Hypothetically Speaking

Accounting for commodity hedges

Ira Kawaller
American companies that hedge commodity purchases and sales almost always suffer from basis risk—the risk that changes in cash prices paid or received for commodities being hedged will differ from the price changes that underlie hedging derivatives.

This risk arises because, typically, available derivative contracts reference some “industry standard” commodity price, where the quality of that reference asset and/or its delivery location differ from the firm-specific price risk being hedged. For well-functioning hedges, these two respective prices need not be identical, but they should be highly correlated.

Many companies understand basis risk and are prepared to accept it. They’re comfortable substituting the risk of changes in the basis for the broader, market risk that they associate with the industry standard commodity price changes. Put another way, companies often tend to view their cash price exposure as being composed of an industry standard price risk coupled with a basis risk. The derivative is expected to hedge the lion’s share of that combined risk.

Unfortunately, in the United States, the accounting authorities have a different orientation. Under U.S. GAAP, cash flow hedge accounting is generally the preferred accounting

**KEY INSIGHTS:**

- To qualify for hedge accounting, derivative gains or losses must be highly effective in offsetting the full cash price changes of the purchases or sales being hedged—not just the “industry standard” price change.
- The “hypothetical derivative” is a conceptual construct that would generate a perfect hedge offset.
- Ineffective earnings are recognized in earnings only when cumulative gains (or losses) from the actual derivative exceed those that would have been generated by the hypothetical derivative.
Hedging

treatment relating to hedges of prospective purchases or sales. This treatment reflects the intended economics of the hedge by deferring the earnings recognition of the effective portion of a hedging derivative's results until earnings are recognized for the purchases or sales being hedged.

In order to qualify for hedge accounting treatment, the hedging entity must expect the derivative to be “highly effective” in offsetting the risk being hedged. Ineffectiveness derives from a comparison of the derivative’s gains or losses to the losses or gains associated with the full cash price change of the commodity being hedged—not just the industry standard price change. When these two prices move differently, the hedge either under-performs or over-performs relative to the cash price risk being hedged. If the imbalance is sufficiently large, then hedge accounting could be disallowed.

Defining hypothetical derivatives

To determine the appropriate division between effective versus ineffective hedge results, many companies rely on the concept of a hypothetical derivative—a derivative that, if it could be traded, would perfectly offset the risk being hedged. Ideally then, commodity hedgers would likely seek to execute a perfectly tailored hedging derivative that expressly referenced that firm’s specific cash prices. Typically, however, most derivative dealers wouldn’t be willing to trade such a contract. Rather, they’d offer contracts that reference an industry standard price. The perfect hedge, then, is not one that generally can be traded. It is commonly referred to as the hypothetical derivative, and its settlement amounts are thus… hypothetical.

In any case, the results that would have been generated by trading a hypothetical derivative may be compared to those of the derivative that is actually traded (i.e., the actual derivative) to generate the measure of hedge ineffectiveness needed to properly satisfy the accounting requirements. More specifically, this comparison requires an assessment of cumulative gains or losses, and ineffectiveness fosters an earnings impact only if the actual derivative over-performs relative to the hypothetical. That is, ineffective earnings are recognized in earnings only when actual gains (or losses) exceed hypothetical gains (or losses).

In the typical case, hypothetical derivatives will follow the same form as their associated actual derivatives. For example, if the actual derivative is a forward contract, the hypothetical contract would also be a forward contract. If the actual is an option contract, then the hypothetical would be an option. If the actual is a swap, then the hypothetical would be a swap. In each case, though, beyond knowing the type of instrument, we also need to define that instrument’s critical features—forward (or futures) prices for hypothetical forwards (or futures), strike prices for hypothetical options, or fixed prices for hypothetical swaps. These critical features can be deduced by applying a transforming equation to the associated feature(s) of the related actual derivative. The precise methodology for making these transformations, however, is left to the discretion of those doing the hedging.

While no unique methodology for making these transformations is prescribed by generally accepted accounting principles (GAAP), the terms of the hypothetical derivative should be documented up front. Otherwise, the discipline to assure that the accounting treatment is not being manipulated would be lost. How, then, do we devise this transformation? Ultimately, the transformation should reflect the nature of the relationship between the cash prices of the hedged item and the prices of the industry standard commodity underlying the hedging derivative.

One solution is to apply regression analysis, where we’d strive to discern a linear relationship between the cash price being hedged (C) and the price that underlies the hedging derivative (D):

\[ C = a \times D + b \]

where estimates for the values for the slope (a) and intercept (b) would be estimated by the regression analysis.

Assuming this equation is a valid representation of the relationship between these two variables, we apply this equation to transform the features of the actual derivative to get the associated parameters for the hypothetical derivative.

For example, suppose the actual derivative is a commodity swap with a fixed price of $4.50 per unit. The resulting regression equation is \( C = 0.9 \times D + 0.25 \). Plugging the swap’s $4.50 fixed price as the D value in the regression equation yields a price of $4.30 (\( =0.9 \times 4.50 + 0.25 \)), which would be the presumed fixed price for the hypothetical derivative.

Alternatively, if the hedging derivative happened to be an option with a strike price of $4.50, that same approach would dictate that the strike price on the hypothetical option should be $4.30. Clearly, any result would be dependent on the data set used for the analysis.
Hypothetical case

A second approach for setting the critical terms of the hypothetical derivative would be to adjust the actual derivative’s critical price by some spread or differential. To illustrate, consider the case where a company’s basis ranged from a low of $0.05 to a high of $0.40. With this history, it would seem reasonable to set the transforming spread somewhere between these extremes. Any number of methods could be used, however, to determine this mid-range value. For instance, the company might simply set the spread to the mean of the basis over the latest two or three years, or the median, or some other alternative weighting scheme of past basis values.

Under both methodologies, the objective is to define a hypothetical derivative that reflects an outcome that we expect to be able to realize. Importantly, this objective is only a target; it’s not something that we can necessarily achieve. In other words, if we define a fixed rate for the hypothetical swap to be, say, $4.30, we should expect the hedge (using an actual swap having a fixed rate of $4.50) to end up locking in an all-in fixed price of (about) $4.30. Similarly, if the strike price on a hypothetical cap is $4.30, we should expect to end up constraining our all-in purchase prices to no more than (also roughly) $4.30.

It should be clear that different entities will end up defining different hypothetical derivatives for situations where their actual derivatives are identical. As a consequence, those two entities, having identical derivative outcomes (for their actual derivatives) may very well end up with different measures of ineffectiveness, and thus different earnings results and different AOCI values. Put another way, GAAP as currently written does not foster a unique accounting result for companies using the same derivative, hedging the same risk.

That said, it’s important to realize that, ultimately, it is the earnings impact from the actual derivative that will be realized in earnings. That amount is unaffected by the design of the hypothetical derivative. The hypothetical instrument might likely impact the timing of when actual gains and losses generated by the actual derivative are recognized in earnings, but not the amount.

By whatever method selected, once the terms of the hypothetical derivative have been set, subsequent valuations for these hypothetical derivatives would likely be found by repeating the transformation technique to generate subsequent hypothetical forward prices, as time goes by. At each quarter-end, either an updated regression would be performed, or an updated spread would be calculated. These revised results would then be used to transform the (observable) forward prices of the actual derivative to (unobservable) forward prices for the hypothetical derivative. Those transformed forward prices would serve as the critical inputs for (re)valuing the hypothetical derivative. Regardless of the methodology chosen, when devising the hypothetical derivative’s new forward prices, it would be reasonable and appropriate to apply the same conventions as far as observations and frequencies used in connection with the way the critical terms of the hypothetical derivative were devised. In that way, the methodology will reflect any changes in the relationship between the cash prices and the prices underlying the derivative, as those changes become apparent.

The good news is that the accounting guidance offers considerable flexibility to hedging entities, allowing hedgers to devise hypothetical derivatives in a manner that seems most workable. The bad news is that this flexibility translates to a lack of consistency. Different companies hedging virtually the same risks with the same derivatives may end up with dramatically different earnings representations. This lack of consistency is inherent in any hedging application that relies on the use of hypothetical derivatives, but it is especially severe in commodity hedging situations due to the requirement that hedgers must seek to address their entire price risk, inclusive of basis risk.

It’s important to realize that, ultimately, it is the earnings impact from the actual derivative that will be realized in earnings.

Ira Kawaller is the founder of Kawaller & Co., a consulting organization that assists commercial enterprises in their use of derivative instruments.