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**Testing Hedge Effectiveness Under SFAS 133**

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**by**

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## TESTING HEDGE EFFECTIVENESS UNDER SFAS 133

### I. Introduction

The FASB issued SFAS 133, *Accounting for Derivative Instruments and Hedging Activities*, because the quantity and variety of derivatives owned by firms have increased rapidly and the effects of the derivatives were not transparent in the financial statements. SFAS 133 standardizes the accounting treatment for derivative instruments by requiring all entities to report their derivatives as assets and liabilities on the balance sheet and to measure them at fair value (paragraph 3). This change is a step toward the FASB's objective of having all financial instruments measured and reported at fair value.

SFAF 133 recognizes three categories of hedges, fair value, cash flow, and foreign currency hedges. A fair value hedge offsets the price risk of a recognized asset or liability or an unrecognized firm commitment. A cash flow hedge offsets the variability of the cash flow of a balance sheet item or a forecast transaction. FASB describes foreign currency hedges separately, even though the majority are fair value or cash flow hedges, to preserve the hedging concepts embedded in SFAS 52.

If a derivative qualifies as a "highly effective" hedge (paragraphs 3, 20, and 28), SFAS 133 permits firms to match the timing of the gains and losses of hedged items and their hedging derivatives. For a fair value hedge, SFAS 133 permits the hedger to record the change in the fair value of the hedged item concurrently with the gain or loss on the hedging derivative (paragraph 22). In the case of a cash flow hedge, the effective portion of any changes in the hedging derivative's fair value is recorded in other comprehensive income until the change in the value of the hedged item is recognized in earnings (paragraph 30). If a derivative does not qualify as a hedge, its changes in value must be reported in quarterly earnings.

In principle, a hedge is highly effective if the changes in fair value or cash flow of the hedged item and the hedging derivative offset each other to a significant extent. To permit as precise matching as possible, the hedged item can be any portion of a balance sheet item, firm commitment, or forecast transaction; the hedge position can be any portion of a derivative. Similarly, the hedger can exclude from the hedge calculations anticipated changes in values that are not part of the risk being hedged. For example, if a derivative is priced at a discount to the current spot price and is expected to appreciate toward the current spot price as the derivative approached expiration, the firm can account separately for that expected appreciation.

To qualify a derivative position for hedge accounting, the hedging entity must specify the hedged item, identify the hedging strategy and the derivative, and document by statistical or other means the basis for expecting the hedge to be ‘highly effective’ in offsetting the designated risk exposure. The documentation step is called *prospective testing*, and it must be done before entering into the hedge, and on an ongoing basis, to justify continuing hedge accounting. The hedger must also regularly perform *retrospective testing* to determine how effective the hedging relationship has been in actually achieving offsetting fair values or cash flows. Unless a specific exception applies,<sup>1</sup> Section 2 of Appendix A of SFAS 133 requires the use of statistical or other numerical tests to demonstrate that a hedge is “highly effective” and thus qualifies for hedge accounting under SFAS 133. SFAS 133 does not endorse any specific testing methodology. The hedger must select the methodology, choose the measurement period and observation frequency, and specify an appropriate test statistic.

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<sup>1</sup> An entity need not perform a detailed analysis of hedge effectiveness when the critical terms of the hedging derivative and the hedged item are the same because the hedger can reasonably expect complete offset of the risk being hedged (SFAS 133, paragraph 65, and DIG Issue G9). See also the discussion of the ‘shortcut method’ that is available for interest-rate swaps and recognized interest-bearing assets or liabilities, SFAS 133, paragraphs 68-70, 114, and 132, and DIG Issues E4, E10, E12, E14, E15, and E16.

Defining and testing a measure of hedge effectiveness are important and potentially challenging aspects of hedge accounting. Failure to execute these aspects well may introduce substantial volatility in reported earnings. In this article we describe and illustrate the process of qualifying a derivative for hedge accounting. We identify challenges that firms confront and choices that firms must make when testing hedge effectiveness. These descriptions and illustrations reflect our best understanding of this subject. We cannot, of course, make any representation as to the acceptability of any of these tests to a hedger's auditors.

## **II. What is a Highly Effective Hedge?**

One response to this question is that “a highly effective hedge substantially offsets the change in the fair value (or the cash flow) of the hedged item”: If the hedged item in a fair value hedge appreciates by \$100,000 then there is some range of decline in values of the hedge that we can define as substantially offsetting this change. Defining this range is a matter of subjective judgment. Suppose that we agreed that a highly effective hedge would offset at least 80% of this change and no more than 125%. Then the acceptable range of the change in value for the derivative would be between  $-\$80,000$  and  $-\$125,000$ . This method of testing for effectiveness has the additional merit that it leads directly to the accounting treatment of the change in value of the derivative. To the extent that the sum of the changes in values is not zero, there is an element of ineffectiveness in the hedge and it is included in current income (SFAS 133 paragraphs 22 and 30). Thus, even when a hedge is determined to be highly effective, there is an impact on current earnings when there is not an exact offset of the hedged risk. If, for example, the change in value of the derivative were  $-\$110,000$ , then the hedge would be highly effective because this change in value falls within the specified range and hedge accounting would report an effect on income

of  $+\$100,000 - \$110,000 = -\$10,000$ .<sup>2</sup> This idea of offsetting has found its way into the hedge effectiveness testing literature in the form of the Dollar-Offset Method of testing, which we later discuss in detail.

A second response to this question is that “a highly effective hedge substantially offsets risk associated with the change in the fair value (or the cash flow) of the hedged item”. A widely accepted measure of risk is variance. In his seminal paper Ederington (1979) advocated variance reduction as a measure of hedging effectiveness. Estimating variances requires multiple observations. To extend the example above, suppose that over 4 quarters the changes in fair value of the hedged item were  $[\$100,000, \$40,000, -\$120,000, \$5,000]$ , and the corresponding changes in the fair value of the derivative were  $[-\$110,000, -\$35,000, +\$128,000, -\$8,000]$ . The recorded hedged income effects would be  $[-10,000, +\$5,000, +\$5,000, -\$3,000]$ . The variance without hedging is 8.623 billion (dollars squared) and the variance of the income stream with hedging is 0.07 billion (dollars squared). Hedging eliminated 99% of all of the variance of income that the unhedged item would have created. The variance measure of effectiveness, 99%, formalizes what most would readily recognize, the hedge eliminated most of the risk.

### **III. Methods of Testing Hedge Effectiveness**

In this article we describe and illustrate three methods of testing the hedging effectiveness of forwards, futures and swaps, when the critical terms of the hedging derivative and the hedged item are not identical:<sup>3</sup> (1) the Dollar-Offset Method, (2) the Variability-

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<sup>2</sup> The accounting for cash flow hedges is more complex because changes in the derivative are accumulated in Other Comprehensive Income.

<sup>3</sup> We do not evaluate the hedge effectiveness of options. Testing option hedge effectiveness is more complex because the hedge can be either dynamic or static and you can test using the option's market value, intrinsic value or minimum value (SFAS 133, paragraph 63).

Reduction Method, and (3) the Regression Method. We illustrate each description with detailed calculations using an example from practice.

### 1. Dollar-Offset Method

The Dollar-Offset Method, which has some historical significance for the accounting profession (Kawaller and Koch, 2000, and DIG Issue E7), compares the changes in the fair value or cash flow of the hedged item and the derivative. The Dollar-Offset Method can be applied either period-by-period or cumulatively (DIG Issue E8). For a perfect hedge, the change in the value of the derivative exactly offsets the change in the value of the hedged item, and the negative of their ratio is 1.00. In its cumulative form this means

$$-\left(\sum_{i=1}^n X_i / \sum_{i=1}^n Y_i\right) = 1.0, \quad (1)$$

where  $\sum_{i=1}^n X_i$  is the cumulative sum of the periodic changes in the value of the derivative and  $\sum_{i=1}^n Y_i$  is the cumulative sum of the periodic changes in the value of the hedged item. The minus sign in front of the ratio adjusts for the two sums being opposite in sign in a hedging relationship.

Of course, perfection is not necessary to qualify for hedge accounting. In a speech at the SEC's 1995 Annual Accounting Conference, a member of the SEC's Office of the Chief Accountant articulated an 80/125 standard for hedge effectiveness as measured by the Dollar-Offset Method (Swad, 1995). This became a guideline for assessing the hedge effectiveness of futures contracts under SFAS 80, and it carries over to testing the effectiveness of hedges under SFAS 133. The 80/125 standard requires that the derivative's change in value offset at least 80%

and not more than 125% of the value change of the hedged item.<sup>4</sup> The formal expression of the test is

$$0.8 \leq - \left( \frac{\sum_{i=1}^n X_i}{\sum_{i=1}^n Y_i} \right) \leq 1.25. \quad (2)$$

Anyone choosing this test should be aware that researchers question its reliability. (Canabarro, 1999, Kawaller and Koch, 2000, Althoff and Finnerty, 2001, and Finnerty and Grant). The essential problem is that this ratio test is very sensitive to small changes in the value of the hedged item or the derivative. For example, suppose that the hedged item is inventory valued at \$1,000,000 and the hedge is a short position in a futures contract. At the end of the quarter, suppose that the value of the inventory increased by some small amount, say \$10,000, or 1%. The short futures position will decrease in value by \$10,000, offsetting the change in the value of the underlying asset, plus or minus the change in the futures' basis. If the change in the basis is as little as 0.33% of the notional value (+\$3,333 or -\$3,333), then the Dollar-Offset Method implies that the hedge is ineffective because the short futures' value change is either 33% greater or 33% less than the inventory's value change. Canabarro has shown that under very reasonable assumptions about the distribution of changes in prices, the 80/125 standard rejects as ineffective 36% of all hedges when the coefficient of determination (correlation squared)  $R^2$  is 0.98.

## 2. Variability-Reduction Method

The Variability-Reduction Method and the Regression Method are closely related. The difference is that the Variability-Reduction Method assumes that the risk-minimizing derivative position is equal and opposite the hedged item. We call this a one-to-one hedge. The Regression

<sup>4</sup> The logic underlying 80/125 is that the standard is independent of the arbitrary choice of numerator and denominator because  $80\% = 4/5$  and  $125\% = 5/4$ .

Method assumes that you can implement a more effective hedge based on a statistical estimate of the risk-minimizing hedge.

If a one-to-one hedge performs perfectly, the change in the value of the derivative exactly offsets the change in the value of the hedged item,  $X_i + Y_i = 0.0$ . The Variability-Reduction Method compares the variability of the fair value or cash flow of the hedged (combined) position to the variability of the fair value or cash flow of the hedged item alone. This method places greater weight on larger deviations than smaller ones by using the squared changes in value to measure ineffectiveness. The test statistic we advocate for this method is the proportion of the hedged item's mean-squared deviation<sup>5</sup> from zero that the hedge eliminates:

$$VR = 1 - \frac{\sum_{i=1}^n (X_i + Y_i)^2}{\sum_{i=1}^n Y_i^2} \quad (3)$$

We use the mean-squared deviation from zero because the variance ignores certain types of ineffectiveness. For example, suppose that the change in the value of the hedged position is always  $-\$0.20$ ,  $D_i = X_i + Y_i = -\$0.20$ . If we use the variance of  $D_i$  in the numerator, the test statistic is 1.0 because the variance measures the variability around the mean of  $-\$0.20$ . However, since  $D_i = -\$0.20$  in every period in this example, the offset is not perfect. By using mean-squared deviations, the test statistic reflects the lack of offset in the means.

The critical value for determining how large a reduction in variability is sufficient to demonstrate hedge effectiveness must be specified in order for this measure to be useful.

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<sup>5</sup> Mean-squared deviation from zero is often used as a measure of forecast error when the target error is zero. The objective of the hedge is to eliminate all variability in the value of the hedged item. Therefore, the target for  $X_i + Y_i$  and its mean is 0.0, and any deviation from 0.0 represents ineffectiveness in the hedge, which the test of hedge effectiveness should detect.

Because of the similarity of this test to the Regression Method test, we believe that a standard of 80% is consistent with Lipe's (1996) suggestion.

### 3. Regression Method

The prospective measure of hedging effectiveness is based on the adjusted  $R^2$  produced by a regression in which the change in the value of the hedged item is the dependent variable and the change in the value of the derivative is the independent variable.

$$Y_i = \hat{a} + \hat{b}(X_i) + e_i, \quad (4)$$

where  $\hat{a}$  is the estimated intercept term,  $\hat{b}$  is the estimated slope coefficient, and  $e_i$  is the error term. Ederington (1979) shows that the estimated slope coefficient is the variance-minimizing hedge ratio.

Given our definitions of  $X$  and  $Y$ , the slope of this regression equation should be negative and close to  $-1.0$ . In terms of prospective effectiveness test, if the adjusted  $R^2$  is greater than 80%, then a hedge ratio equal to the regression slope coefficient,  $\hat{b}$ , would have been highly effective. The interpretation of the intercept term,  $\hat{a}$ , is also important. It is the amount per (data measurement) period, on average, by which the change in value of the hedged item differs from the change in value of the derivative. Consistent with the idea that the hedge should aim for a combined change in value of 0.0, the hedger should account separately for the intercept term.

The retrospective test of effectiveness that we recommend for the Regression Method is essentially the same as the test for the Variability-Reduction Method. It differs in that it explicitly allows for a hedge ratio that differs from 1.0 and the exclusion of part of the change in

the value of the derivative – that is, that the hedger implements a hedge based on the results of the regression estimates.<sup>6</sup> The retrospective Regression Variability Reduction test statistic is

$$RVR = 1 - \frac{\sum_{i=1}^n (-\hat{a} - \hat{b}X_i + Y_i)^2}{\sum_{i=1}^n Y_i^2} \quad (6)$$

#### IV. Implementing Hedge Effectiveness Testing

The hedger must identify the hedged item and the derivative, an objective, the data and time period to be used, and a test method and a standard for highly effective. SFAS 133 provides some guidance as to how to proceed with testing. Retrospective testing and the update of the prospective testing should be performed at least each quarter or each time a financial statement or earnings are reported until the hedge is unwound (SFAS 133, paragraph 20, and DIG Issue E7). Data used in retrospective testing must include the actual results since the inception of the hedge and may include additional historical data. Tests used to document hedge effectiveness must be consistent with the hedger's stated approach to risk management, and the hedger must use the same method to test the effectiveness of similar hedges unless different methods are explicitly justified.<sup>7</sup>

SFAS provides flexibility with respect to the frequency of data observation and the time span of observation to use in the effectiveness testing. When discussing risk-management issues, some authors argue that the testing interval should match the hedge's time horizon (Ederington, 1979, and Figlewski, 1984). For example, these others would suggest using annual data to

<sup>6</sup> In principle, the hedger can use the regression coefficients or any other values that the hedger believes will make the hedge more effective. In practice  $\hat{a}$  and  $\hat{b}$  may be sufficiently close to 0.0 and -1.0 that the hedger implements a simple one-to-one hedge. In that case, the Variability-Reduction Method and the Regression Method yield identical retrospective measures of effectiveness.

<sup>7</sup> The hedger must specify the method of retrospective testing and the length of the testing period, as well as perform the initial prospective testing, before implementing the hedge (SFAS 133, paragraph 62). However, SFAS 133 does

evaluate whether a particular derivative is an effective hedge of a 12-month exposure. However, matching exposure and measurement periods may limit the number of independent observations available for statistical testing. For this example, obtaining even 12 independent data points to test a 12-month hedge requires 12 years of historical data.<sup>8</sup> This may not be feasible given available data, or it may not be appropriate because the market changed substantially over that period of time. Therefore, we suggest using more frequent observations of the data over a shorter historical time period. In our illustration we use monthly and quarterly data to test the effectiveness of a 12-month hedge.<sup>9</sup>

As we indicated earlier, because SFAS 133 does not specify a bright line test to distinguish highly effective hedges from less effective or ineffective hedges, the interpretation of “highly effective” is a matter of judgment. SFAS 133, (paragraph 389) does say that the high-effectiveness requirement is intended to have the same meaning as the ‘high correlation’ requirement of SFAS 80. This requirement has taken on meanings that apply to the Dollar-Offset Method and the Regression Method. For the former, it has been interpreted to mean that the cumulative changes in the hedging derivative should offset between 80 percent and 125 percent of the cumulative changes in the fair value or cash flows of the hedged item (Swad, 1995). For the latter it has been interpreted to mean that the regression of changes in the hedged item on changes in the derivative should have an adjusted  $R^2$  of at least 80 percent (Lipe, 1996).

To illustrate the methods described here, we adopt the perspective of a U. S. company that is considering, on December 31, 1999, hedging a purchase of aluminum that the company

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permit the hedger to use different methods for prospective and retrospective testing provided it documents the choices before implementing the hedge.

<sup>8</sup> SFAS 133 allows the use of simulated data but provides little guidance for setting up the simulation. This paper uses historical data and leaves the discussion of simulation to future research.

<sup>9</sup> Whether the hedging effectiveness test results are sensitive to the measurement interval is a complex issue. The answer may vary depending on the characteristics of the data, including whether the price series exhibit drift or autocorrelation, neither of which is present in the data used in this paper.

expects to make on December 31, 2000.<sup>10</sup> The derivative is a long forward contract on the London Metals Exchange (LME).<sup>11</sup> On December 31, 1999, the cash price for delivery to the company's plant is \$1,712.30 per metric ton, compared to the cash and one-year forward prices on the LME of \$1,630.50 and \$1,641.00, respectively.

To determine whether the one-year forward contract is expected to provide a highly effective hedge, the company collected 1998 and 1999 monthly cash prices for delivery of aluminum to its plant and forward prices on the LME. The forward prices are the prices for delivery at the end of each year, respectively.<sup>12</sup> We illustrate the company's prospective test of hedging effectiveness as of December 31, 1999 and its subsequent retrospective tests of effectiveness for the 4 quarters of 2000. Our hedging example reports the tests of effectiveness using both monthly and quarterly data. For the Dollar-Offset Method, we calculate the ratio for each month and each quarter. For the Variability Reduction and the Regression Method we make all calculations for each quarter using the most recent two years of data.

Table 1 illustrates the calculations using the quarterly data. (Excel spreadsheets for this and all other calculations are available at [http://www.\\_\\_\\_\\_\\_](http://www._____). Columns 3 and 4 contain the prices of the derivative and column 5 includes the prices of the hedged item. Columns 6 and 7 compute the changes in the values of the derivative,  $X_i$  and the hedged item,  $Y_i$ . Column 8 calculates the Dollar Offset ratios,  $-X_i/Y_i$ . Note that on a quarterly basis the ratio falls outside the acceptable range 2 of the 8 quarters in the prospective period but none of the quarters in the year 2000. Column 10 is the square of the changes in the values of the hedged item,  $Y_i^2$  and

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<sup>10</sup> All of the illustrations assume static hedging strategies. SFAS 133 also permits hedge accounting for dynamic hedging strategies that are properly specified, documented, and tested (paragraphs 85-87, and DIG Issue E11).

<sup>11</sup> The New York Mercantile Exchange did not begin to trade aluminum futures contracts until mid-1999.

<sup>12</sup> The London Metals Exchange provides daily quotations for the cash price and for 3-month and 15-month forward contracts. To calculate the prices for a forward contract for delivery at the end of the year, we use linear interpolation between the two prices that fall on either side of the delivery time.

column 11 is the square of the changes in the hedged position,  $(Y_i + X_i)^2$ . Column 12 computes the squares of the hedged position based on the regression estimates shown in Figure 1.

$$(Y_i - \hat{a} + \hat{b}X_i)^2 = (Y_i - 12.057 - (-1.0203)X_i)^2$$

We use columns 10 and 11 for the Variability-Reduction Method. We base the prospective test on the sum of the first 8 item in each column. Specifically,

$$VR = 1 - \frac{\sum_{i=1}^n (X_i + Y_i)^2}{\sum_{i=1}^n Y_i^2} = 1 - \frac{2,658.36}{93,404.83} = 0.97 \quad (3.1)$$

We calculate the retrospective test for the first quarter of 2000 in the same way using the sums of quarters 2 to 9. The complete set of calculations for all quarters are in the spreadsheets. We use columns 10 and 12 for the Regression Method. We base the prospective test on the adjusted  $R^2$  of the regression, 0.99. We calculate the retrospective test for the first quarter of 2000 using the values of  $\hat{a}$  and  $\hat{b}$  estimated for the 8 quarters in 1998 and 1999 and implemented in the first quarter of 2000.

$$RVR = 1 - \frac{\sum_{i=1}^n (-\hat{a} - \hat{b}X_i + Y_i)^2}{\sum_{i=1}^n Y_i^2} = 1 - \frac{724.08}{93,404.83} = 0.99 \quad (6.1)$$

Table 2 reports the test of effectiveness for the Variability-Reduction Method and the Regression Method for all four quarters of 2000, using quarterly and monthly observations. The results are quite similar. The Regression Method records slightly higher levels of variability reduction because the estimates of the intercept and the slope are quite stable over time and therefore, using them enhances the results relative to the values of 0.0 and  $-1.0$  that are implicit in the Variability-Reduction Method. The results using quarterly data indicate that the derivative

eliminates virtually all of the variability of the hedged item, while the results using the monthly data indicate a variability reduction in the range of 90%.

## **V. Summary**

The Dollar-Offset Method is well established with an articulated 80/125 standard for effectiveness. Firms adopting this method should be aware that the test statistic is sensitive to observations with small changes in value. Because of this, the Dollar-Offset Method identifies a relatively high percentage of all hedges as not highly effective, even when the variability reduction approaches 98%. We believe this is a serious flaw. The Variability-Reduction Method and the Regression Method both measure effectiveness in terms of risk reduction. When the derivative is very similar to the hedged item, it appears likely that the differences between these two methods will be small. If the derivative and the hedged item are not very similar, the Regression Method will be superior, if the variance-minimizing hedge ratio is deviates materially from  $-1.0$  and is stable over time.

While we believe the descriptions in this article are a good guide for practice, the client and auditor must concur on the appropriate process for testing hedge effectiveness. Lastly, in this article we do not address a number of important and more complex issues, including dynamic hedging, option hedging, and the use of multiple derivatives to hedge.

Table 1  
Illustrations of the Hedge Effectiveness Testing Methods

1	2	3	4	5	6	7	8	9	10	11	12	
Quarter	Date	LME Forward Prices Next Year Delivery	LME Forward Prices Year End Delivery	Local Spot Prices	Change in LME Short Forward Position	Change in Local Spot Prices	Dollar-Offset Ratio		Squared Change in Local Spot Prices	Squared Change in Hedged Position	Squared Change in Regression Based Hedged Position	
	12/31/97	\$1,569.53		\$1,623.56								
1	3/31/98		\$1,482.77	\$1,521.99	\$86.76	-\$101.58	0.85		10317.77	219.48		
2	6/30/98		\$1,339.21	\$1,385.53	\$143.56	-\$136.46	1.05		18620.45	50.48	6.21	
3	9/30/98		\$1,347.19	\$1,410.80	-\$7.99	\$25.27	<b>0.32</b>		638.47	298.66	21.28	
4	12/31/98	\$1,310.07	\$1,238.00	\$1,319.79	\$109.19	-\$91.01	1.20		8282.30	330.68	62.26	
5	3/31/99		\$1,265.59	\$1,309.49	\$44.48	-\$10.30	<b>4.32</b>		106.17	1168.14	509.53	
6	6/30/99		\$1,411.25	\$1,468.03	-\$145.66	\$158.54	0.92		25135.95	166.08	6.61	
7	9/30/99		\$1,513.00	\$1,574.80	-\$101.75	\$106.77	0.95		11399.41	25.13	91.30	
8	12/31/99	\$1,640.99	\$1,630.50	\$1,712.29	-\$117.50	\$137.49	0.85		18904.29	399.71	26.06	
9	3/31/00		\$1,549.75	\$1,630.80	\$91.24	-\$81.49	1.12		6639.92	95.19	0.81	
									Sum 1 to 8	93404.83	2658.36	
									Sum 2 to 9	89726.98	2534.08	724.08
									Var. Red. 1 to 8		0.97	
									Var. Red. 2 to 9		0.97	0.99

Figure 1  
Regression of Quarterly Changes in Spot and Futures Prices 1998 - 99

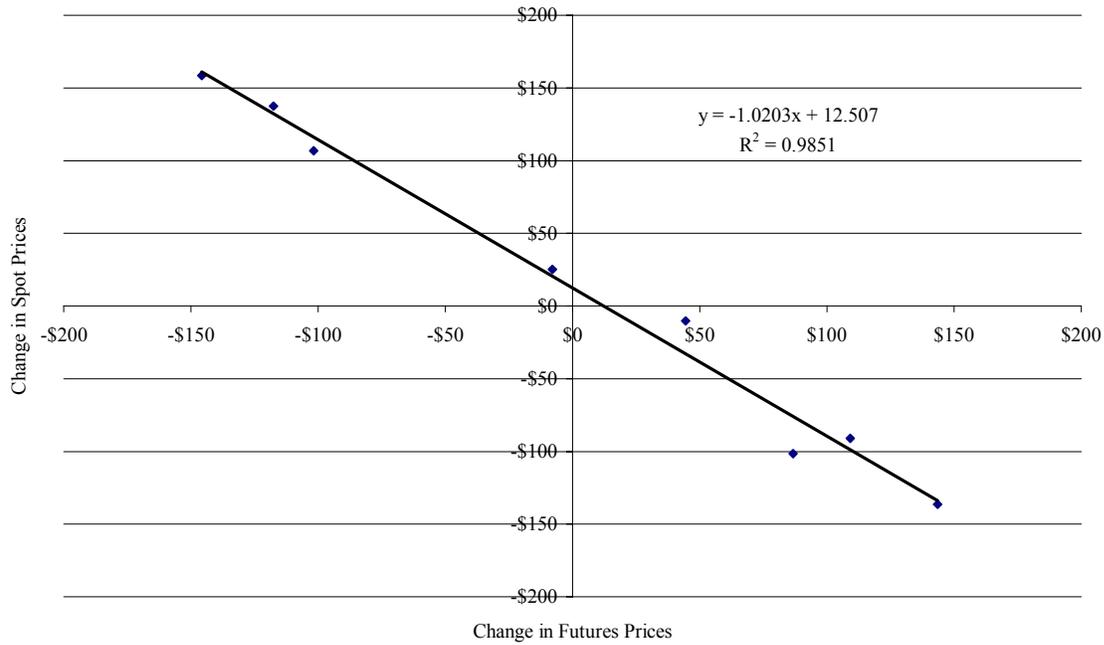


Table 2  
Quarterly Data

Variability-Reduction Method

Quarters	Variability Reduction
1 to 8	0.97
2 to 9	0.97
3 to 10	0.96
4 to 11	0.96
5 to 12	0.96

Regression Method

Intercept	Slope	R2	Variability Reduction
12.51	-1.02	0.98	
15.54	-1.00	0.99	0.99
18.14	-0.98	0.99	0.99
14.74	-0.98	0.98	0.98
			0.97

Monthly Data

Variability-Reduction Method

Months	Variability Reduction
1 to 24	0.95
4 to 27	0.88
7 to 30	0.88
10 to 33	0.88
13 to 36	0.89

Regression Method

Intercept	Slope	R2	Variability Reduction
4.20	-1.09	0.96	
5.28	-1.15	0.89	0.89
4.73	-1.18	0.90	0.90
3.67	-1.16	0.89	0.90
			0.91

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