# Futures versus Forwards: Implications of FAS 133

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Financial professionals generally understand that 1) futures contracts and forward contracts may be used for similar purposes, and 2) accounting for both is dictated by the new hedge accounting rules under the Financial Accounting Standard No. 133 (FAS 133). Few, however, fully appreciate that this standard will likely affect *how* these tools are used. In fact, implementation of FAS 133 will change risk management practices, but with different consequences for these two similar instruments.

## DISTINGUISHING FEATURES OF FUTURES AND FORWARD CONTRACTS

A forward contract is a principal-to-principal transaction that commits the counterparties to exchange some underlying property at a given price on some agreed-upon, forthcoming exchange date or value date. As such, forward contracts may be viewed as price-fixing mechanisms. A producer or supplier could *sell* a forward contract to lock in a prospective sale price; a consumer could *buy* a forward contract to lock in a prospective purchase price. In both cases, the forward price eliminates the risk of an adverse price change and the opportunity of a beneficial price change.

With forwards, all features of the trade are negotiable. In particular, the underlying property per se, the forward price, and the timing of the prospective value date are all determined by the consent of the parties to the contract.

Futures contracts serve the same economic purpose, but they do so with some rather unique institutional features. First, futures are traded on an exchange, so that parties to a trade are essentially indifferent to the original counterparty to the transaction. Second, futures are available only for a select set of underlying instruments. That is, you can't trade a futures contract on just *anything*. You are limited to the specific futures listed by existing futures exchanges.

Fortunately, in today's world, available contracts cover substantial numbers of hard and soft commodities and a significant number of "benchmark" financial products, including all the major foreign currencies and key interest rates and stock indexes. Examples are U.S. Treasury rates, the London Interbank Offer Rate (LIBOR), and the S&P 500 index.

Besides being limited to a given set of underlying instruments, futures contacts are also standardized in terms of a fixed size and a specific value date(s), which are dictated by the contract. For instance, a futures contract on British pounds allows traders to lock in the price (i.e., exchange rate) on 62,500 British pounds per contract, with the value date of the third Wednesday of the contract month. The eurodollar contract pertains to three-month LIBOR on a $1 million three-month eurodollar deposit, with the deposit starting, again, on the third Wednesday of the contract month.

Beyond the fact that futures are standardized and traded on an exchange, their most significant feature is that they are marked to market on a daily basis, and these daily price changes are settled in cash. Essentially, the exchange bears the responsibility of collecting from the losers and paying the winners every day. The capacity to do so is protected by the fact that both parties to a futures trade must put up collateral or a performance bond (also called *initial margin* or *original margin*) before the futures trade can be initiated.

## HEDGE RESULTS

This mark-to-market feature means that gains and losses on futures are realized immediately after they occur — that is, the next day. In contrast, gains or losses on forwards are not realized until the value date becomes current.

For example, consider the case of a U.S. importer who, in January, decides to fix the price of British pounds for a transaction planned in mid-September. For simplicity, assume that the expected value date coincides with the futures delivery date (value date), so that the relevant futures price and the alternative forward price would likely be the same. Also assume that the amount of British pounds is neatly divisible by the size of the futures contract, so that the futures hedge can be implemented with no rounding error. For simplicity, assume this exposure to be £6.25 million (i.e., equivalent to 100 futures contracts).

We consider two cases. In the first, the hedger buys a forward contract on £6.25 million British pounds. In the second, the hedger buys 100 futures contracts. In both cases, assume the initial price at the inception of the hedge is \$1.6500/£ and that at the end of the first quarter, both the futures price and the forward price change by \$0.1000/£, rising to \$1.7500/£.

Critically, the gain on the futures is \$625,000 (= \$0.1000/£ × £62,500 per contracts × 100 contracts), but that's not true for the forward. The gain on the forward contract is the *present value of* \$625,000, which is necessarily a smaller amount. Similarly, if the forward/futures price were to fall by \$0.1000/£, the loss on the futures position would be \$625,000, while the loss on the forward would be the smaller amount, the present value of \$625,000.

Thus, one cannot make the argument that either futures or forwards are systematically superior. When the pound is strengthening, the futures hedge would be preferred; when the pound is weakening, forwards would be preferred. These preferences would be reversed, however, for firms operating with the opposite risk exposure (e.g., a U.S. exporter who contracted to sell in British pounds, rather than in U.S. dollars).

## TAILING A FUTURES HEDGE

There is a way to equalize the two results, however, and the process is called "tailing" the futures hedge. Essentially, the hedger must adjust the size of the futures hedge by a present value factor. Unfortunately, the process is complicated by the fact that the correct present value factor is not known with certainty at the initiation of the hedge. That is, in January, the hedger must "guess" what the present value factor will be as of March 31, i.e., what the interbank interest rate on dollars will be for the period from March 31 through the value date in September.

Mathematically, assuming the time to the relevant value date is less than one year, this present value factor (F) is found as follows:

$$F = \frac{1}{\left(1 + r\frac{d}{360}\right)} \qquad (1)$$

where F = the present value factor; r = the interbank interest rate (expressed as a money market yield);[1] and d = the days between the end of the quarter and the value date.

If the time to the value date were longer than a year, the factor would be found using a different equation:

$$F = \frac{1}{(1 + i / c)^n} \qquad (2)$$

where i = the bond-equivalent yield associated with the time to the value date; c = the compounding frequency of the bond-equivalent yield; and n = the number of compounding periods to the value date.

However figured, the appropriate number of futures contracts that would generate (approximately) the same gain or loss as the forward contract would be the factor F times the notional number of currency units being hedged, divided by the size of the futures contract (i.e., currency units per contract). With the completion of each quarter, a new factor would have to be calculated for the next quarter. The hedge would have to be adjusted, and the process repeated until the hedge value date finally arrived.

Beyond these adjustments, at the end of each quarter any gain on the futures hedge realized during the accounting period would have to be invested, or, alternatively, any loss would have to be funded. In either case, the horizon for the investment/funding would be the time remaining until the hedge value date. This incremental income/expense is critical, as it corresponds (roughly) to the change in value of a forward contract that arises from the gradual adjustment of the present value factor to unity as the hedge value date approaches.

The rationale for this incremental investment/funding activity becomes transparent if one considers the consequence of omitting this step. Suppose, for example, that the pound were to strengthen sharply immediately after the imposition of the hedge, and then remain at this higher level until just before the hedge value date, when it would return to its original value of $1.65000. In this case, the forward contract hedge would yield no gain or loss, since it started and ended at the same value.

The futures hedge, on the other hand, would generate a gain with a fewer number of contracts and a loss with a larger number of contracts. Overall, then, the futures hedge produces a loss. Conceptually, the gain from investing the early gains is designed to offset the aggregate futures loss, thus making the futures hedge economically equivalent to the forward hedge.

## ACCOUNTING CONSIDERATIONS

While economically equivalent, the accounting consequences of the alternative hedges will not necessarily be identical. To understand the differences, it is necessary to distinguish between fair value hedges and cash flow hedges as defined by the FASB.

In a *fair value hedge*, the risk exposure is associated with the price of an asset, liability, or firm commitment, where any prospective cash flows are known with certainty. When hedging such exposures, the derivative must be marked to market, with the resulting gains or losses recorded in earnings. In addition, the underlying exposure from the risk being hedged must also be marked to market, and these results must flow through current income as well. To the extent that the two contributions to earnings are offsetting, the hedge will not have an impact on current earnings. Imbalances between the two, on the other hand, will impact earnings.

*Cash flow hedge* accounting is appropriate when the exposure pertains to an upcoming, forecasted event, whereby the prospective cash payment (receipt) is an uncertain amount. Accounting for cash flow hedges requires that derivative results be evaluated, and a determination made as to how much of the result is "effective" and how much is "ineffective." The ineffective component of the hedge results must be realized in current income, while the effective portion is originally posted to "other comprehensive income," and later reclassified as income in the same time frame in which the forecasted cash flow affects earnings.[2]

### Fair Value Hedges

With respect to fair value hedges, aside from discrepancies that would arise from a difference between the forward value date and the futures value date, or differences associated with rounding error, a properly tailed futures hedge should generate approximately the same contribution to earnings as that of a forward hedge. This conclusion, however, requires that the incremental gain or loss from the investment/funding of the futures results be "counted" as part of the hedge performance.

To the extent that the entity fails to make investment and/or funding transactions that are explicitly recognized as being tied to the hedging activity, overall hedge results may appear to be different for the two alternative hedges. That is, gains and losses of the futures will be different from those of the forwards.

In many cases, hedgers ignore tailing and the explicit, related incremental investment/funding transactions. This choice has a somewhat perverse consequence. In the short run (i.e., during any accounting period except the final one), the futures result from an untailed hedge will be larger than the alternative forward result. Over time, however, assuming the hedge ratio remains unchanged over the hedging period, the nominal gains or losses of futures will be identical to those of a forward hedge. Returning to the earlier currency example, for example, if the exchange rate for British pounds were to change from $1.6500/£ to $1.7500/£ over the life of the hedge, the nominal gain for both the futures hedge and the forward hedge would be the same: $0.1000/£.

### Cash Flow Hedges

To understand cash flow hedges, consider the case in which the forward contract is completely effective.[3] If the tailed futures hedge generates an identical gain or loss — inclusive of the incremental investment/funding effects — the accounting would differ because FAS 133 does not

authorize the incremental gains or losses to be recognized as part of the hedge results. Instead, assuming the investment/funding is associated with explicit transactions, these results would be treated as ordinary income or expense and therefore would be recognized in earnings. Only the pure futures component of the hedge gains would (potentially) be realized in other comprehensive income, assuming these results were deemed to be effective.

This outcome, however, is not automatic. It depends on the specific method that the entity says it will use to assess effectiveness. Even if the entity can articulate an effectiveness testing method that allows *all* the futures results to be allocated to OCI, over time the contribution to OCI from a futures hedge would not be the same as the contribution from a forward hedge.[4] Thus, the two strategies generate different schedules for reclassification to earnings under the two alternatives.

As with fair value hedges, many entities may elect to ignore tailing in connection with cash flow hedges too. The same short-run/long-run dichotomy exists for untailed cash flow hedges as for untailed fair value hedges. That is, in the short run, an untailed futures hedge will generate a larger result than the forward alternative, but ultimately, the reclassifications from OCI to earnings will be identical for futures and forward hedges.[5]

## CONCLUSIONS

In using futures contracts to hedge, the critical question is: "Should the hedge be tailed or untailed?" And the answer is...it depends.

Tailed hedges should probably be favored for fair value hedges. Because the offsetting basis adjustment to the hedged item will be the change in the value of this item — that is, the change in the present value — due to the risk being hedged, tailed hedges tend to offer a closer offset than untailed hedges. Thus, the tailed hedge would probably generate a smaller degree of income volatility.

For cash flow hedges, the preference is less clear. There is little question that the tailed hedge is the more perfect economic solution. To the extent that the unhedged exposure would otherwise affect earnings in a prospective time bracket, the correct economic solution should generate an amount that approximates the present value of the prospective change in the exposure. This result, in fact, is what a tailed hedge is designed to do. But given that the accounting rules only allow the realized gain or loss from the derivative to be allocated to other comprehensive income, the consequence of tailing will be that, upon reclassification to earnings, hedge results will appear to be underhedged. An untailed hedge, on the other hand, will generate the seemingly attractive accounting upon reclassification, albeit with a realized outcome that is larger than the optimal economic solution.

Regardless of which hedge is considered, it's likely that the size of the relevant present value factor will be the ultimate determinant of whether to use a tailed or an untailed hedge. Assuming this factor is close to unity — i.e., the relevant hedge value date is not too far off — the difference between the tailed hedge and the untailed hedge will be small. Staying with an untailed hedge and avoiding the more cumbersome processing of a tailed hedge is probably how most hedgers will choose to operate. On the other hand, when the present value factors differ substantially from unity, hedgers will tend to choose the tailed hedge. Exactly where the critical dividing line is for this present value factor will have to be determined on a case-by-case basis.

## ENDNOTES

[1]For futures contracts other than currencies, a more appropriate interest rate would be one that reflects the average of the firm's cost of capital and the rate it would earn on its investments. The former would be relevant in cases when the futures contracts generate losses, while the latter would be appropriate when the futures contracts generate gains. Unfortunately, not knowing which direction the market will move, hedgers will likely base their calculation of the present value factor on some intermediate rate — probably the average of the two preferred alternatives.

[2]FASB only recognizes hedges as being ineffective for accounting purposes when the hedge effects exceed the effects of the underlying forecasted cash flow, measured on a cumulative basis.

[3]This result is typical of the case in which the forward explicitly relates to the risk exposure (i.e., having the same underlying instrument with no quality or location differences, and having a value date precisely equal to the date of the forecasted transaction).

[4]Recall that the mark-to-market value of the forward will change, in part because of ongoing adjustments to the present value factor. No analogous gain or loss is generated with a tailed futures hedge.

[5]This conclusion rests on the assumption that effectiveness is measured by comparing the futures result to the projected gain or loss of the perfect forward, as of the forecasted value date.