

Getting a Grip on Accounting for Derivatives

A Guide for the Perplexed

Atlanta, Georgia

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Nature and Purpose

What is a *derivative*?

- An arrangement to receive or make payments based on prices related to a transaction without actually entering into that transaction.
- Example: interest-rate swap
 - \$10 million of outstanding bonds
 - Challenge: replace variable interest rate with fixed interest rate *without* refunding the outstanding debt
 - Current variable rate = 3.0%
 - Target fixed rate = 2.0%
 - Solution: contractual payments
 - Pay fixed rate/receive variable rate

Illustration

Payment on variable-rate debt (variable rate, currently 3%)	- \$300,000
Amount paid per contract (fixed rate of 2%)	- \$200,000
Amount received per contract (variable rate, currently 3%)	<u>+\$300,000</u>
Net payment	- \$200,000
Effective rate of interest (\$200K/\$10Million)	2%

- Why a *derivative*?

- Terms of contractual payments *derived* from a transaction that is *not* part of the contract

- Payments are *equivalent* to interest payments on \$10 million of debt

- Not actual interest payments

What are the defining characteristics of a derivative?

■ Settlement factors

- Reference rate (price or index) +
- Notional amount/Payment provision

■ Leverage

- Little or no net investment produces effects normally requiring a much larger investment

■ Net settlement

- No need to actually surrender an asset equivalent in value to the notional amount

What can be used as a *reference rate*?

- *Observable* or otherwise *objectively verifiable*
 - A security price or security price index,
 - A commodity price or commodity price index,
 - An interest rate or interest rate index,
 - A credit rating or credit index,
 - An exchange rate or exchange rate index,
 - An insurance index or catastrophe loss index, or
 - A climatic or geological condition (e.g., earthquake severity, rainfall), another physical variable, or a related index.

How are derivatives used in practice?

- To generate income (investments)
- To reduce the potential volatility associated with changes in either
 - the fair value of assets or liabilities, or
 - changes in related cash flows

How can derivatives reduce volatility?

- Change in
 - Fair value (Δ market price of investment)
 - Cash flows (Δ interest on variable-rate debt)
- Hedging
 - Asset/liability (*hedged item*) +
 - Arrangement intended to offset potential change (*hedging derivative*)
- Illustration – interest-rate swap

How should a derivative be reported?

- Economic resources/accrual
 - Derivative *always* reported at fair value
 - Change in fair value *normally* reported in period of change
 - Reflected in statement of resource flows
- Current financial resources/modified accrual
 - Not reported, as such

When are changes in fair value *not* reported in the period?

■ Background

- Fair value of hedging derivative and fair value of hedged item typically move in *opposite* directions
- Illustration (put option on investment security
 - strike price = \$100)
 - No initial net investment
 - Subsequent decrease in fair value of hedged investment security (from \$100 to \$97)

Illustration

	<u>DR</u>	<u>CR</u>
Derivative	\$3	
Investment income		\$3
(To record increase in fair value of derivative)		
Investment income	\$3	
Investments		\$3
(To record decrease in fair value of investments)		

- Challenge arises if hedged item is *not* reported at fair value
- Illustration
 - \$100 variable-rate debt
 - Interest-rate swap (no net investment)
 - Interest rates increase
 - Fair value of debt increases to \$103
 - Fair value of swap increases to \$3

Illustration

	<u>DR</u>	<u>CR</u>
Derivative	\$3	
Investment income		\$3

(To record increase in fair value of derivative)

- Does *not* reflect economic substance of hedge
- Solution: “hedge accounting”
 - Defer recognition of changes in fair value of derivative
 - Report as deferred inflows/outflows on the statement of position

Illustration

	<u>DR</u>	<u>CR</u>
Derivative	\$3	
Deferred inflow		\$3

(To record increase in fair value of derivative)

What happens to the deferred amounts?

■ Termination events

- The hedge anticipates an actual future event that is no longer considered to be probable
- The hedged item is sold or retired
- The hedging instrument is terminated
- The hedged item is debt and that debt is defeased
- The hedge anticipates an actual future event that finally occurs

- Normal treatment
 - Adjustment to investment income
- Special situations
 - Commodities contracts
 - Adjustment to purchase price of commodities
 - Refundings
 - Adjustment to net carrying value of refunded debt
 - Financial instruments not reexposed to risk
 - Amortize over life of successor instrument

Do all hedges qualify for hedge accounting?

- Three criteria must be met
 - Hedged item reported at *fair value*
 - Hedged and hedging items *clearly associated*
 - Notional amount of hedging item consistent with principal amount or quantity of hedged item
 - The hedging and hedged items are both reported in same fund
 - Periods are consistent
 - Hedge is *effective* (successful at achieving goal)

How does a government determine whether a hedge is effective?

- Consistent critical terms method
- Quantitative method

How does the *consistent critical terms method* work?

■ Illustration:

- \$10 million in variable-rate debt
- Interest-rate swap:
 - The variable-rate debt uses Index A
 - Currently 3.0%
 - The swap contract uses Index A as well for the counterparty's variable-rate payments
 - The swap contract calls for the government to make fixed-rate payments at 2.0%

Illustration

Payment on variable-rate debt (3%)	- \$300,000
Amount received per contract (3%)	+\$300,000
Amount paid per contract (2%)	<u>- \$200,000</u>
Net payment	- \$200,000
Effective rate of interest (\$200K/\$10Million)	2%

- Terms are *consistent* because they provide *structural assurance* of effectiveness
 - Payments to bondholders will always equal payments from swap contract
 - Net effect = fixed interest rate of 2.0%

What quantitative methods can a government use to determine whether a hedge is effective?

- Three basic methods
 - The synthetic instrument method,
 - The dollar offset method, and
 - Regression analysis.
- Other quantitative methods if they:
 - Demonstrate that changes in the hedged item are substantially offset by changes in the hedging item
 - Are replicable
 - Give proper consideration to all substantive characteristics that could affect changes.

How does the *synthetic instrument method* work?

- In an effective hedging arrangement, the hedging item and the hedged item are so closely matched that they function together, for all practical purposes, as a single synthetic (i.e., combined) instrument.
- Is the synthetic instrument successful at achieving its goal?
 - Divide actual results by target
 - Must fall within a range between 90% and 111%

Illustration

■ Assumptions

- Same interest-rate swap described earlier, but with different indices
 - Government's variable-rate debt
 - Index A - currently 3.0%
 - Counterparty's variable-rate contractual payments
 - Index B - currently 2.7%
- *Not* consistent critical terms
 - Different indices will not automatically be in sync

Illustration (cont.)

Payment on variable-rate debt (3%)	- \$300,000
Amount received per swap (2.7%)	+ \$270,000
Amount paid per swap (2%)	<u>- \$200,000</u>
Net payment	- \$230,000
Effective rate of interest (\$230K/\$10Million)	2.3 percent

Illustration (cont.)

- 2.3% actual/2.0% target = 115%
 - Ineffective
 - Outside of 90% to 111% range

How does the *dollar offset method* work?

- Compares dollar amount of
 - Δ hedging item (e.g., \$120)
 - Δ hedged item (e.g., \$100)
- Effective if proportionate change falls within a range of 80% to 125%
 - $\$120/\$100 = 120\%$ ($<125\%$ = effective)
 - $\$100/\$120 = 80\%$ ($\geq 80\%$ = effective)

What results must be achieved using *regression analysis* to qualify as an effective hedge?

- The R-squared $\geq .80$
- The F-statistic demonstrates significance using a 95% confidence interval
- The regression coefficient for the slope falls between -1.25 and -0.80.

Are there any limitations on the choice of method?

- Normally free to consider a hedge effective if it qualifies using any of these methods
- Normally free to consider a hedge ineffective if it fails using any of these methods.
 - Exception: a potential hedge cannot *initially* be disqualified solely because it does not qualify using the consistent critical terms method

What happens if a hedge is determined to be ineffective?

- Termination event
 - Any related balance of deferred inflows/outflows must be eliminated
 - Adjustment to investment income.

What is an *embedded derivative*?

- A provision of a contract that would qualify as a derivative if it were separate from the contract
 - A call option built into a bond contract

How should embedded derivatives be treated?

- Economic characteristics closely related to the object of the contract?
 - Embedded derivative treated as an integral part of the contract
- Economic characteristics *not* closely related
 - Report separately (hybrid accounting), but only if the associated item is *not* reported at fair value

Are any potential derivatives excluded from the scope of this guidance?

- Normal purchases and sales contracts.
- Nonexchange-traded contracts
 - Physical variable or
 - Price or value of a nonfinancial asset
- Insurance contracts.
- Financial guarantee contracts
- Loan commitments