

# CEO Overconfidence And Corporate Derivative Hedging Decisions

Abdullah N. Alsubaie

*This study investigates the effects of management overconfidence on corporate decisions to hedge financial risk. Specifically, it examines whether the CEO level of confidence affects the firm's decision to hedge interest rate and foreign currency exchange risk exposures. The main purpose of the study is to test the implied hypotheses that over-confident managers undervalue risk and consequently would use derivative hedging less than lower-confident managers. The study utilizes a Logit regression model to estimate the relationship between CEO overconfidence and hedging decisions for a sample of S & P 500 firms that are faced with interest rate and foreign currency exchange risk exposures. The preliminary empirical result shows a statistically significant positive relation for interest rate derivatives usage and CEO overconfidence. Also, it shows that CEO overconfidence has a statistically insignificant positive relation to the usage of derivatives to hedge foreign exchange risk. The result shows that dividend yield and firm size have significant effects on firms' decisions to use derivatives to hedge interest rate risk exposure. The result indicates that the ratio of foreign sales may have an impact on CEO overconfidence relation to interest rate and currency derivatives usage in that CEO is involved in hedging decisions to some degree as long as the foreign sale is not so high to offset the CEO influence in hedging decisions.*

*Keywords: Corporate Hedging, Derivative, CEO overconfidence.*

## 1- Introduction

Empirical studies have examined derivative holdings to identify causes that lead corporations to hedge financial risk exposures. This paper contributes to the empirical literature in hedging decisions by determining a new factor that has not been tested in prior studies. It examines the relation between corporate hedging and CEO level of confidence .Specifically, it examine whether the CEO level of overconfidence (high vs. low level of overconfidence) affects the firm's decision to hedge interest rate and foreign currency exchange risk exposures. The main purpose of the study is to test the implied hypotheses that over-confident managers undervalue risk and consequently use derivative hedging less than lower-confident managers. The related literature indicates that over confident managers are more likely to predict favorable future events to occur more often than unfavorable events. Furthermore, overconfident managers believe their firm is less risky than it actually is, and consequently is less likely to experience financial distress. Therefore, I expect overconfident CEO to engage in less usage of hedging derivatives for interest rate risk and foreign currency exchange risk exposures.

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The paper proceeds as follows. Section 2 reviews the literature related to corporate hedging and corporate governance and discusses how this paper fits into this literature. Section 3 discusses the methodology utilized and presents the main variables of the study. Section 4 presents the data and the sample used in the empirical tests. Section 5 presents the result of the study and finally section 5 offer the conclusion and limitation of the study.

## **2- Literature Review**

One question is still debated in the literature is what is the real motive behind corporate hedging is the main motive to examine the relation between CEO confidence and hedging activity. The following some of the studies that have examined the motivations for hedging

Jorion (1991) found that exchange risk is not priced in on the US. stock market and concludes that the exchange rate risk is insignificant and the US investors do not require premium for bearing the risk. Even though this result was challenged latter by Doukas, Hall and Lang (1999) .Geczy, Minton and Schrand (1997) found that the currency derivative usage increases when the firms face greater growth opportunities and tighter financial constraints. They also find that firms with extensive and economies of scale in hedging are more likely to uses currency derivative.

In different direction, Perfect, Wiles, and Howton (2000) investigate the influence of managerial compensation and corporate hedging. Their result suggests that deferred compensation does little to motivate managers to hedge optimally while option tends to encourage hedging. Lin and Smith (2003) examine the interaction between hedging, financing and investment decision. They found that hedging is positively related to leverage, which is consistent with debt capacity argument.

In other study, Knope, Nam and Thornton (2002) found that hedging activity is positively related to the sensitivity of manager's stock and stock option portfolio to stock price. They also found, but not statistically significant, that hedging activities are negatively related to the sensitivity of the manager's stock option portfolio to stock returns volatility.

Tufano (1996) finds evidence that hedging increase with managerial shareholdings and decrease with managerial option ownership. Other studies find no evidence that managerial risk aversion or shareholdings affect corporate hedging (Geczy et al, 1997 and Haushalter 1998)

Haushalter (1998), Gay and Nam (1999) use the debt ratio to measure expected costs of distress and find that higher debt ratio lead to greater hedging. Most studies interpret this relation as evidence that greater expected financial distress costs cause greater hedging. Most previous studies find that the likelihood of using derivatives increases with the firm size. A positive size effect is consistent with firms not hedging with derivative unless the benefits are larger than the fixed costs of establishing a hedging program.

In conclusion, the hedging literature indicates that firms may hedge for several reasons such as to benefit by hedging from the convex corporate tax function, reduce the cost of financial distress, and reasons related to managerial risk aversion and compensation. The study will control for these incentives and extend this literature by examining the actual practice of CEO in exercising their option, which serve as a proxy for confidence level, and its effect on hedging decisions.

The literature on managerial over-confidence pioneered by Roll (1986) when he investigates the hubris hypothesis of takeover which explains the role of biased managers in corporate takeover. It documents that firms that with hubris management overvalue the takeover benefit and pay too much for their targets. Recent literature provides more quantifiable way to measure managerial overconfidence. Malmendier and Tate (2002) provide two measures for overconfidence. First they used manager's stock option exercise as a proxy for overconfidence and argue that managers who hold their stock option until expiration can be classified as overconfident. Second, they measure overconfidence by managers net buying of the firm's stock. Managers who buy more than they sell for a period of time (5 years period in their study) are classified as overconfident. They found that these two measures are highly correlated. This study will employ the second measure of overconfidence as the data for this measure are freely available as discussed in the methodology section.

Malmendier and Tate (2002) using the first measure document that overconfident CEOs are more eager to make acquisitions especially when their firm has abundant internal resources. They conclude that overconfident CEOs are more likely to undertake value destroying acquisition than rational managers. Malmendier and Tate investigate the relation between investments and overconfidence and found that investment is significantly more responsive to cash flow if the CEO displays overconfidence.

Hackbarth (2004) develops a model that examines the effect of managerial traits on the capital structure decision and the firm value. The model shows that overconfident managers choose higher level of debt, issue debt more often and tend to time the capital structure decisions. He assumed that managers are rational in all aspects except for how they perceive the firm's

growth rate and riskiness. The author cite DeLong, Shleifer, Summer, and Waldmann (1991) work in that optimistic managers usually overestimate the growth rate of cash flows, while overconfident managers underestimate the riskiness of cash flow. They argue that overconfident managers believe a firm is less risky than it actually is and therefore less likely to experience financial distress.

In similar direction Fahlenbrach (2004) investigate the effect of founder CEO and stock market performance. He found that firms that run by founder CEO have a higher accounting performance and a higher firm valuation founder CEO firm invest more in R&D, have higher capital expenditures, and make more focused mergers and acquisitions. However, he doesn't consider the relation between founder CEO and overconfident which might explain most of these decisions. Founder CEO may be characterized by higher or less confidence level than other CEOs.

Following Knope, Nam, and Thornton (2002), this paper focuses on CEO of the company for two reasons. "First using all officers and directors mixes the incentives of the agent with different motivations. Second, while it is almost certainly true that more officers than just the CEO of the firm are involved in the hedging decision, the CEO retain ultimate authority over such as important decision as the hedging activities of the firm"

In view of the literature above, this paper hypothesis that CEO overconfidence would have a significant affect on the firm's decision to hedge as they undervalue the future riskiness of cash flow.

### **3- Methodology**

Mamendier and Tate (2002) measure overconfidence as the CEO habitual purchase of his company stock. They explain that rational CEO should minimize their holding of the company stock to the extent that is possible in order to divest themselves from idiosyncratic risk. They argue that overconfident is the reason why CEO habitually increase their equity position by acquiring new shares or accumulating new stock grants without selling any share to compensate. They classify CEO as over confident if he was in net buyer in the first years of the sample. Net buyers are CEO who bought stock on net at least one more year that he sold stock on net during his first five sample years. In this study I use this measure which they proved to be highly correlated with their other measure such as stock options exercise and CEO personal data

The paper utilizes Logit regression to estimate the likelihood that a firm uses derivative. The model is estimated with a dependent variable that is equal to one for derivatives users and zero for nonusers. I estimate a model for interest rate derivative and another model for currency derivative. Based on the related literature the following are the main independents variables. (Geczy, Minton and Schrand 1997).

- CEO over-confidence: a binary variable that is equal to one if the CEO is classified as overconfident and zero otherwise.

- Ratio of book to market value of the firm: book value of common shareholder's equity as of the end of the year less outstanding preferred stock / Market value is closing share price times common shares outstanding year-end
- Interest rate coverage ratio: Ratio of pretax income for 2001 plus interest expense to interest expense plus capitalized interest.
- Long term debt ratio. Ratio of the book value of the long-term debt as the end of the fiscal year to size.
- Dividend yield. Ratio of cash dividend per share to closing price per share
- Quick ratio. Ratio of cash and short term investment as of fiscal year end to current liability at year end
- Foreign sale ratio: foreign sales to total sale
- Size. The natural logarithm of total asset.

#### **4- Data**

Information about each firm's fiscal year-end derivatives ownership from 10-k forms filed electronically in the SEC's Electronic Data Gathering and Retrieval (EDGAR) database for the year 2001. Effective December 15, 1994, SFAS 119 requires firm to report detailed information on the direction and the purpose of national holding.

The studies restrict its analysis to the hedging practices of non financial firms because financial firms are both users and providers of risk management product.

Restricting the sample to firms that face ex ante financial price risk reduce noise in the empirical tests by focusing on the major cross-sectional differences that affect the incentive for hedging

The data for insider trading is freely available on the source of the insider trading data is the Ownership Reporting System, Records of the Securities and Exchange Commission (SEC) obtained from the National Archives and Records Administration. (<http://www.archives.gov>). The data set summarizes all insider transactions in all publicly held firms that were reported to the SEC from July 1978 to December 2001. The data items include the date of each transaction, the classification of the insider, the name of the insiders, the type of transaction, and the number of shares transacted etc.

The sample firms were collected from S & P 500 non financial companies. The sample firms face both exchange and interest rate risk exposure. Previous studies have used any of the following as an indication of exchange exposure: the firm disclose foreign assets in the Compustat Geographic Segment file or disclose positive values of 1) foreign currency adjustment 2) exchange rate effect 3) foreign income taxes or 4) deferred foreign taxes in annual Compustat files (Graham and Regress 1999). This paper classifies firms with foreign sale ratio more than .01 as exposed to currency exchange risk. The original sample include 165 companies, however after excluding firms that does not have insiders

information, the firms that have its current CEO for less than 5 years and companies that have missing data, the final sample includes 55 companies.

The following tables present the descriptive statistics. The sample firm has a high exposure of exchange risk according to the foreign sale mean ratio (.2 for currency users and .17 for non users)

**Table 1-** Descriptive Statistics for firms that use currency derivatives

	<b>OC</b>	<b>Size</b>	<b>BM</b>	<b>TAX Coverage</b>	<b>LD_ RATIO</b>	<b>DIV_YLD</b>	<b>Q_ RATIO</b>	<b>F_SALE _RATIO</b>
<b>Mean</b>	0.278	8.897	0.417	44.340	0.210	1.504	1.258	20.358
<b>Median</b>	0.000	8.986	0.328	2.598	0.215	1.327	0.845	16.508
<b>Maximum</b>	1.000	11.417	1.678	1242.850	0.500	6.076	4.580	40.028
<b>Minimum</b>	0.000	6.833	0.065	-479.855	0.000	0.000	0.314	1.354
<b>Std. Dev.</b>	0.454	1.144	0.336	232.895	0.151	1.638	1.167	11.156
<b>Probability</b>	0.024	0.560	0.000	0.000	0.421	0.025	0.000	0.331
<b>Observations</b>	36.000	36.000	36.000	36.000	36.000	36.000	36.000	36.000

*OC:: CEO Overconfidence which is a binary variable, BM: Book to Market, Div\_YLD: Dividends yield ratio , F-Sale\_Ratio: Foreign Sales Ratio, LD\_Ratio : long term debt Ratio , Size : Natural logarithmic of total assets, PR\_TAX\_COV pre tax interest coverage ratio, Q\_Ratio Quick ratio*

**Table 2-** Descriptive statistics for firms that are non- users of -currency derivatives

	<b>OC</b>	<b>Size</b>	<b>BM</b>	<b>TAX_ COV</b>	<b>LD_ RATIO</b>	<b>DIV_YLD</b>	<b>Q_ RATIO</b>	<b>F_SALE _RATIO</b>
<b>Mean</b>	0.421	8.912	0.474	17.929	0.274	0.629	0.867	17.093
<b>Median</b>	0.000	8.849	0.356	5.726	0.251	0.342	0.772	15.746
<b>Maximum</b>	1.000	10.513	1.818	113.736	0.608	2.282	2.071	37.881
<b>Minimum</b>	0.000	7.324	0.014	-3.217	0.006	0.000	0.118	0.000
<b>Std. Dev.</b>	0.320	0.964	0.409	33.396	0.148	0.750	0.538	11.171
<b>Probability</b>	0.204	0.520	0.000	0.000	0.834	0.282	0.435	0.600
<b>Observations</b>	19.000	19.000	19.000	19.000	19.000	19.000	19.000	19.000

*OC:: CEO Overconfidence which is a binary variable, BM: Book to Market, Div\_YLD: Dividends yield ratio , F-Sale\_Ratio: Foreign Sales Ratio, LD\_Ratio : long term debt Ratio , Size : Natural logarithmic of total assets, PR\_TAX\_COV pre tax interest coverage ratio, Q\_Ratio Quick ratio*

## 5- Empirical result

The results in table 3 show that overconfidence is not significant to the firm usage of currency derivatives. Moreover, the coefficient sign is positive which is not consistent with the prediction of the implied hypotheses of the paper. One explanation of the positive sign for overconfidence measure is that overconfidence loses its affect for some limit of foreign sales. In other words, when foreign sales are so high firms hedge regardless of CEO overconfidence. Table 3 tests show that overconfidence sign is changed to the predicted negative

sign after we exclude the foreign sales ratio from the regression. This may indicate the strong effect of foreign sales on the decision to hedge in a way that overconfidence CEO effect on hedging is weak when the foreign sales is large as the case in this sample. This unexpected result is might also due to the small sample size due the difficulty in collecting the data and small variations in the dependent variables. This can be improved in two ways. First is achieved by inclusion of more firms to the sample. Second is by using the national value of derivative as independent variables.

**Table 3:**

Logit estimation of the relation between the likelihood of a firm use of currency derivatives and proxies for incentive to hedge including overconfidence.

Dependent Variable: FX derivatives				
Method: ML - Binary Logit (Quadratic hill climbing)				
Date: 12/19/04 Time: 22:44				
Sample: 1 55				
Included observations: 55				
Convergence achieved after 5 iterations				
Covariance matrix computed using second derivatives				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-4.305899	3.962828	-1.086573	0.2772
Overconfidence	0.027867	0.825801	0.033746	0.9731
Book to Market	-0.584704	1.115243	-0.524284	0.6001
Dividend Yield	0.919445	0.350572	2.622701	0.0087
Foreign Sales Ratio	0.036969	0.032883	1.124244	0.2609
Long term Debt Ratio	-2.856202	2.497129	-1.143795	0.2527
Size	0.370024	0.400067	0.924907	0.355
Pre Tax Coverage Ratio	0.00091	0.00319	0.285194	0.7755
Quick Ratio	0.869951	0.55397	1.570393	0.1163
Mean dependent var	0.654545	S.D. dependent var	0.4799	
S.E. of regression	0.444766	Akaike info criterion	1.3233	
Sum squared resid	9.099562	Schwarz criterion	1.6517	
Log likelihood	-27.3897	Hannan-Quinn criter.	1.4503	
Restr. log likelihood	-35.4523	Avg. log likelihood	-0.498	
LR statistic (8 df)	16.12521	McFadden R-squared	0.2274	
Probability(LR stat)	0.040623			
Obs with Dep=0	19	Total obs	55	
Obs with Dep=1	36			

**Table 4:**

Logit estimation of the relation between the likelihood of a firm use of currency derivatives and proxies for incentive to hedge excluding foreign sales ratio

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Dependent Variable: FX derivatives  
Method: ML - Binary Logit (Quadratic hill climbing)  
Date: 12/20/04 Time: 18:52  
Sample: 1 55  
Included observations: 55  
Convergence achieved after 5 iterations  
Covariance matrix computed using second derivatives

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Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-2.757354	3.63583	-0.75838	0.4482
Overconfidence	-0.083368	0.793516	-0.10506	0.9163
Book to Market	-0.70663	1.026019	-0.68871	0.491
Dividend Yield	0.925609	0.355325	2.604967	0.0092
Long term Debt Ratio	-3.080209	2.437913	-1.26346	0.2064
Size	0.29623	0.38188	0.775716	0.4379
Pre Tax Coverage Ratio	0.000257	0.002906	0.088283	0.9297
Quick Ratio	0.867386	0.578407	1.499614	0.1337
Mean dependent var	0.654545	S.D. dependent var		0.479899
S.E. of regression	0.445544	Akaike info criterion		1.310849
Sum squared resid	9.329952	Schwarz criterion		1.602824
Log likelihood	-28.04834	Hannan-Quinn criter.		1.423758
Restr. log likelihood	-35.4523	Avg. log likelihood		-0.50997
LR statistic (7 df)	14.80793	McFadden R-squared		0.208843
Probability(LR stat)	0.038542			
Obs with Dep=0	19	Total obs		55
Obs with Dep=1	36			

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Table 4 shows the logit regression for the likelihood of using interest rate derivative. The result shows a weak significant support of overconfidence but with positive sign. Even though the result is still not significant for much of the variable, the result has improved. The reason for this improvement is that there is more variation in the dependent variable of the interest rate derivative usage than that of currency derivatives. This may indicate that the increase in the sample and the variations in the dependent variable may improve the result

**Table 5:**

Logit estimation of the relation between the likelihood of a firm use of interest rate derivatives and proxies for incentive to hedge.

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Dependent Variable: Interest rate derivative usage  
Method: ML - Binary Logit (Quadratic hill climbing)  
Date: 12/19/04 Time: 22:42  
Sample: 1 55  
Included observations: 55  
Convergence achieved after 5 iterations  
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-7.952229	3.942085	-2.01727	0.0437
Overconfidence	1.463044	0.829238	1.764322	0.0777
Book to Market	-1.677763	1.070214	-1.56769	0.117
Dividend Yield	0.579833	0.289175	2.005129	0.0449
Foreign Sales Ratio	0.021338	0.031419	0.67914	0.497
Long term Debt Ratio	2.204324	2.379707	0.9263	0.3543
Size	0.738173	0.386025	1.91224	0.0558
Pre Tax Coverage Ratio	-0.000688	0.002474	-0.27797	0.781
Quick Ratio	0.215879	0.419481	0.514633	0.6068
Mean dependent var	0.527273	S.D. dependent var		0.503857
S.E. of regression	0.466986	Akaike info criterion		1.381273
Sum squared resid	10.03148	Schwarz criterion		1.709746
Log likelihood	-28.98501	Hannan-Quinn criter.		1.508296
Restr. log likelihood	-38.04124	Avg. log likelihood		-0.527
LR statistic (8 df)	18.11245	McFadden R-squared		0.238063
Probability(LR stat)	0.020399			
Obs with Dep=0	26	Total obs		55
Obs with Dep=1	29			

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The results have improved for interest rate derivative decision. The Overconfidence measure is weakly significant to the model. However the coefficient is positive which is contrary to the expectation of the paper. Dividend yield and size have a significant affect on the decisions to uses interest rate derivative.

## 6- Conclusion and limitation

The empirical result shows a statistically significant positive relation for interest rate derivatives usage and CEO overconfidence. Also, it shows that CEO

overconfidence has a statistically insignificant positive relation to the usage of derivatives to hedge foreign exchange risk. The result shows that dividend yield and firm size have significant effects on firms' decisions to use derivatives to hedge interest rate risk exposure. The result indicates that the ratio of foreign sales may have an impact on CEO overconfidence relation to interest rate and currency derivatives usage in that CEO is involved in hedging decisions to some degree as long as the foreign sale is not so high to offset the CEO influence in hedging decisions

As this a preliminary study it has some limitation that can be improved in future draft. The main limitation is the small sample that is due to the difficulty in collecting the data as it is collected manually for derivative usage. Also the criteria used in selecting the sample can be improved. I used the foreign sales as the main criterion for collecting the sample. I should have more criteria for selecting the sample to select firms that have less exposure than my sample. Some firms used derivative for speculation reason may have included in the samples of hedgers. This problem can be solved with a large sample because few firm used this strategy.

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