to pass on changes in the dollar cost of materials to its customers. The company could enter into a contract to buy the foreign currency forward on the delivery date at a fixed or contract price, effectively locking in today's exchange rate.

Cash flow

Anticipated transaction denominated in a foreign currency is the hedged item:

The company anticipates a purchase of supplies from a foreign supplier at an exchange rate to be determined as of the date of the purchase transaction. If foreign exchange rates rise through the period until the purchase date, the dollar denominated cost of the transaction will rise. The company could enter into a transaction to purchase the foreign currency forward on the anticipated purchase date at a fixed or contract price, effectively locking in today's exchange rate. The company would remain exposed to changes in the price of the supplies themselves, but not to the impact of currency fluctuations.

A.7.4 Risk of changing market prices of equity investments

Fair Value

The market price of equities held in a company's available for sale portfolio is the hedged item:

The company is concerned that the investments' market value will decline and could purchase put options that will set a floor price at which the company can sell the securities.

Cash Flow

Anticipated purchase of equity securities is the hedged item:

The company anticipates purchase of investment securities with proceeds from an upcoming debt issuance and could purchase call options that will establish a ceiling price for which the company can purchase the securities.

Note that some products (e.g., interest rate swaps and forward contracts) require the company to give up upside returns in return for protection from downside exposure. For example, increases in the value of fixed-rate financial assets resulting from declining interest rates will be offset by the decreases in the value of a pay fixed interest rate swap that was entered into to hedge exposure to rising rates. This type of hedge is called a symmetrical hedge, as gains on the hedged item are offset by losses on the derivative. Typically, derivatives that provide symmetrical returns have no value upon inception. The derivative will be priced at inception so that the expected value of positive cash flows will exactly match the expected value of negative cash flows. For example, the fixed rate of an interest rate swap is adjusted so that the net present value of fixed cash payments and the net present value of expected floating rate receipts net to zero at inception.

Other products allow the company to experience the upside related to the hedged item, while providing protection from downside exposures. For example, as discussed above, a company may buy a put option on equity securities that it holds in an available for sale portfolio. This put option would specify the strike price at which the company could sell the equity security to the counterparty to the option. If the price of the security rises, the company does not have to compensate the counterparty to the option for the increases in market prices. The counterparty was compensated by the option premium that it received upon inception of the option contract. Typically, derivatives that provide asymmetrical returns have a value upon inception related to the likelihood of cash receipts under the option.