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## Stock Performance following Private Placement: Evidence from Listed Firms across the Taiwan Strait

Dar-Hsin Chen    Leo Bin\*    Mark Puclik    Ying-Hsin Lee    Guan-Yu Lin

### Abstract

This paper estimates the long-term stock performances after private placement issuing, by focusing on the evidence of listed firms in Taiwan and Mainland China. In the analytical process, we apply (1) the buy-and-hold abnormal-return approach and (2) the Fama-French three-factor model based on calendar-time abnormal returns. Our sample consists of private placements announced within the period January 1, 2000 - December 31, 2007; and the data series are obtained from the Securities Data Company (SDC) database and Taiwan Economic Journal. Our findings indicate that: when using the buy-and-hold abnormal-returns model (combined with calendar-time portfolio returns), corporate stocks listed in both Taiwan and Mainland China have significantly underperformed following private placements. When measured by the Fama-French three-factor model, stock performance results statistically differ across the Taiwan Strait.

**Keywords:** Private placements; Long-term abnormal returns; Buy-and-hold abnormal returns; Fama-French three-factor model.

**JEL Classifications Codes:** G15, G35, G38

### Introduction

Private equity placements have experienced strong growths globally for the past thirty years. As an important financing tool alternative to public offerings, private placements raise capital by offering corporate securities to a relatively small number of selected institutions or qualified individual investors. Some researchers (e.g., Folta and Janney, 2004) argue that private placements are superior to public offerings for better controlling the problem of information asymmetry. The involved institutional and/or individual investors have relatively limited numbers but strong influence, making the offering firms more easily and more willingly to disclose information with the investors through the negotiation process, so as to affirm investors' confidence and to lower the agency cost. On the other hand, some other researchers (e.g., Wu, 2004) argue that due to less disclosure requirements for private placements (such as the bypassing of SEC registration in the US), and also due to the specific invested objects, there might be even more serious information asymmetry problems in private placements.

A difference in underlying risk (in the area of, such as, information asymmetry) is supposed to result in a difference in expected return. Hertz and Smith (1993) find that under

information asymmetry, US private-equity-issuing firms were averagely undervalued and their stock prices tended to increase after the issuing.

During the 1998-2007 decade, the growth rate (in volumes) of global private placement deals has been 17.44% per year, even though the 2008 financial meltdown caused the decline from the peak. Back in October 2001 and January 2002, with the revisions in “Corporate Law” and “Stock Exchange Law”, respectively, the private placement system was officially introduced to the Taiwan equity market. According to the latest report by Taiwan’s Financial Supervisory Commission, Taiwan’s private equity market grew to approximately US\$3.1 billion in 2010. Also during the past two successive years, Mainland China’s private equity market has grown tremendously.

Our paper is to examine the long-term stock performances following private placements are issued by corporations listed in the stock exchanges of Taiwan or Mainland China. The sample stock performances are measured by 1) the buy-and-hold abnormal-return (BHAR) model and 2) the Fama-French three-factor (FF3F) model.

As far as we know, there are previously no published works comparing the long-term valuation effects on private equity placement across the Taiwan Strait. The cross-strait economic ties have been getting closer than ever, with the deregulations of financial markets on both sides, and the new trade and investment agreements having been signed, such as Economic Cooperation Framework Agreement (ECFA). Within such a reformed framework, both Taiwanese firms and their Mainland China counterparts are looking for new growth opportunities to investing into and/or raising capital from each other’s institutional investors. The possibility of cross-listing of stocks across the strait has also increased; so the importance is growing for the academia and practitioners to have more comparison studies between those two stock markets.

## **I. Prior Findings in Private Placements**

The main method for private-equity-placement investors to participate in corporate management is through the board of directors. The board of directors, instead of individual stockholders, effectively monitors and disciplines the company’s management behaviors, which can strengthen the control of agency problems and information asymmetries. According to the information asymmetry hypothesis, a private equity placement can be the tool to deliver a variety of companies’ financial information that enhances the quality of information and thus the pricing of stocks (Liu, 2008). With information asymmetry, managers have edges to acquire key information than non-managing investors. When firms are overvalued, managers tend to choose public offering at the “overcharged” expense of

external stockholders (Myers and Majluf, 1984). But the investing public will tend to interpret the public offerings (instead of private placements) as a bad signal of corporate overvaluation, and the market reaction will lead to a negative announcement effect.

The theoretical model of Chemmanur and Fulghieri (1999) predicts that renowned firms tend to choose public offerings, while firms characterized by high information asymmetry tend to choose private placements. Hertzal and Smith (1993)'s empirical study of US stock market performance find that private placement is consistent with the information asymmetry hypothesis. Sophisticated investors know that undervalued firms might raise equity capital privately, so the pricing of the firms' value would be at discounts. Arguing that the price-discount benefits at least offset the information-hunting costs for private equity investors, Hertzal and Smith (1993) find that the average 3-day pre-announcement cumulative abnormal returns averagely amount to a positively significant 1.72%. For a window of (-29, +10) surrounding the event announcement, the average significant abnormal gain amounts to 9%. The information asymmetric hypothesis indicates that undervalued firms offer private equity in order to give the undervaluation signals to their targeted investors; and investors will modify their post-placement pricing of such stocks accordingly.

Janney and Folta (2003) also find a series of supportive evidence for the information asymmetry hypothesis: private equity placements send stronger signals when it has been a longer time period since the last private equity placements or research agreement; the signals are stronger when firms have a weaker reputation, as proxied by the prior number of private placements; and private equity placements send even stronger signals when they are bundled with research alliances.

The positive valuation effects are also documented by other researchers, showing that private equity placements help corporations to have a more concentrated ownership structure and thus reduce agency costs. Active investors who own private equities will be able to monitor the management more closely and ensure their operation efficiency and value enhancing (Shleifer and Vishny, 1986; Wruck, 1989; McDaniel II and McDaniel III, 1992; Chai, Lee and Sharma, 2011).

On the other hand, there also exists evidence of "neutral" or "negative" wealth effects of private placements. Wu (2004) argues that if, after private placement, ownership becomes concentrated in the hands of passive investors, the monitoring mechanism will not necessarily become more effective. According to his findings, compared with their public-offering investor counterparts, private-placement investors are not significantly more determined at monitoring or even confronting the management.

Hertzel et al. (2002) uses the buy-and-hold return (BAHR) model to examine the long-term abnormal returns of 619 US firms which have conducted private placements, finding positively significant short-term returns during the announcement period but negatively significant long-term returns after the private placements.

Chou et al. (2009) examine the relation between growth opportunities, long-term stock price performances and operating performances after private placements by analyzing abnormal returns of 371 private placement firms during 1980 to 2000, with the measure of Tobin's  $q$ . They find negatively significant three-year abnormal returns for high- $q$  firms following private placements. Moreover, not only negative long-run stock returns but also poor operating performances are concentrated in firms with high growth opportunities (as measured by Tobin's  $q$ ), indicating investors' over-optimism on high- $q$  firms.

Maynes and Pandes (2011) uses the conventional market model to examine the long-term valuation effects of "shorting the sale restriction period of private placements" on US and Canadian firms, finding that smaller firms averagely suffer the greatest long-term negative cumulative abnormal returns, because the change in legislation causes those smaller firms with greater information asymmetry to lose their signaling edges about their worth.

As for the Asian markets, Chen et al. (2002), based on a sample of 47 Singapore-listed firms, find that (a) the long-term cumulative abnormal returns (CARs) decline significantly subsequent to the private placement announcements; (b) private placement firms, in particular small-cap firms, underperform the market index benchmark. Shiu and Wei (2013) find that in Taiwan's stock market, a large number of private placements exhibit weak long-term abnormal returns. However, those placements offered to the corporate insiders (outsiders) are associated with positive (negative) stock performance, respectively. Zou et. al. (2011) find that the private placements issued by Mainland Chinese firms are associated with positively significant announcement effects yet insignificant effects during the post-event 1-year period.

The existing empirical results seem to vary, depending on what data series and/or statistical models are employed to measure the long-run stock returns in respective studies.

## **II. Data and Methodology**

### **A. Data**

From equity markets of both Taiwan and Mainland China, we collect the time series of stock prices and the sample of private placements issued during the 01/01/2000 – 12/31/2007 period. We search the Security Data Corporation (SDC) database with the keyword "private

placement”, identifying the data of new placement issues over the specific sample period. Daily share prices, book values, earnings per shares (EPS), and the benchmark stock market indices are obtained from the TEJ database of both Taiwan and Mainland China. Specifically, (a) the data only include private placements announced by firms that are listed on the Taiwan Stock Exchange, Shanghai Stock Exchange, and Shenzhen Stock Exchange; (b) All sample firms must have complete data in the SDC database and TEJ stock returns; (c) Private placements exclude warrants and other non-common-stock security types; (d) Utilities and financial institutions are excluded.

The initial sample consists of 1,200 and 700 private equity placements in Taiwan and Mainland China, respectively, issued across seven industries during the 2000-2007 period. After excluding unqualified samples, the final example consists of 618 and 385 samples of common stock private placements for Taiwan and Mainland China, respectively. Their descriptive statistics are summarized in Table I.

## **B. Methodology**

The approaches for measuring the long-run stock abnormal returns following the private placement occurrences can be classified as follows: (1) buy-and-hold abnormal returns (BHAR) method, (2) Fama and French (1993) three-factor (FF3F) model and (3) average monthly abnormal returns (AMAR) method (Fama, 1998). Most previous studies use BHAR to measure long-term abnormal returns. Barber and Lyon (1997) and Kothari and Warner (1997) indicate that the buy-and-hold abnormal returns measure investor experience precisely, and consider it as one of the most appropriate estimators of measuring long-run stock performance. Nevertheless, Fama (1998) argues that the BHAR method does not consider the cross-sectional correlation problem and the bad-model problem; to minimize such problems, he suggests using a monthly calendar-time portfolio regression to measure long-horizon abnormal returns, as the time-series variation of monthly abnormal returns on a portfolio can effectively remove the correlation of expected returns. The evidence of Mitchell and Stafford (2000) find that using the calendar-time portfolio approach is more powerful than using the BHAR method.

In addition, Barber and Lyon (1997) indicate that skewness problems of the estimating samples can be reduced by using portfolio benchmarks to measure long-term abnormal returns. Moshirian et al. (2010) consider that both firm size and the book-to-market ratio play important roles in testing abnormal returns as well. We first measure the relative abnormal buy-and-hold returns between a private-placement firm portfolio and a benchmark firm portfolio based on size and book-to-market matched firms over one-year, two-year and three-year holding periods following private placement announcements. We calculate the 12-

, 24- and 36-month abnormal holding period returns for firm  $i$  by the definition as follows:

$$BHAR_i = \prod_{t=1}^T (1 + R_{i,t}) - \prod_{t=1}^T (1 + R_{benchmark,t}) \quad (2.1)$$

where  $T$  is the length of the holding period measured by number of months, which represents the value of 12, 24 and 36,  $R_{i,t}$  is the monthly return for firm  $i$  in month  $t$ , and  $R_{benchmark,t}$  is the monthly benchmark return in month  $t$ . To control the possible skewness problem, we conduct the skewness-adjusted t-test for each private-placement event based on the cross-sectional standard deviation of firms' abnormal returns:

$$t_{BHAR} = \frac{BHAR_p \times \sqrt{(n)}}{\sigma(BHAR_p)} \quad (2.2)$$

where  $BHAR_p \times \sqrt{(n)}$  is the portfolio average and  $\sigma(BHAR_p)$  is the cross-sectional sample standard deviation of the cumulative BHARs for number of firms as  $n$ .

The evidence of Fama and French (1993) shows that stock returns are affected not only by merely the market factor, but also by firm capitalization size and the book-to-market value factor. We use the resulting three-factor model to estimate at portfolio's abnormal returns.

The calendar-time return is measured as follows:

$$R_{it} - R_{ft} = \alpha_0 + \alpha_1 (R_{mt} - R_{ft}) + \alpha_2 SMB_t + \alpha_3 HML_t + \varepsilon_{it} \quad (2.3)$$

where  $R_{it}$  is the monthly stock return of firm  $i$ ,  $R_{ft}$  is the one-month Treasury bill rate. (The value-weighted one-month Treasury bill rates are declared by the Central Bank in Taiwan and by the People's Bank in Mainland China, respectively.)  $R_{mt}$  is the return on the respective stock market index in month  $t$ ,  $SMB_t$  is the difference of average returns between the portfolios of small market-capitalization stocks and large market-capitalization stocks in month  $t$ ,  $HML_t$  is the difference of average returns between the portfolios of high book-to-market stocks and low book-to-market stocks in month  $t$ , and  $\varepsilon_{it}$  is the residual (Fama and French, 1993). The coefficients are estimated through the ordinary least squares regression. The estimate of the intercept coefficient ( $\alpha_0$ ), which provides a test of the null hypothesis that the average abnormal return is zero, is the monthly average abnormal return during the multi-year post-event period.

### III. Empirical Results

We focus on two measures to analyze the long-run stock returns following private placement. The first method is the buy-and-hold abnormal-returns (BHAR) in excess of the market

returns by high-growth and low-growth firms. We use Tobin's  $q$  to measure the growth opportunities and divide the sample firms into those "with high expected growth opportunities (high- $q$ )" and those "with low expected growth opportunities (low- $q$ )". Such two subsamples are set up by measuring market value vs. book value of common equity (ME/BE). High- $q$  firms refer to those with above-median ME/BE ratios and low- $q$  firms have below-median ME/BE ratios. This measure has been commonly used in the existing literatures because it precisely measures investor experience. The second method is the Fama-French three-factor (FF3F) model in which the monthly calendar-time returns on a portfolio of private placement firms are regressed on three factors.

#### A. BHAR Estimates

Table II summarizes the 1-, 2-, and 3-year post-issue mean and median stock performances for high- and low-growth firms in Taiwan. Panel A reports long-run BHARs relative to low-growth subsample firms. Panel B reports long-run BHARs relative to high-growth subsample firms. Panel C reports long-run BHARs with the full sample.

Table II shows that private-placement portfolios underperform the low- $q$  subsample, high- $q$  subsample, and the full sample of Taiwan-listed stocks. For example, for low- $q$  firms, the 1-year BHARs are -6.7828%, and the 2-year BHARs are -7.0796%. For high- $q$  firms, the 1-year BHARs are -62.2476%. All these BHAR estimates are negatively significant at the 0.01 level. Similar with the first- and second-year results, in the third year following a private placement announcement, the mean and median BHARs are also negatively significant relative to both the high- $q$  and low- $q$  subsamples. Consistent with previous findings in other equity markets, the mean BHARs are negatively significant after 1, 2, and 3 years, providing further evidence of stock price underperformance subsequent to private equity announcements in Taiwan.

Table III summarizes the BHAR estimates of Mainland China private placement samples. These results are somehow different from those from Taiwan private placements, with positive mean BHARs reported in Panel A, and negative mean BHARs reported in both Panels B and C. The long-term stock underperformances are less severe for low- $q$  private-placement-offering firms, compared with their high- $q$  counterparts. The evidence of post-placement underperformance is relatively more concentrated in high-growth firms.

Jointly, there exists evidence of long-term underperformance for private placements in both Taiwan and Mainland China. Comparing results between Tables II and III, Taiwan's private placements seem to even underperform by more than those of China. Our results are consistent with the evidence of Chou et al. (2009), in which they also find negative long-run

stock returns are concentrated in high- $q$  firms, possibly due to investors' over-optimism on the growth prospects of such firms.

#### **B. FF3F with Calendar-Time Abnormal Returns**

Table IV summarizes the estimation results of using Fama and French (1993) three-factor models (as shown in Equation 2.3) for the time-series regressions of monthly private-placement portfolio returns. The predicted signs vary based on the different theories and hypotheses. Myers and Majluf (1984) predict  $\alpha_1$  to be negative because of market mechanism. Due to different effects for the size factor according to various existing literatures, the expected sign of  $\alpha_2$  is unsure. Janney and Folta (2003) attribute negative abnormal returns to high expected growth opportunities, and they thus predict the sign of  $\alpha_3$  to be negative.

Panel A of Table IV reports that the average monthly abnormal return on the portfolio of private-placement-offering Taiwan firms, which is measured by the intercept of the calendar portfolio regression, amounts to 1.7060% ( $t = 1.5980$ ) during the 1-year post-placement period. However, it is not an evidence of "statistically significant" 1-year abnormal returns. On the other hand, the average monthly abnormal returns over the windows of 2-year (1, 24) and 3-year (1, 36) post-placement periods amount to 3.2712% and 3.7762%, respectively; and they are both positively significant at the 0.01 level. Such findings from the 2- and 3-year performances are in contrast with Hertz et al. (2002) and Wruck and Wu (2009), who find significant long-term after-placement value losses instead of gains.

As for firms listed in the Mainland China stock market, the results reported in Panel B reaffirm the existence of 1-year post-event value gains, with the corresponding intercept being positively significant (with  $\alpha_0 = 2.2064$ ,  $t = 3.5228$ , at the 0.01 level). Also for the 1-year performance, the market risk premium effect is positively significant (with  $\alpha_1 = 2.6877$ ,  $t = 4.7260$ , at the 0.01 level). Nevertheless, those abnormal returns turn to be negatively insignificant but it consistently takes negative and insignificant 2 years after (with  $\alpha_0 = -0.0597$ ,  $t = -0.1029$ ) and 3 years after (with  $\alpha_0 = -0.3428$ ,  $t = -0.5139$ ) the private placement events. Other coefficients presented in Table IV are also statistically insignificant, including the SMB "size effects" and the HML "book-to-market ratio effects" for the post-placement 1-, 2- and 3-year period, across both Taiwan- and Mainland China-listed firms. Such findings are apparently inconsistent with Fama and French (1992), who have reported that cross-sectional stock returns are considerably driven by firm size and book-to-market value.

#### **IV. Conclusions**

This paper examines the long-run stock performances following private placements, based on

the sample of Taiwan and Mainland China corporations during the period of 2000-2007. Our buy-and-hold abnormal-return results indicate that across the Taiwan Strait, there are negative abnormal stock returns following private placements in both high- $q$  and low- $q$  firms, with high- $q$  sample firms suffering even greater post-placement underperformance than their low- $q$  counterparts. When the Fama-French three-factor model (combined with calendar-time portfolio returns) is employed, however, the evidence of negatively significant abnormal returns are only found in Mainland China sample firms during the first year subsequent to their private placement announcements. By comparison, in Taiwan sample firms, we find no statistically significant evidence of underperformance during the post-event 1-, 2- or 3 years; instead, our results show the existence of significant outperformance (at the 0.01 level) for private-placement-offering firms during the second and third year. Furthermore, across the Taiwan Strait, the SMB “size effects” and the HML “book-to-market ratio effects” seem to be insignificant for the post-placement 1-, 2- and 3-year period.

Our findings based on the two stock markets across the Taiwan Strait seem to be inconsistent with most of prior studies, which generally document a) there are significant long-term after-placement gains under the BHAR framework; b) there are no such significant gains under the calendar-time portfolio return framework; and/or c) there are significant wealth effects (explanatory powers) from both firm size and book-to-market ratio factors on the post-event long-run stock performance. In particular, this study sees no significant evidence to support that positive performances are concentrated in high-growth firms as predicted in Fama and French (1993), even though their model has accounted for the firm size and book-to-market ratio effects. According to the more current studies such as Griffin (2002) and Fama and French (2012), the Fama-French factor effects are likely to be “local” (e.g., country- or region-specific) rather than “global”.

A closer economic relationship between Taiwan and Mainland China, signaled by a series of economic agreements and financial deregulations, is driving cross-strait trade, investing and financing activities, including open-market acquisitions and private placements of ownerships. With such developments, a reduction in information asymmetry can be anticipated; and even cross-listing of stocks may be possible in the foreseeable future. However, as our findings indicate such specific patterns of long-run stock performance following private placements, it should bring to our attention that the equity investing results in these two stock markets across the Taiwan Strait might differ from those in other markets. Further studies will become growingly important regarding financial investments in this area.

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**Table I. Time and Industry Distributions and Sample Characteristics of Private Placements from 2000 to 2007**

This table presents the time and industry distribution of private placements in Taiwan and Mainland China. The sample is drawn from the SDC database.

Panel A: Time distribution of the sample of private placements

year	Taiwan			Mainland China			Full sample	
	Frequency	Cumulative frequency	%	Frequency	Cumulative frequency	%	Frequency	%
2000	62	62	8.99	104	104	22.46	166	14.40
2001	52	114	7.55	43	147	9.29	95	8.25
2002	110	224	15.97	59	206	12.74	169	14.67
2003	111	335	16.11	51	257	11.01	162	14.06
2004	117	452	16.98	96	353	20.73	213	18.48
2005	94	546	13.64	21	374	4.54	115	10.00
2006	135	681	19.6	32	406	6.92	167	14.50
2007	8	689	1.16	57	463	12.31	65	5.64
Total	689		100	463		100	1152	100.00

Panel B: Industry distribution of the sample of private placements

Industry	Taiwan	China	Total	%
Construction	18	17	35	3.04
Manufacturing	583	363	946	82.12
Pers/Bus/Rep Svc	44	37	81	7.02
Radio/TV/Telecom	4	4	8	0.69
Retail	6	5	11	0.96
Transportation	7	25	32	2.78
Wholesale	27	12	39	3.39
Total	689	463	1152	100.00

**Table II. Long-Run BHARs of Private Placement Firms in Taiwan**

This table reports buy-and-hold abnormal returns (BHARs) for the sample firms relative to control firms following private placement announcement. The BHARs begin from the first month after announcement to the end of the three-year period. The benchmark control firms are divided into high-growth groups versus low-growth groups by the sample median value of Tobin's  $q$ . To test the significance of the mean BHAR, the cross-sectional  $t$ -statistic is used.

Panel A: Long-run BHARs relative to low-growth subsamples

Year	BHAR (%)		$t$ -stat
	Mean	Median	
1-year	-6.7828	-7.2018	-4.2660***
2-year	-7.0796	-7.4437	-4.2731***
3-year	-7.6244	-7.9930	-4.2860***
(1-3)	-7.2209	-7.6767	-4.0946***

Panel B: Long-run BHARs relative to high-growth subsamples

Year	BHAR (%)		$t$ -stat
	Mean	Median	
1-year	-26.2476	-26.499	-3.8048***
2-year	-26.6850	-26.699	-3.8119***
3-year	-27.0980	-27.459	-3.8248***
(1-3)	-26.6044	-27.1857	-3.6330***

Panel C: Long-run BHARs relative to full samples

Year	BHAR (%)		$t$ -stat
	Mean	Median	
1-year	-15.3688	-15.2026	-4.2780***
2-year	-15.2138	-15.5059	-4.2886***
3-year	-15.2906	-15.6600	-4.2905***
(1-3)	-15.1559	-15.5827	-0.3212

Notes: \* Indicates statistical significance at the 0.10 level.

\*\* Indicates statistical significance at the 0.05 level.

\*\*\* Indicates statistical significance at the 0.01 level.

**Table III. Long-Run BHARs of Private Placement Firms in Mainland China**

The descriptions for this Table are similar to those for the Table II.

Panel A: Long-run BHARs relative to low-growth subsamples			
Year	BHAR (%)		t-stat
	Mean	Median	
1-year	0.1910	-0.0974	-3.7883***
2-year	0.0767	-0.2174	-3.9105***
3-year	0.0445	-0.2168	-3.9440***
(1-3)	0.8220	-0.0026	-2.9319***

Panel B: Long-run BHARs relative to high-growth subsamples			
Year	BHAR (%)		t-stat
	Mean	Median	
1-year	-1.0522	-1.7930	-5.0905***
2-year	-1.8866	-1.8510	-6.0060***
3-year	-1.9355	-2.0161	-6.0579***
(1-3)	-5.4537	-6.3367	-2.9319***

Panel C: Long-run BHARs relative to full samples			
Year	BHAR (%)		t-stat
	Mean	Median	
1-year	-7.0405	-7.6092	-2.4561**
2-year	-7.1548	-8.2870	-2.5780**
3-year	-7.1879	-8.1662	-2.6129***
(1-3)	-4.7311	-6.7917	-6.3318***

Notes: \* Indicates statistical significance at the 0.1 level.

\*\* Indicates statistical significance at the 0.05 level.

\*\*\* Indicates statistical significance at the 0.01 level.

**Table IV. Time-Series Regressions of Monthly Private Placement Portfolio Returns on Fama-French Three-Factor Models**

This table uses the calendar-time portfolio approach; excess returns of the event portfolio are regressed on Fama–French three factor model as follows:

Parameters	Estimation time period			
	Predicted Sign	1-year	2-year	3-year
<b>Panel A: Firms listed in Taiwan (N = 689)</b>				
$\alpha_0$		1.7060 (1.5980)	3.2712 (3.0533)***	3.7762 (3.3306)***
$\alpha_1$	(-)	0.7928 (0.6927)	-0.8913 (-0.7761)	-1.2599 (-1.0366)
$\alpha_2$	(?)	-0.0211 (-0.0217)	0.2025 (0.2076)	0.4197 (0.4064)
$\alpha_3$	(-)	0.1664 (0.4362)	-0.2973 (-0.7763)	-0.0875 (-0.2160)
$R^2$		0.4395%	0.8187%	1.8629%
$F$		0.640126	1.196845	2.752543**
<b>Panel B: Firms listed in Mainland China (N = 463)</b>				
$\alpha_0$		2.2064 (3.5228)***	-0.0597 (-0.1029)	-0.3428 (-0.5139)
$\alpha_1$	(-)	2.6877 (4.7260)***	0.8257 (1.5671)	0.5938 (0.9804)
$\alpha_2$	(?)	0.0054 (1.2742)	0.0035 (0.8954)	0.0064 (1.4277)
$\alpha_3$	(-)	0.8050 (1.2126)	0.0512 (0.0832)	-0.0918 (-0.1298)
$R^2$		11.8373%	2.1464%	1.6741%
$F$		14.85876***	2.427494*	1.884184

Notes: the t-statistics are in parentheses.

\* Indicates statistical significance at the 0.1 level.

\*\* Indicates statistical significance at the 0.05 level.

\*\*\* Indicates statistical significance at the 0.01 level.

## Options Traders Reacting to Bad News: The SEC versus Goldman Sachs

Ryan McKeon

### Abstract

This paper examines a specific case to shed light on the issue of how people trade during times of crisis, with specific focus on the options market and various options trading strategies. On April 16<sup>th</sup> 2010 the SEC announced charges against Goldman, Sachs & Co. for alleged fraudulent dealings, causing a significant share price decline. I examine the choices that options traders made in response to this market event, in terms of both choice of strategy (such as long call, straddle etc.) and choice of option (maturity and strike price chosen). Volume in Puts spiked immediately, and evidence suggests that such trading was highly profitable for at least 30 minutes following the announcement. Traders also implemented volatility trades in the options market, although evidence suggests that they lost money on this activity. Trading in the weeks following the SEC announcement indicates that strong positive stock returns prompted increased trading in both Calls and Puts, while spikes in implied volatility discouraged such trading. Surprisingly, volume in volatility trades was not significantly affected by changes in implied volatility.

**Key words:** crisis, options, trading

**JEL Codes:** G01, G02, G11

The goal of this paper is to contribute to our understanding of why people trade and what returns they receive when they do. The specific focus is on the options market and the variety of different trading strategies which are available to investors in this particular sector of the financial markets. The focus is also on trading during extraordinary times of crisis, rather than more general market conditions.

On the 16<sup>th</sup> of April 2010 the Securities and Exchange Commission (SEC) announced charges against Goldman, Sachs & Co (hereafter, simply “Goldman”) for alleged fraudulent dealings. Shares of the company, trading under ticker GS, ended the day at a price of \$160.70 per share after opening the day that morning at \$183.62 and reaching a low point on the day of \$155.55. The news of the SEC's decision was delivered publicly for the first time at 10:36:51 a.m. Eastern Standard Time, as recorded by Bloomberg newswire. This paper studies the actions which options market participants took in response to this dramatic negative news announcement. I study trading on the day of the announcement and during the weeks that followed up to the resolution of the issue (the payment of a fine by Goldman on July 15<sup>th</sup> 2010).

Much prior research has focused on the issue of price discovery and the process with which information is impounded into financial asset prices. Research has also focused on informed trading *prior to* various public announcements and the predictive quality of such trading. Finally, prior research has extensively explored the stock price reaction to and subsequent long-run performance following various public announcements. However, there is far less research on the trading choices that financial market participants make and on the details of their reaction to significant public announcements in terms of trading choices. This paper attempts to contribute

to this area in order to expand our knowledge of the trading choices financial market participants make during unusual times of crisis.

On the announcement day I find that volume in Put options spiked immediately following the announcement, and the evidence suggests that such trading was highly profitable for at least 30 minutes following the announcement, a surprising length of time. Somewhat less obviously, trading volume in Call options was also abnormally high. One might suspect that this was simply traders closing out existing Call option positions as the Goldman share price dropped, but an examination of open interest data suggests that much of the trading was opening of new Call option positions. This is consistent with contrarian trading on the part of investors as the share price dropped dramatically.

Traders also implemented volatility trades in the options market, although evidence suggests that this activity was not profitable.

Finally, the announcement prompted unusually large volumes of spread trading in both Call and Put options, with the surprising finding that this volume spike was considerably larger in Calls than Puts.

I further examine the trading in the options markets in the weeks following the SEC announcement, all the way up to the resolution of the issue on July 15<sup>th</sup> 2010 when Goldman paid a fine to the SEC. I find that trading in individual Call or Put trades was positively related to lagged stock returns, with positive returns prompting both greater Call and Put volume the following day. In particular, large positive return shocks – defined as returns above the 90<sup>th</sup> percentile of returns over the period - prompted higher volumes of individual Call and Put trading the following day. By contrast, trading in straddles and spread trades was negatively related to lagged stock returns. Interestingly, implied volatility was not a significant determinant of straddle trading. However, trading in individual Call and Put contracts was negatively related to lagged implied volatility, consistent with traders being less active in the options market when individual options were perceived as expensive.

There are limitations in using a single company and a single event to learn about trading behavior. However, the study does shed light on options trading behavior and the fact that a single company is involved then allows Goldman to act as its own control for firm-specific factors influencing trading as I follow the pattern of trading over time.

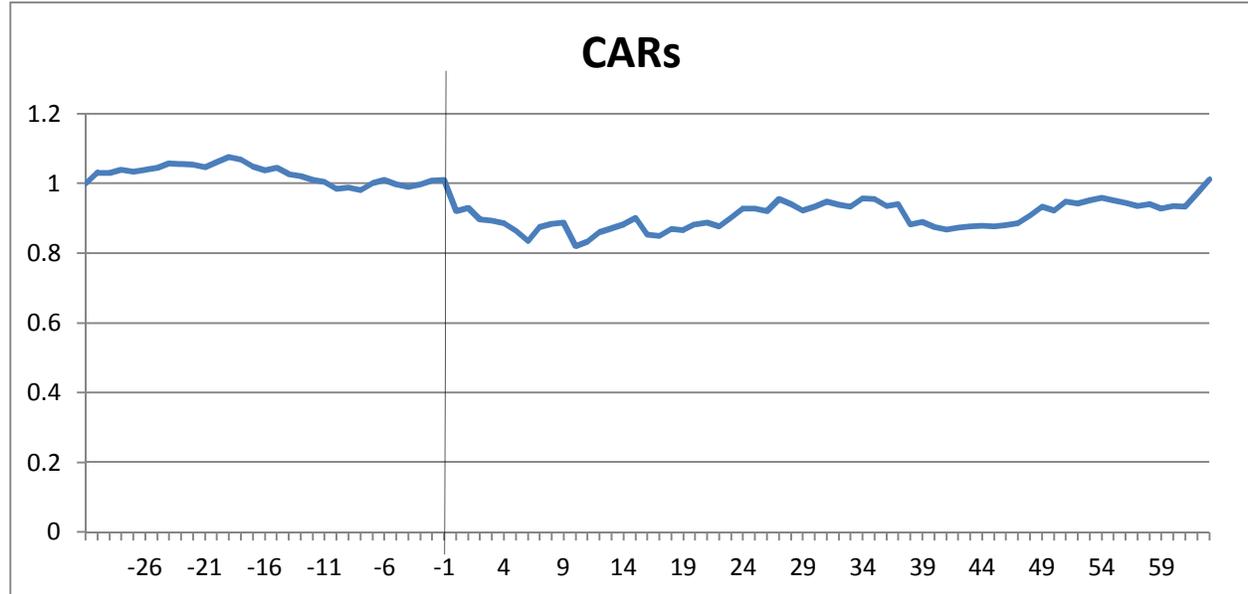
### **Event Details**

On the 16<sup>th</sup> of April 2010 the SEC brought charges against Goldman for alleged fraudulent dealings. The statement by the SEC said in part: “The Securities and Exchange Commission today charged Goldman, Sachs & Co. and one of its vice presidents for defrauding investors by misstating and omitting key facts about a financial product tied to subprime mortgages as the U.S. housing market was beginning to falter.”<sup>1</sup> We should note that Goldman was a well-established firm with a long history, and that the exact future consequences of the SEC's actions were not immediately known. Potential implications included a monetary fine being imposed on

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<sup>1</sup> See <http://www.sec.gov/news/press/2010/2010-59.htm>

the firm, but the exact size of such a fine was not specified or even hinted at in the SEC's statement.



**Figure 1: Cumulative Abnormal Returns**

This chart shows the Cumulative Abnormal Returns to Goldman Sachs stock around the announcement date based on the 4-factor model of expected returns (see Equation 1). The X-axis shows the days relative to the announcement.

Figure 1 reports the abnormal return suffered by Goldman on April 16<sup>th</sup> and the continuing CARs in the weeks thereafter. The results are based on the 4-factor model of expected returns, specifically:

$$R_{GS} = \alpha + \beta[R_M - R_f] + \beta_{Size}[SMB] + \beta_{B/M}[HML] + \beta_{MOM}[UMD] + \varepsilon \quad (1)$$

where  $R_{GS}$  is the return on Goldman stock,  $\beta[R_M - R_f] + \beta_{Size}[SMB] + \beta_{B/M}[HML] + \beta_{MOM}[UMD]$  is the expected return with  $R_M - R_f$  the market risk premium. SMB, HML and UMD are the returns on the Fama-French size factor portfolio, Fama-French book-to-market factor portfolio<sup>2</sup> and Carhart[1997] momentum factor portfolio respectively.  $\alpha$  is the component of the return of Goldman stock not explained by the expected return. Time subscripts are omitted for notational convenience.  $\beta$ ,  $\beta_{Size}$ ,  $\beta_{B/M}$  and  $\beta_{MOM}$  are sensitivities of the returns on Goldman stock to the returns on the factor portfolios, as estimated over the T-300 to T-46 time period prior to April 16<sup>th</sup> 2010. The very large negative abnormal return is clearly indicated in Figure 1, with the T-1 to T+1 period of April 15<sup>th</sup> to April 19<sup>th</sup> registering a cumulative abnormal return (CAR) of -8.58%.<sup>3</sup>

<sup>2</sup> See Fama and French [1993] for theoretical explanation, and the website of Professor Ken French for details of the data at [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)

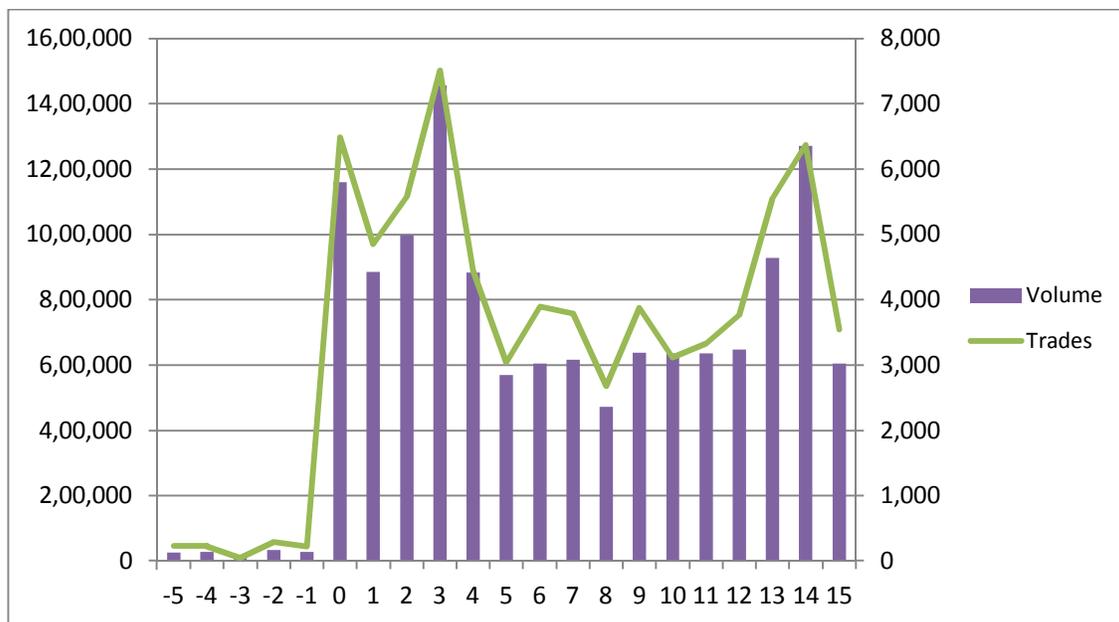
<sup>3</sup> The negative CAR over the event period is robust to alternative model specifications of expected return.

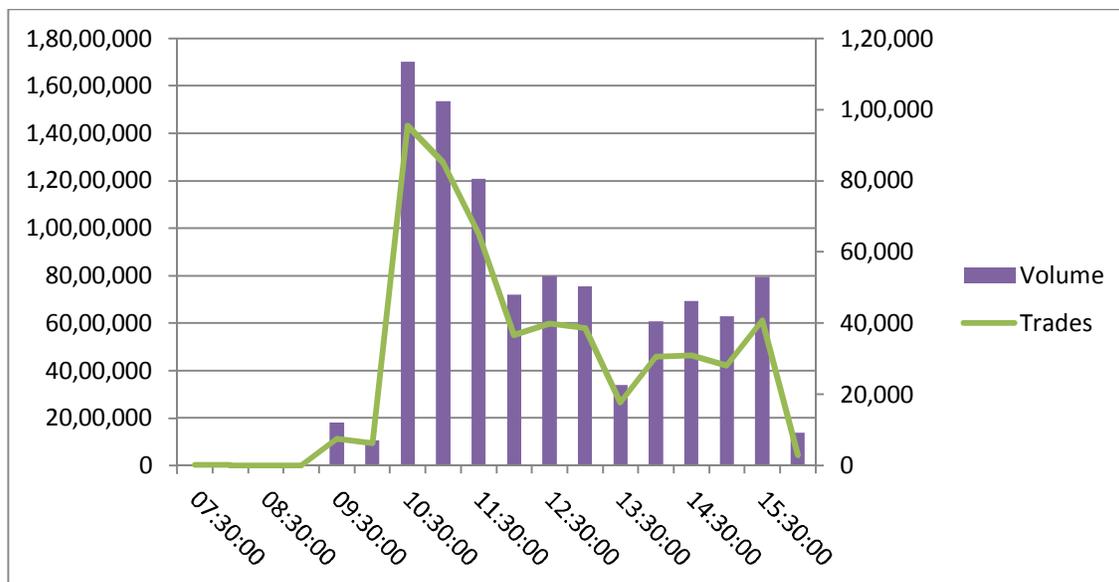
### Stock Trading

Figure 2 summarizes the intra-day volume of trading in shares of Goldman stock. As already noted, the volume of trading on April 16<sup>th</sup> 2010 was unusually high, complimenting the abnormal negative return. Figure 2 indicates that the volume of trading increased dramatically following the announcement by the SEC.

Figure 2 summarizes the volume of trading for each half hour of the day, where the time listed is the start of the period. In other words, 10:30:00 AM reports the results for the 10:30:00 to 10:59:59 AM Eastern Standard Time period during the day. The results for both the number of trades and the number of shares traded indicate that there was no unusual volume of trading prior to the announcement. The unusually large volumes of trading began after the announcement, and the 10:30:00 - 10:59:59 period which includes the announcement time of 10:36:51 saw the largest volumes of trading. All subsequent time periods show a decline in number of trades and shares traded relative to this period. Further evidence of this pattern of trading comes from the more detailed look at trading around the event itself, where number of trades and shares are reported by number of minutes before/after the event (t-5 to t+15 minutes). The volume of trading clearly spikes right on the event minute after not showing any unusually high levels of trading right up until that point in time.

The rapid response of the market raises the question of whether programmed or algorithmic trading could be responsible for some of the orders filled. This is an intriguing notion, but unfortunately not one that can be answered with the dataset available to me which does not include the type of traders involved.





**Figure 2: Intra-Day Volume of Stock Trading**

These charts show the intra-day volume of trading in Goldman stock. The top chart reports the trading volume in the minutes around the announcement, with the X-axis being the number of minutes before/after. The bottom chart reports the trading volume by 30-minute period during the day, where, for example, 10:00:00 refers to the 10:00:00 to 10:29:59 time frame based on Eastern Standard Time (EST).

**Literature Review**

The paper closest to my study is that of Fodor and Stowe [2012]. The paper studies the activity and price action in the financial markets of British Petroleum (BP) following a major disaster when a drilling rig owned by the company exploded in April of 2010 (coincidentally, very close to the time of the Goldman announcement by the SEC studied in this paper), causing loss of life and costly environmental damage. That paper documents the manner in which information was shared and integrated across different financial markets in the aftermath of the incident and thus contributes to our understanding of price discovery and expectations across different markets. My paper is similar, but has the focus of examining the actual trading, including specific trading strategies, undertaken by traders in the options markets.

The announcement by the SEC had the effect of decreasing the price of Goldman stock and increasing its volatility. These are both understandable consequences of a significant negative announcement regarding a firm and therefore, some may argue, predictable to some extent. If a trader had knowledge of or otherwise predicted the announcement ahead of time, there are some straightforward examples of trades which would benefit from the resulting price decrease and increased volatility. This paper, however, examines the trading activity *after* the announcement and in theory there need not be abnormal trading volume if prices react quickly and efficiently to the news and traders do not see any opportunity for abnormal returns<sup>4</sup>. On the other hand, a

<sup>4</sup>Trading in the short-run *prior to* the announcement is also potentially of interest for different reasons. However, I find no evidence of significant trading volume in the minutes or days immediately prior to the SEC's announcement.

behavioral viewpoint would suggest that such a dramatic announcement would motivate large trading activity in response, even if that activity does prove unprofitable.

Trading choices may be driven by several factors, including market liquidity and risk profile of different financial assets. Chakravarty, Gulen and Mayhew [2004] studied the contribution of options markets to the price discovery process, estimating that the option market's contribution to price discovery is approximately 17% on average. Broussard, Muravyev and Pearson [2013], however, provide evidence that option quotes do not contain any additional information about future stock prices. The authors reach this conclusion after identifying instances where the stock price implied by Put-Call parity differs from the actual reported stock price, and studying the stock and option markets for the subsequent adjustments.

There is ample evidence in the literature that investors implement short-term trades in order to profit from expected market swings prior to public announcements or events. For example, Wong, Thompson and The [2011] examine the trading in the options market prior to the attacks of September 11<sup>th</sup>, 2001 and find evidence of traders positioning themselves to profit from a sharp market decline in the weeks leading up to the attacks. Specifically, the authors find evidence of traders establishing unusually large positions in long Put positions, Bear Spread positions and naked short Call positions - all positions designed to profit from a sharp market decline. However, it is not clear that these same trades would necessarily be obvious reactions to the announcement *after* it has been publicly made, since an efficient market might immediately reflect the new price and volatility levels and thus quickly eliminate profit opportunities. The paper does, however, find evidence that the unusual options trading described above continued in the week after the September 11<sup>th</sup> attacks.

Trades designed to profit from a price decrease include shorting the stock, long Put option positions, short Call positions and Bear Spread positions. A reaction to expected negative news would also include selling out of stock already owned by an investor. These are all relatively straightforward examples of bearish trades. The focus of this paper will be to examine the choices made by traders in the options market. Existing literature provides some guidance on which options are most likely to be selected for the trading strategies outlined above.

A long Put position is a straightforward way to profit from a price decline. The trade will, of course, lose money in the event of a price increase, as well as losing money if there is a relatively small price decline. There is occasionally some confusion over the relative risks of buying a Put versus shorting of stock, because of the well-known P/L charts at option expiry which appear to show the long Put position benefitting from limited losses which the short position in the stock does not (See, for example, Hull [2008], page 224, Figure 10.1). It is important to note, however, that the theoretical infinite losses which can accrue to the short position in the stock are essentially a zero-probability event and that when the entire probability distribution of returns is considered it is clear that a long Put position is far riskier than a short position in the asset. Gondhalekar, Pettengill and Wingender [2011] had done a thorough job of proving this. Generally, Put option returns are large in magnitude and negative on average, as reported in Bondarenko [2003], Wilkens [2007] and related papers. However, if a trader predicts a large upcoming decrease in the price of a stock then Put options provide a high-risk, leveraged opportunity to earn large profits. McKeon [2011] shows that Put options returns can exceed

1,000% in a bear market; depending on the strike price and maturity chosen (the largest returns are for short-dated out-the-money (OTM) options).

A short Call position offers potentially positive returns to the investor who correctly predicts a large decrease in the price of a stock. However, a short Call is more complicated to implement than a long Put position as the former involves margin requirements which the latter does not. Specifically, since the short Call position creates the potential obligation to deliver the asset to the Call buyer, the trader must typically provide margin equal to 50% of the purchase price of the stock in order to demonstrate the ability to acquire the stock for deliver should that need arise (as it would upon exercise of the option by the Call buyer). However, an attraction of the short Call position is the documented large average losses to short-dated OTM Calls<sup>5</sup>. These results suggest that Call options of this moneyness and maturity are typically “expensive”, and this fact, combined with the aforementioned evidence that Put options of similar characteristics are also typically expensive might encourage traders to adopt the short position in Calls rather than the long position in Puts.

It is also possible that Call and Put positions could be a part of spread trades. A bearish spread trade involves one of the following: (i) a short position in a Put with a low strike price combined with a long position in a Put with a higher strike price; or (ii) a short position in a Call with a low strike price combined with a long position in a Call with a high strike price. The data involved in this study include flags which indicate when an option trade was part of a spread strategy of some kind<sup>6</sup>. Therefore, I am able to identify when an options trade is in isolation or a part of a more complex trading strategy.

The most straightforward example of a trade designed to profit from an expected increase in volatility is the well-known straddle. This strategy combines a long Call position with a long Put position, where the options have the same strike prices and maturity dates. Strategies which have a similar goal of profiting from increased volatility include strategies in the spirit of the straddle trade, but with either different strike prices or number of contracts between the Call and Put positions. These strategies include strips, straps and strangles. For convenience, and because trading volumes in many of the volatility trades are relatively low, I will simply use “straddle” to refer to all such volatility-based trades in the sample and include all volatility trades in this category<sup>7</sup>. Lakonishok et al. [2007] finds that volatility trades like straddles and strangles account for only a small fraction of options activity generally and this result is reflected in the Goldman data.

### Data

Data on trades and quotes for options on Goldman Sachs are from Tickdata. The data on trades includes the time of the trade, the exchange on which the trade took place, the price at which the

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<sup>5</sup>See Constantinides, Jackwerth and Savov [2013], Ni [2009], McKeon [2013] and Wilkens [2007].

<sup>6</sup>“Spread” is a general term, and setup of this strategy can involve calendar, vertical, horizontal or diagonal spreads.

<sup>7</sup>Note that spread trades are not included in this category, although Chaput and Ederington [2005] notes that spreads may be constructed to be volatility trades (low-delta, high-vega).

trade was concluded, and a condition code which flags trades which were components of spreads, straddles, covered calls, protective puts or combination trades. The condition code also flags trades which are reported out of sequence or cancelled<sup>8</sup>. Credit default swap (CDS) and stock price data is obtained from Datastream.

One limitation of the options trade data is the inability to distinguish opening trades from closing trades. This could potentially lead to confusion in interpreting results. For example, volume of trading in certain contracts expiring on April 16<sup>th</sup> 2010 was high during the final hour of trading, which may seem strange until one considers that this trading volume likely represents closing of existing positions which traders don't want to have to exercise<sup>9</sup>. Unfortunately, trades cannot be directly observed as opening or closing trades in the data. However, Table 1 provides information on the change in open interest on option contracts for April 16<sup>th</sup> 2010. This data makes it clear that the vast majority of trading on Goldman Sachs option contracts during April 16<sup>th</sup> was in the form of opening trades rather than closing trades. As noted in Table 1, the average option contract on Goldman Sachs saw its open interest increase by approximately 504 contracts on April 16<sup>th</sup>, and only 37 of the 334 available option contracts saw their open interest decline on that date. Therefore, although we cannot flag any specific trades as opening or closing with certainty, we can note that generally the trading was overwhelmingly in the form of opening positions.

**Table 1: Summary of Changes in Open Interest**

This table reports the summary statistics for the change in open interest on all Goldman options contracts on April 16<sup>th</sup> 2010, excluding the contracts expiring that same day. N is the total number of option contracts available on Goldman stock, including Calls and Puts of all strike prices and expiry dates, Mean is the average change in open interest of an option contract on Goldman stock,  $\sigma$  is the cross-sectional standard deviation in change in open interest, Max and Min are the largest increase and largest decrease in open interest recorded for any option contract, #(-) and %(-) are the number of option contracts and percentage of all contracts which registered a decrease in open interest, and Volume is the total number of option contracts on Goldman traded on April 16<sup>th</sup> 2010.

N	334
Mean	504.21
$\sigma$	1,578.09
Max	11,389
Min	-1,206
#(-)	37
%(-)	11.08%
Volume	319,762

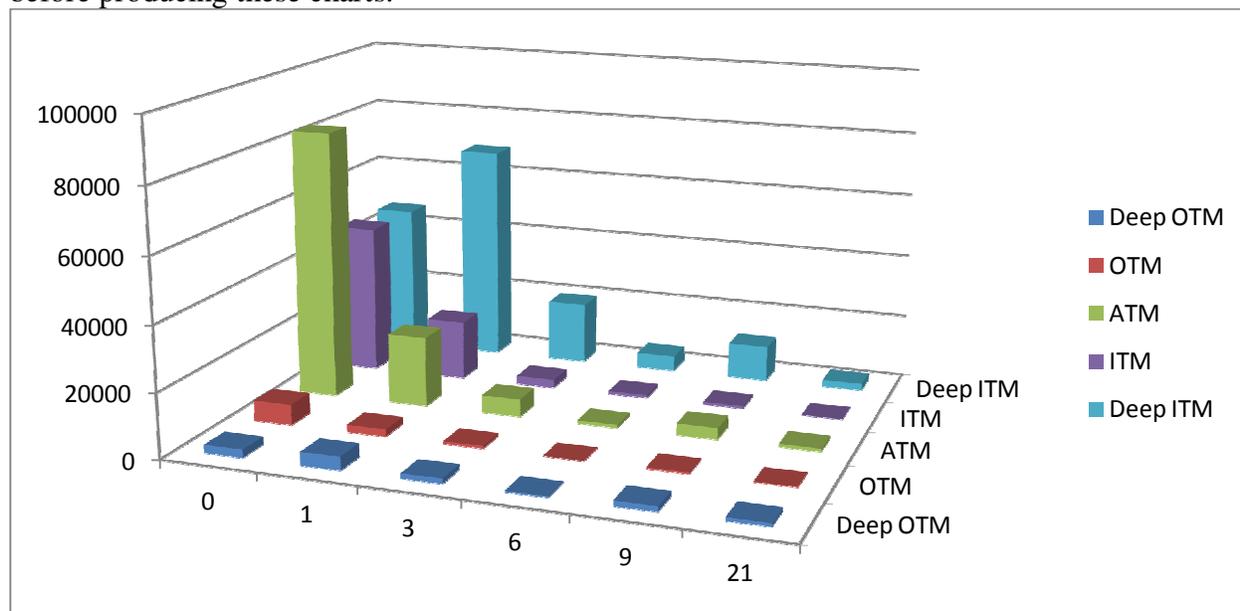
<sup>8</sup>Cancelations are common and to be expected with quotes data, but somewhat surprising to find in trades data. After consultation with the data provider these appear to be corrections of details to previously reported trades. In any event, the number of trades flagged in this manner is a comparatively small 35 trades.

<sup>9</sup>This volume could also theoretically be late reporting of earlier trades, although I rule this out since late reported trades are flagged as such and therefore easy to identify as out of sequence on the data.

A final limitation of the data is the inability to see the type of trader responsible for initiating the trade. Therefore, to the extent that trading from retail clients has a different significance to trading from institutions, for example, the analysis here cannot shed light on that. The possibility also exists that programmed or algorithmic trading may be possible for some of the orders placed in the data. This possibility is strengthened by the incredible speed with which orders responded to the SEC announcement. However, the possibility of trades being initiated by algorithms would not invalidate the results or interpretation for the purposes of this research, since we can assume that the algorithms themselves have been set to trade based on certain rules which then still reflect how those traders respond to specific market events or conditions.

**Trading on April 16<sup>th</sup>, 2010**  
**Calls**

Figure 3 summarizes the trading in Call options during the day. The sample of Call option trades analyzed here is restricted to those Calls which were traded in isolation. In other words, all trades flagged as part of spreads, buy-writes or straddle strategies are eliminated from the sample before producing these charts.



**Figure 3: Call Option Trading**

This chart shows the volume of contracts traded in Calls on Goldman stock on April 16<sup>th</sup> 2010. The volume is reported by moneyness and number of months remaining to expiry (where the April 2010 contracts have 0 months).  $Moneyness = (X - S_0) / S_0$ , where X is the strike price of the Call option and  $S_0$  is the price of Goldman Sachs stock as determined by  $(Bid_0 + Ask_0) / 2$  where  $Bid_0$  is the quoted Bid for Goldman stock at the time of the Call trade and  $Ask_0$  is the quoted Ask. “Deep ITM” refers to Calls where  $moneyness < -0.05$ , “ITM” refers to Calls where  $-0.05 \leq moneyness < -0.025$ , “ATM” refers to Calls where  $-0.025 \leq moneyness < 0.025$ , “OTM” refers to Calls where  $0.025 \leq moneyness < 0.05$  and “Deep OTM” refers to Calls where  $moneyness > 0.05$ .

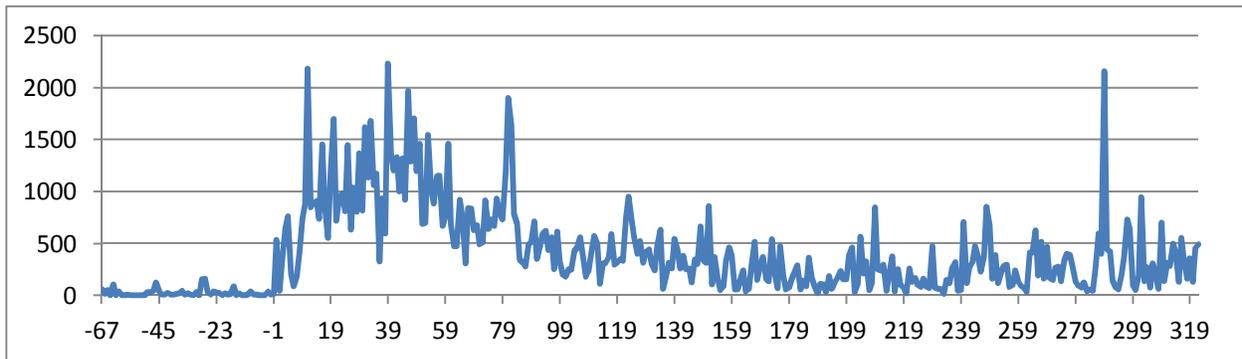
Figure 3 indicates that trading in Call options was mostly in short-dated contracts. However, this is generally true and not a fact confined to this particular date or company. Short-dated options

generally have higher expected returns than longer-dated options. The duration of the contract is reported as the number of months remaining until expiry. Therefore, the time to maturity of the options due to expire that very day on April 16<sup>th</sup> 2010 is reported as zero, with May 2010 Goldman options having a time to maturity of 1 and so on.

The results also report the differences in trading volumes by moneyness. The classification of how far in- or OTM the options are is made possible by the fact that the options trade data includes the latest bid and ask quotes for the underlying asset at the time of an option trade. I use the midpoint of the bid-ask quote for Goldman stock at the time of any option trade to determine the moneyness as:

$$\text{moneyness} = (X - S_0) / S_0 \quad (2)$$

where  $X$  is the strike price of the Call option and  $S_0$  is the price of Goldman Sachs stock as determined by  $(\text{Bid}_0 + \text{Ask}_0) / 2$  where  $\text{Bid}_0$  is the quoted Bid for Goldman stock at the time of the Call trade and  $\text{Ask}_0$  is the quoted Ask. The moneyness classification reported is then based on this ratio, where “Deep ITM” refers to Calls where moneyness  $< -0.05$ , “ITM” refers to Calls where  $-0.05 \leq \text{moneyness} < -0.025$ , “ATM” refers to Calls where  $-0.025 \leq \text{moneyness} < 0.025$ , “OTM” refers to Calls where  $0.025 \leq \text{moneyness} < 0.05$  and “Deep OTM” refers to Calls where moneyness  $> 0.05$ . The classification of moneyness for Puts follows similar lines later in the paper<sup>10</sup>.



**Figure 4: Deep ITM Call Trading over the Day**

This chart shows the volume of trading in Deep in-the-money (ITM) Call options on Goldman during the day of April 16<sup>th</sup> 2010. The X-axis is the time of the trades in minutes relative to the SEC announcement, and trading volumes are aggregated if there is more than one trade with the same time stamp. Calls are classified as Deep ITM if the ratio  $(X - S_0) / S_0$  is less than  $-0.05$  (see Figure 3 for more details).

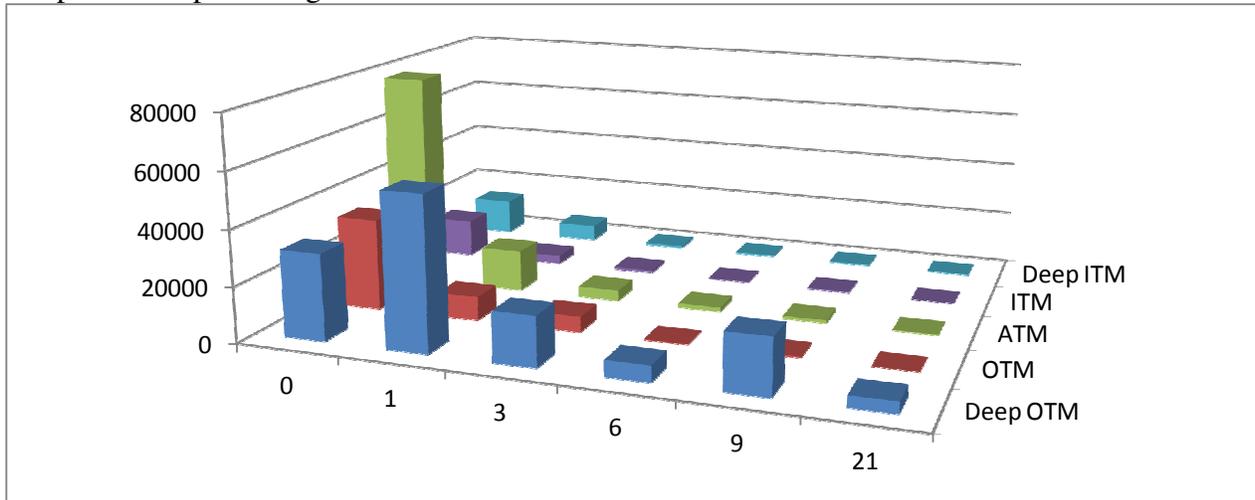
Furthermore, trading in in-the-money (ITM) Calls was significant, indicating some contrarian activity on the part of options traders as the market price of Goldman Sachs declined. Figure 4 confirms this, clearly showing that most of the activity in ITM options took place after the SEC's announcement. It is interesting that traders preferred ITM Calls to OTM Calls, as OTM Calls

<sup>10</sup>The moneyness classification for Puts simply reverses the classification: “Deep OTM” refers to Puts where moneyness  $< -0.05$ , “OTM” refers to Puts where  $-0.05 \leq \text{moneyness} < -0.025$ , “ATM” refers to Putss where  $-0.025 \leq \text{moneyness} < 0.025$ , “ITM” refers to Puts where  $0.025 \leq \text{moneyness} < 0.05$  and “Deep ITM” refers to Puts where moneyness  $> 0.05$ .

have higher leverage and therefore would offer the greater payoff if the price of Goldman did rebound significantly in the short term. Figure 3 confirms that OTM Calls were avoided by traders, with deep ITM and at-the-money (ATM) Calls being strongly preferred.

**Puts**

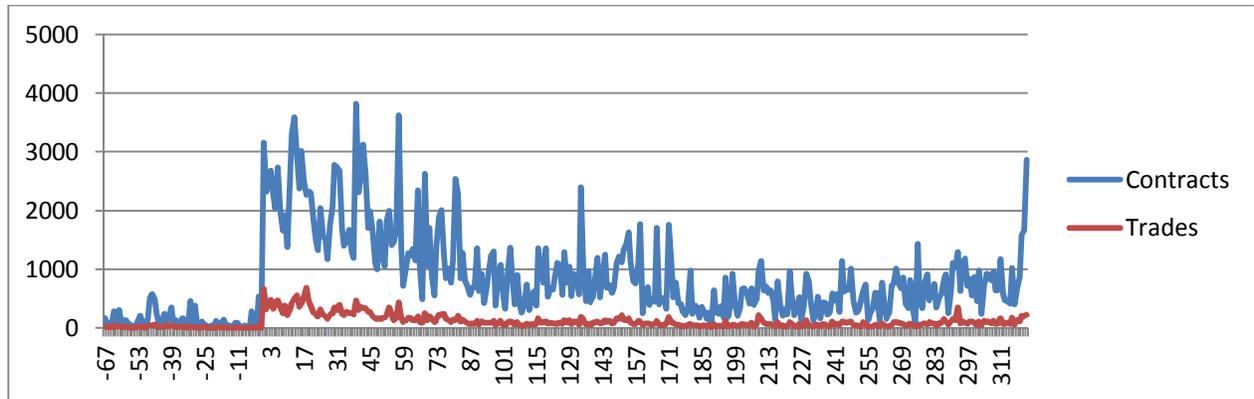
Figure 5 summarizes the trading in Put options during the day. The sample of Put option trades analyzed here is restricted to those trades which were traded in isolation. In other words, all trades flagged as part of spreads, protective puts or straddle strategies are eliminated from the sample before producing these charts.



**Figure 5: Put Option Trading**

This chart shows the volume of contracts traded in Puts on Goldman stock on April 16<sup>th</sup> 2010. The volume is reported by moneyness and number of months remaining to expiry (where the April 2010 contracts have 0 months).  $\text{Moneyness} = (X - S_0) / S_0$ , where X is the strike price of the Put option and  $S_0$  is the price of Goldman Sachs stock as determined by  $(\text{Bid}_0 + \text{Ask}_0) / 2$  where  $\text{Bid}_0$  is the quoted Bid for Goldman stock at the time of the Put trade and  $\text{Ask}_0$  is the quoted Ask. “Deep OTM” refers to Puts where  $\text{moneyness} < -0.05$ , “OTM” refers to Puts where  $-0.05 \leq \text{moneyness} < -0.025$ , “ATM” refers to Puts where  $-0.025 \leq \text{moneyness} < 0.025$ , “ITM” refers to Puts where  $0.025 \leq \text{moneyness} < 0.05$  and “Deep ITM” refers to Puts where  $\text{moneyness} > 0.05$ .

Figure 5 indicates that trading in Put options was mostly in short-dated contracts. However, there is greater volume of trading in longer-dated contracts than was the case for Call options. While the volume of trading in Call options suggested some contrarian trading in ITM Calls, the volume in Put contracts clearly suggests traders trying to take advantage of a short-term decline in the price of Goldman shares. Traders invested in short-term at- and out-the-money Puts, clearly in an attempt to profit from a leveraged short-term, bearish strategy. This is interesting, as this trading all occurred *after* the SEC’s announcement, and so this trading activity indicates that many traders thought that the market did not initially fully respond to the announcement and that the stock price decline would continue for some time thereafter.



**Figure 6: Put Option Trading over the Day**

This chart shows the volume of trading in all Put options on Goldman during the day of April 16<sup>th</sup> 2010. The X-axis is the number of minutes before/after the announcement, and trading volumes and number of trades are aggregated if there is more than one trade within that minute interval.

Figure 6 confirms that the bulk of Put option trading took place following the SEC's announcement. The significant volume of trading in contracts which were expiring that very day on April 16<sup>th</sup> (see time 0 in Figure 5) suggests that many traders expected the negative market reaction to continue during the day, and in fact this is exactly what happened.

Table 2 reports results for the Dollar volume of trading in April Put options, along with the profitability of the trades. The returns statistics reported illustrate the opportunity that was available to traders to profit from the announcement by the SEC and the subsequent decrease in Goldman's stock price. It is important to note that this is not a purely theoretical opportunity – this is based on prices of actual recorded trades.

Dollar volume of trading is based on the number of contracts traded, the contract size and the reported transaction price of the trade, specifically:

$$\text{Dollars} = P_0 \times N \times 100 \tag{3}$$

where  $P_0$  is the Put premium recorded at the time of the trade,  $N$  is the number of contracts traded and 100 is the number of shares which each option contract relates to (contract size). This provides an indication of the economic interest in Put options on this day.

**Table 2: April 2010 Put Options Trades Profitability Summary**

This table reports the Dollar investment in April Puts on Goldman on April 16<sup>th</sup> 2010:

$$\text{Dollars} = P_0 \times N \times 100,$$

where  $P_0$  is the Put premium recorded in the trade,  $N$  is the number of contracts traded and 100 is the number of shares which each option contract relates to (contract size).

Return statistics for Puts are based on  $R_P = (P_T - P_0)/P_0$ , where  $R_P$  is the return on the Put option,  $P_T$  is the intrinsic value of the Put at expiry (at the end of the day) based on  $\text{MAX}(0, X - S_T)$ , where  $X$  is the Put strike price and  $S_T$  the closing price of Goldman stock of \$160.70, and  $P_0$  is the recorded Put premium for each trade registered during the day. Average Return,  $\sigma$ ,

Skewness, Kurtosis, Min and Max report the mean, standard deviation, skewness, kurtosis, maximum and minimum values of the cross-section of returns respectively.

	<u>April Puts</u>
Dollar Investment	\$42,479,289
Dollar Investment in Puts Expiring Worthless	\$ 8,917,065
Average Return	561.79%
$\sigma$	5,079.59%
Skewness	15.91
Kurtosis	311.80
Min	-100.00%
Max	142,900.00%

The results show that the total Dollar amount of trading in April Put options on April 16<sup>th</sup> 2010 was \$42,479,289. A notable \$8,917,065 was invested in options which expired worthless. However, this does not mean that investors actually held the options until the end of the day when they expired worthless. It is possible that some positions in these options were closed before the end of the day.

I report returns statistics for April Put options in Table 2. The returns statistics are based on the assumption that April Put options were held to the end of the day. The actual recorded trading price and the final intrinsic value at the close of the day serve as the initial investment and final payout. Specifically, the return is:

$$R_P = (P_T - P_0) / P_0 \quad (4)$$

where  $R_P$  is the return on the Put option,  $P_T$  is the intrinsic value of the Put at expiry (at the end of the day) based on  $\text{MAX}(0, X - S_T)$  where  $X$  is the Put strike price and  $S_T$  the closing price of Goldman stock of \$160.70, and  $P_0$  is the recorded Put premium for each trade registered during the day. This equation, therefore, gives us a general picture of the profitability of various April Put options during the day *based on the actual prices at the time these options were actually traded*. Table 2 shows that trading in April Put options was generally highly profitable on April 16<sup>th</sup> 2010, despite the fact that a significant volume of trading flowed into OTM Puts which expired out-the-money for a 100% loss. Specifically, average returns were 561.79%, a substantial return on investment for traders.

The reader may be forgiven for thinking that the highest return reported in Table 2 of 142,900% is a typographical error! However, this is indeed a correct figure, resulting from traders buying up April-\$175 Put options on Goldman for \$0.01 that then expired in-the-money by \$14.30. There were three trades recorded in these contracts at this price within the first minute following the SEC announcement, with total trading volume of 18 contracts. The wealth transfer from sellers to buyers of these contracts was, therefore, \$25,722 just based on these three trades recorded in the minute after the announcement ( $[18 \times 100 \times \$14.30] - [18 \times 100 \times \$0.01]$ ).

Table 3 breaks this profitability down further by individual option contract, and Figure 7 further analyzes the profitability of certain select Put options by minute surrounding the event in order to provide evidence on how long after the SEC's announcement trading in Put options remained profitable. Table 3 details the volume of trading and profitability of the individual April Put contracts, and this clearly shows that a significant volume of trading was in options which delivered a return of -100%. However, huge gains were on offer to investors who traded OTM Puts which later expired ITM following the huge decline in Goldman's stock price. There was significant trading in Puts with strike prices from 165 to 180, and the evidence suggests this trading was extremely profitable for those investors who moved quickly to establish these positions.

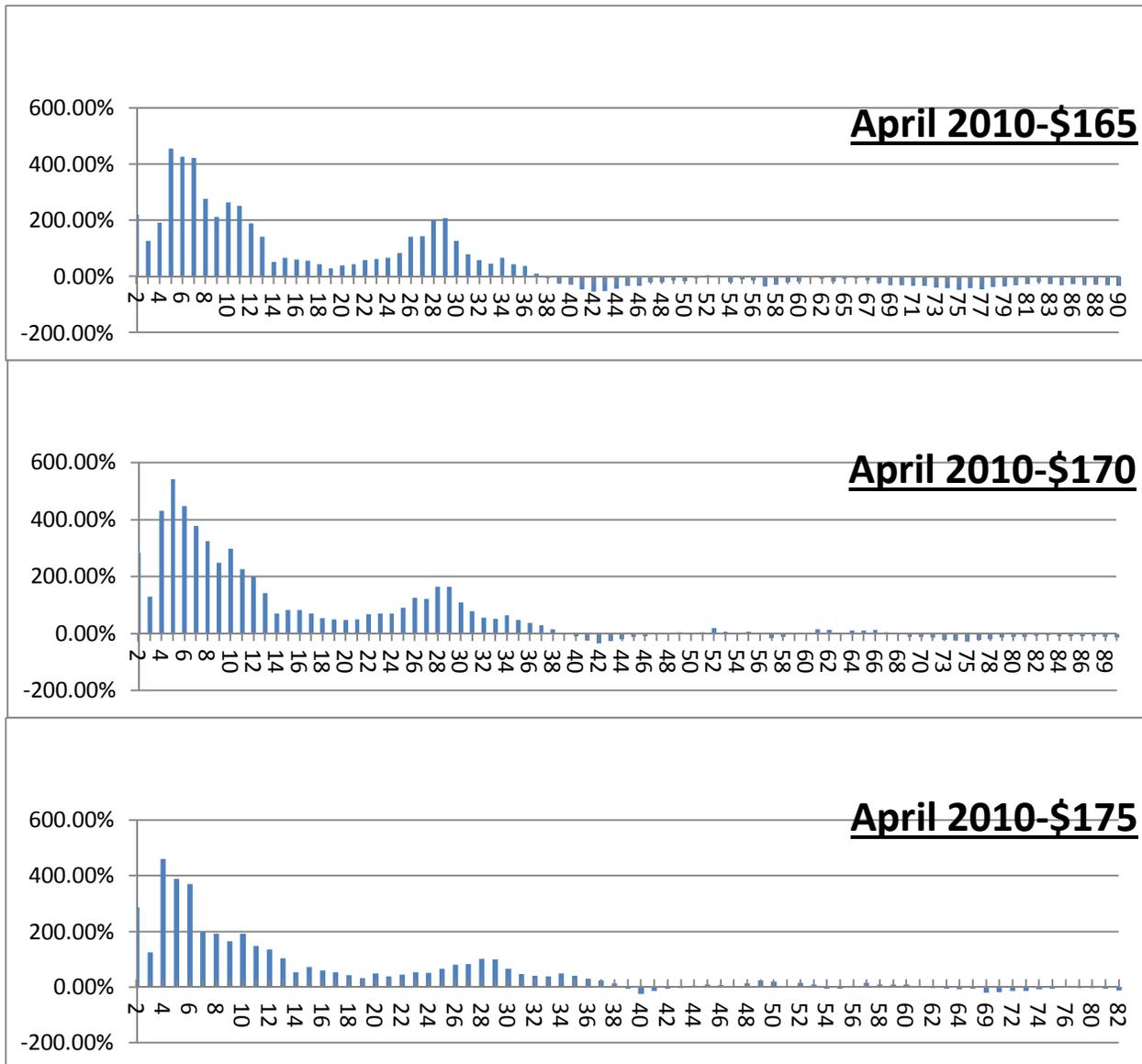
**Table 3: April 2010 Put Options Profitability by Moneyness**

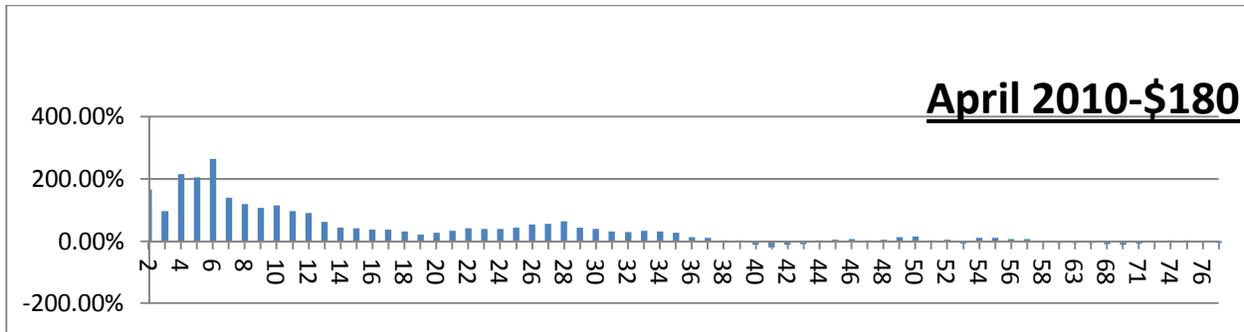
This table reports the average return on April 16<sup>th</sup> 2010 for April-2010 Put options traded on Goldman that day. The results are reported by strike price of the option contract, with the number of trades in each contract included. Average Return is the equally-weighted average of  $R_P = (P_T - P_0)/P_0$ , where  $R_P$  is the return on the Put option,  $P_T$  is the intrinsic value of the Put at expiry (at the end of the day) based on  $\text{MAX}(0, X - S_T)$  where  $X$  is the Put strike price and  $S_T$  the closing price of Goldman stock of \$160.70, and  $P_0$  is the recorded Put premium for each trade registered during the day.

Strike price	Number of trades	Average Return
115	2	-100.00%
120	5	-100.00%
125	25	-100.00%
130	27	-100.00%
135	82	-100.00%
140	339	-100.00%
145	342	-100.00%
150	1,318	-100.00%
155	3,053	-100.00%
160	7,439	-100.00%
165	4,880	99.62%
170	2,944	1,174.40%
175	1,952	2,645.54%
180	2,464	2,557.95%
185	506	391.04%
190	147	119.53%
195	19	73.26%
200	21	68.30%
210	1	-4.55%
220	1	20.16%
280	4	5.21%

Figure 7 shows the profitability of the April-165, April-170, April-175 and April-180 Puts in the minutes following the SEC's announcement, once again based on actual trade prices and assuming that the positions were held to the end of the day. An example of the calculations that

would go into this figure are as follows: in the minute after the SEC announcement, 2 contracts of the April expiry, \$170-strike put options were opened. The trade was concluded at a price of \$0.01. When the price of Goldman stock closed at the end of the day at \$160.70 this resulted in the contract expiring in-the-money by \$9.30. Therefore, the return for this trade is recorded as  $(\$9.30 - \$0.01) / (\$0.01) = 92,900\%$ . This result is then added to those for all trades recorded 1 minute after the SEC announcement, and weighted relative to all other trades by the volume of 2 contracts. In this way, I construct a volume-weighted expected return for each minute of trading following the SEC announcement.





**Figure 7: Intra-Day Profitability of April 2010 Puts**

This chart shows the profitability during the day of various April 2010 Put option contracts on Goldman stock. The X-axis is the number of minutes since the SEC's announcement. The returns reported are based on actual trading prices recorded at the exact times indicated and based on the assumption that those positions were then held to expiry at the end of the day (See Equation 4 for more details).

These graphics suggest that these Puts were a highly profitable investment for at least 35 minutes following the SEC's announcement. This represents a relatively long time for the market to adjust to the bad news and eliminate abnormal return opportunities. Since Put options are a hedging instrument with negative expected returns, any positive profits are noteworthy.

**Straddles**

Table 4 includes results for the total Dollars committed to straddle trading, along with the returns statistics for straddles in April option contracts. Dollar volume of trading is based on the number of contracts traded, the contract size and the reported transaction price of the trade, specifically:

$$\text{Dollars} = (P_0 \times N \times 100) + (C_0 \times N \times 100) \tag{5}$$

where  $P_0$  is the Put premium recorded in the trade,  $C_0$  is the Call premium recorded in the trade,  $N$  is the number of contracts traded and 100 is the number of shares which each option contract relates to (contract size). Because trades are not divided into opening and closing trades we must exercise caution in interpreting this number as the actual amount of money invested in straddles on the event date. However, it does provide some indication of the economic interest in straddles on this day. I match up Calls and Puts in the data by finding options flagged as straddle trades which are time-stamped within 5 seconds of each other (in fact, these trades typically have the same time stamp).

The results show that the total Dollar amount of trading in straddles on April 16<sup>th</sup> 2010 was \$5,938,074. I also report returns statistics for straddles using April options contracts in Table 4. The returns statistics are based on the hypothetical exercise of buying and holding the straddles, with the actual recorded trading price and the final intrinsic value at the close of the day serving as the initial investment and final payout. Specifically, the return is:

$$R_{St} = (P_T + C_T - P_0 - C_0) / (P_0 + C_0) \tag{6}$$

where  $R_{St}$  is the return on the straddle,  $P_T$  is the intrinsic value of the Put at expiry (at the end of the day) based on  $\text{MAX}(0, X - S_T)$  where  $X$  is the Put strike price and  $S_T$  the closing price of Goldman stock of \$160.70,  $C_T$  is the intrinsic value of the Call at expiry (at the end of the day)

based on  $\text{MAX}(0, S_T - X)$ , and  $P_0$  and  $C_0$  are the recorded Put and Call premia for each trade registered during the day.

The results suggest that volatility trades in Goldman options were not in fact very profitable on April 16<sup>th</sup> 2010. In unreported results I do find some specific trades that appeared to be highly profitable, but these are in the minority.

**Table 4: Straddle Trades Profitability Summary**

This table reports the Dollar investment in straddle trades on April 16<sup>th</sup> 2010:

$$\text{Dollars} = P_0 \times N \times 100 + C_0 \times N \times 100,$$

where  $P_0$  is the Put premium recorded in the trade,  $C_0$  is the Call premium recorded in the trade,  $N$  is the number of contracts traded and 100 is the number of shares which each option contract relates to (contract size).

Return statistics for straddles are based on  $R_{St} = (P_T + C_T - P_0 - C_0) / (P_0 + C_0)$ , where  $R_{St}$  is the return on the straddle,  $P_T$  is the intrinsic value of the Put at expiry (at the end of the day) based on  $\text{MAX}(0, X - S_T)$  where  $X$  is the Put strike price and  $S_T$  the closing price of Goldman stock of \$160.70,  $C_T$  is the intrinsic value of the Call at expiry (at the end of the day) based on  $\text{MAX}(0, S_T - X)$ , and  $P_0$  and  $C_0$  are the recorded Put and Call premia for each trade registered during the day. Average Return,  $\sigma$ , Skewness, Kurtosis, Min and Max report the mean, standard deviation, skewness, kurtosis, maximum and minimum values of the cross-section of returns respectively.

	<u>April Straddles</u>
Dollar Investment	\$5,938,074*
Average Return	-24.96%
$\sigma$	143.85%
Skewness	6.57
Kurtosis	47.09
Min	-89.83%
Max	1,231.03%

(\*In contrast with the other numbers for straddles, this number is for *all* straddle trades, not just those using April contracts.)

The average return generated in the above analysis is -24.96%, suggesting that volatility trades were a losing proposition for the most part. I do not analyze the profitability of straddles by minute after the SEC's announcement because the volume of trading is too thin most of the time to provide any meaningful minute-by-minute breakdown. However, unreported results do indicate that the reason straddles were not profitable is because trading in those strategies started relatively late after the announcement. This is interesting given that straddles might be thought of as a strategy to be used by sophisticated investors. In this case, however, it appears that straddle traders were slower to respond to market events than traders of simpler long option positions.

**Trading after April 16<sup>th</sup>**

Trading at the start of the week following the SEC's announcement, on Monday 19<sup>th</sup> April, provides further insight into the demand for investment insurance. I focus on put options with June expiry, since these options all registered open interest of 0 following trading on Friday

April 16<sup>th</sup>. Therefore, we know with certainty that all trading on these contracts starting Monday 19<sup>th</sup> was opening new positions in the contracts.

Table 5 summarizes the demand for positions in these June contracts. The results confirm significant economic interest in June put options on Goldman following the dramatic announcement by the SEC at the end of the previous week. The dollar investment in June put option contracts was \$5,390,436.

**Table 5: June 2010 Put Options Trades Profitability Summary**

This table reports the Dollar investment in June expiry Puts on Goldman on April 19<sup>th</sup> 2010, and the return statistics based on the actual reported price and the subsequent closing value of the option. Dollars =  $P_0 \times N \times 100$ , where  $P_0$  is the reported put premium, N the number of contracts traded, and 100 the contract size of 100 shares. Return statistics for Puts are based on  $R_p = (P_T - P_0)/P_0$ , where  $R_p$  is put return,  $P_0$  the reported put premium, and  $P_T$  the closing price of the put.

	<u>June Puts</u>
Dollar Investment	\$5,390,436
P/L based on April 19 <sup>th</sup> mark-to-market	-\$893,324
Percentage return	-16.57%
P/L based on June 18 <sup>th</sup> (June expiry) mark-to-market	\$4,634,033
<u>Percentage return</u>	<u>85.97%</u>

How effective or profitable was this trading in put options which took place on Monday April 19<sup>th</sup>? I perform two different calculations to provide evidence on this question. I calculate the total return on all June put option contracts traded on April 19<sup>th</sup> by marking the contracts to market at the end of two different days: the first day they were traded, April 19<sup>th</sup>, and the expiry date of the options, June 18<sup>th</sup>.

The first mark-to-market, which reports the profit/loss at the end of the first day of trading in these option contracts on April 19<sup>th</sup>, shows that the day ended with buyers of the option sitting on an unrealized loss of -\$893,324. This represents a return for the day of -16.57% based on the purchase prices of the options. However, a longer time horizon shows that buyers of put options ended up with significantly profitable positions. The mark-to-market on the expiry date of the contracts, June 18<sup>th</sup>, reveals that had the contracts been held from April 19<sup>th</sup> all the way to expiry the profit would have been \$4,634,033. This represents a return of 85.97% based on the original purchase price of the options.

Did investors in fact hold these positions all the way to expiry and realize this impressive gain? The data does not allow for tracking the performance of individual investors, but the open interest data does reveal that the economic interest in these put option contracts never declined below the initial number of contracts traded, and in fact increased over time between April 19<sup>th</sup> and June 18<sup>th</sup>. Therefore, we can conclude more generally that there was a transfer of wealth from put option sellers to put option buyers of more than \$4.5 million over this two-month timeframe.

### Determinants of Trading After April 16th

The previous section reported results for the trading activity on the day of the SEC announcement, April 16<sup>th</sup>, 2010. This section describes the continued trading activity over time in the weeks following the announcement. I follow the variation in trading activity over time up to the resolution of the issue which came when Goldman paid a fine to the SEC on July 16<sup>th</sup>, 2010. The intention of this section is to contribute to our understanding of the factors that drive changes in trading activity, specifically with regards to the options market and options trading strategies. The specific factors I consider which might motivate trading activity are those related to the price movements of Goldman stock, along with changes in perception of price volatility.

Since this paper is a case study of one specific firm, the scope of the analysis cannot extend to an enquiry on cross-sectional firm-specific factors which motivate options trading, which could potentially include factors such as book-to-market ratio, size etc. While this is a limitation of the study in one sense, on the other hand the analysis of a single company allows the company to act as its own control for these firm-specific factors, which do not change significantly over the relatively short time period being considered here.

Table 6 reports the results for the regression analysis of the determinants of trading in various options strategies over the April 19<sup>th</sup> to July 15<sup>th</sup> 2010 period. The results are based on estimating the following regression:

$$\Delta \text{VOLUME}_{(t)} = \alpha + \beta_{(IV,t)}[\text{IV}_{(t)}] + \beta_{(VOL,t)}[\text{VOLUME}_{(t)}] + \beta_{(Ret,t)}[\text{RET}_{(t)}] + \beta_{(CDS)}[\Delta \text{CDS}_{(t)}] + \beta_{(TOTVOL,t)}[\text{TOTALVOLUME}_{(t)}] + \beta_{(POS,t)}[\text{POSITIVE}_{(t)}] + \beta_{(NEG,t)}[\text{NEGATIVE}_{(t)}] + \varepsilon_{(t)} \quad (7)$$

where  $\Delta \text{VOLUME}_{(t)}$  is the change in the daily volume of trading in the specific strategy from time t-1 to t,  $\text{IV}_{(t)}$  is the implied volatility of Goldman recorded at time t (implied volatility is the arithmetic average of implied volatilities reported for all one-month options where the strike price was within 5% of the Goldman share price),  $\text{VOLUME}_{(t)}$  is the volume of trading in the specific trading strategy at time t,  $\text{RET}_{(t)}$  is the return on Goldman stock as calculated by the difference between closing price from time t-1 to t,  $\Delta \text{CDS}_{(t)}$  is the change in the 5-year credit default swap spread on Goldman as calculated by the difference between closing spreads from time t-1 to t,  $\text{TOTALVOLUME}_{(t)}$  is the volume of trading in *all options trading* on Goldman at time t,  $\text{POSITIVE}_{(t)}$  is a binary variable which takes the value of 1 if the return in time t was above the 90<sup>th</sup> percentile for returns of the period, and  $\text{NEGATIVE}_{(t)}$  is a binary variable which takes the value of 1 if the return in time t was below the 10<sup>th</sup> percentile for returns of the period.  $\alpha$ ,  $\beta_{(IV,t)}$ ,  $\beta_{(VOL,t)}$ ,  $\beta_{(Ret,t)}$ ,  $\beta_{(CDS)}$ ,  $\beta_{(TOTVOL,t)}$ ,  $\beta_{(POS,t)}$  and  $\beta_{(NEG,t)}$  are coefficients to be estimated. The lagged explanatory variables are most important to the analysis, as separating cause and effect in the contemporaneous data may be difficult.

The regression results indicate that trading in individual Call or Put trades was positively related to lagged stock returns, with positive returns prompting both greater Call and Put volume the following day. In particular, large positive returns shocks – defined as returns above the 90<sup>th</sup> percentile of returns over the period - prompted higher volumes of individual Call and Put trading the following day. It is interesting to note that the direction of the stock price prompted the same direction of changes in volume of trading in Calls and Puts.

By contrast, trading in straddles and spread trades was negatively related to lagged stock returns. Interestingly, lagged implied volatility was not a significant determinant of straddle trading. However, trading in individual Call and Put contracts was negatively related to lagged implied volatility, consistent with traders being less active in the options market when individual options were perceived as expensive.

**Table 6: Determinants of Trading Volume in Various Options Strategies over the April 19<sup>th</sup> to July 16<sup>th</sup> 2010 Period**

The results are based on estimating the following regression:

$$\Delta\text{VOLUME}_{(t)} = \alpha + \beta_{(IV,t)}[IV_{(t)}] + \beta_{(VOL,t)}[\text{VOLUME}_{(t)}] + \beta_{(RET,t)}[RET_{(t)}] + \beta_{(CDS,t)}[\Delta\text{CDS}_{(t)}] + \beta_{(TOTVOL,t)}[\text{TOTALVOLUME}_{(t)}] + \beta_{(POS,t)}[\text{POSITIVE}_{(t)}] + \beta_{(NEG,t)}[\text{NEGATIVE}_{(t)}] + \varepsilon_{(t)}$$

where  $\Delta\text{VOLUME}_{(t)}$  is the change in the volume of trading in the specific strategy from time t-1 to t,  $IV_{(t)}$  is the implied volatility of Goldman recorded at time t (and explained further below),  $\text{VOLUME}_{(t)}$  is the volume of trading in the specific trading strategy at time t,  $RET_{(t)}$  is the return on Goldman stock as calculated by the difference between closing price from time t-1 to t,  $\Delta\text{CDS}_{(t)}$  is the change in the 5-year credit default swap spread on Goldman as calculated by the difference between closing spreads from time t-1 to t,  $\text{TOTALVOLUME}_{(t)}$  is the volume of trading in *all options trading* at time t,  $\text{POSITIVE}_{(t)}$  is a binary variable which takes the value of 1 if the return in time t was above the 90<sup>th</sup> percentile for returns of the period, and  $\text{NEGATIVE}_{(t)}$  is a binary variable which takes the value of 1 if the return in time t was below the 10<sup>th</sup> percentile for returns of the period. \*, \*\* or \*\*\* indicate that the estimated coefficient is statistically significant at the 10%, 5% and 1% levels respectively.

	Calls	Puts	Straddles	Call Spreads	Put Spreads
Adj R <sup>2</sup>	0.89	0.83	0.70	0.70	0.69
N	72	72	72	72	72
$\alpha$	0.39	0.59	1.08*	1.01	0.98
$IV_{(t)}$	2.58*	2.03	-4.94**	-5.65**	-6.20**
$IV_{(t-1)}$	-4.24***	-5.06**	2.17	2.96	3.78
$\text{VOLUME}_{(t-1)}$	0.00	-0.00	-0.01***	-0.01***	-0.02***
$RET_{(t-1)}$	13.09***	22.82***	-16.57**	-14.36**	-17.90**
$RET_{(t)}$	7.30**	-11.93*	-13.16*	-12.28*	-13.46*
$\Delta\text{CDS}_{(t)}$	-0.75	-2.20*	-1.50	-1.30	-1.27
$\text{TOTALVOLUME}_{(t)}$	0.00***	0.00***	0.00***	0.00***	0.00***
$\text{TOTALVOLUME}_{(t-1)}$	0.00	0.00	0.00	0.00	0.00*
$\text{POSITIVE}_{(t-1)}$	0.63***	0.85**	-0.11	-0.11	-0.02
$\text{NEGATIVE}_{(t-1)}$	-0.60**	-0.66	-0.89*	-0.91*	-0.97*

## Conclusion

On the 16<sup>th</sup> of April 2010 the Securities and Exchange Commission (SEC) brought charges against Goldman, Sachs & Co for alleged fraudulent dealings. Shares of the company, trading under ticker GS, ended the day at a price of \$160.70 after opening the day that morning at \$183.62 and reaching a low point on the day of \$155.55. The news of the SEC's decision was

delivered publicly for the first time at 10:36:51 a.m. Eastern Standard Time, as recorded by Bloomberg newswire. The purpose of this paper was to study the actions which options market participants took in response to this dramatic negative news announcement with specific focus on the choices investors made amongst the range of strategies available to them.

Taken together, the results indicate quite clearly that the dramatic announcement regarding Goldman inspired a considerable amount of trading in a variety of different options strategies. Traders gravitated towards products or strategies which provided a leveraged bet on the direction of the stock price - including both bearish and bullish trading - and traders also rushed to implement volatility trades. Evidence suggests that bearish directional trading on the price was highly profitable for at least 30 minutes after the announcement. The evidence indicates that volatility trades around the event were unprofitable.

An analysis of the trading activity in the weeks following the announcement sheds some light on the factors which drive changes in trading activity in various options trading strategies during times of crisis. Specifically, strong performance by the stock motivated increased trading in Calls and Puts, while reducing trading activity in straddles and all types of spread trades. It is noteworthy that the direction of stock price movement prompted similar changes in volumes of trading for both Calls and Puts.

Interestingly, lagged implied volatility was not a significant determinant of straddle trading. However, trading in individual Call and Put contracts was negatively related to lagged implied volatility, consistent with traders being less active in the options market when individual options were perceived as expensive.

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## Audit Committee Effectiveness: Evidence from an Emerging Market Economy

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### Abstract

This paper examines the effectiveness of corporate governance in an emerging market economy, especially the role of audit committees in Saudi corporations from the perspective of audit committee members. Using a hybrid methodology that combines archival data of annual reports and survey data from audit committee members in 91 firms listed on the Saudi Arabian Capital Market Authority (SACMA) in 2011, we find that audit committee members are consistently more focused on performing selected general assigned and voluntary duties and less actively engaged in the mandatory oversight responsibilities over internal control and the quality of financial reporting process. The findings from this study suggest that there is an urgent need for continuing to develop audit standards and accounting regulations that are legally enforceable and easier to understand by the audit community in Saudi Arabia.

**Keywords:** Corporate Governance, Audit Committees Effectiveness, Emerging Market Economy, Saudi Arabia

### I. Introduction

The issue of corporate governance and its effectiveness has been subjected to intense scrutiny in the wake of the recent global financial crisis and economic recession. Although the majority of the discussion is focused on western developed countries, there is a small stream of literature on the development of corporate governance in emerging economies. These studies suggest that many developing countries tend to emulate the corporate governance regulations of western countries to attract oversea funds from international financial agencies such as the World Bank and to gain legitimacy in global society, often with dismal results (Mukherjee-Reed 2002; Paredes 2005; Reed 2002; Rwegasira 2000; Siddiqui 2010; Uddin and Choudbury 2008).

In this paper, we empirically examine the effectiveness of corporate governance and especially the role of audit committees (ACs) in Saudi Arabia, one of the pioneers in corporate governance in the Middle East.<sup>1</sup> Similar to other developing and emerging economies, corporate governance in Saudi Arabia remains in the embryonic stage at which governance practices and audit committees are currently neither mandatory nor legally enforced. Moreover, ACs play a very limited role in corporate governance in Saudi companies (Al-Moataz and Basfar 2010; Al-Motairy 2003; Al-Twajjry et al. 2002). The aforementioned studies are often exploratory and thus lack a broader interpretation with conclusions that are based on either interview with

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<sup>1</sup> In 1994, the government of Saudi Arabia issued Ministerial Resolve 903 (the Resolve) to address the audit problems of large joint stock companies and protect the interest of shareholders. The subsequent circulars in 1997 and 1998 issued by Saudi Ministry of Commerce further extend and clarify the AC requirements documented in the Resolve and to encourage more Saudi companies to establish ACs that are in compliance with the Resolve. In 2003, the Saudi Arabian Capital Market Authority (SACMA) was established to oversight the exchange of Saudi stocks. In 2006, SACMA issued a draft for reporting requirements of corporate governance for listed companies based on Organization for Economic Co-operation and Development (OECD) principles of corporate governance: the rights of shareholders, the equitable treatment of shareholders, the role of stakeholders in corporate governance, disclosure and transparency, and the responsibility of the board of directors.

internal and external auditors or surveys from corporate insiders. What has not been examined is the effectiveness of ACs from the perspective of audit committee members. Although the perception of auditors and managers are extremely valuable to understanding the current role of ACs in Saudi corporations, it is also important to explore how audit committee members view themselves and their roles in discharging the prescribed oversight responsibilities.

In order to address this research void, this paper uses a theory-based approach and employs a hybrid methodology to investigate the following research questions: (1) how do audit committee members define AC effectiveness in terms of independence, financial literacy, and financial expertise? (2) what are the perceptions of audit committee members of their assigned oversight responsibilities? and (3) are audit committee members effective in executing their oversight responsibilities? First, we use a survey instrument to explore the characteristics and roles of ACs as a significant component of the corporate governance in Saudi companies. Second, we examine whether audit committees are effective in executing their assigned oversight responsibilities in the Saudi companies by comparing the *perceived* oversight responsibilities of audit committee members and the oversight responsibilities actually *assigned* in the annual reports.

Based on archival data of annual reports and survey data from audit committee members in 91 firms listed on SACMA for 2011, our results indicate that audit committee members consistently show a lack of focus on executing their assigned oversight responsibilities, specifically in the area of internal controls and the quality of the financial reporting process. For example, members of ACs generally regard issues and duties related to reviewing systems of internal control and associated procedures and plans, reviewing interim financial reports, and reviewing and approving accounting changes as relatively unimportant compared to other general assigned and voluntary duties. Consistent with prior studies, this study offers additional empirical evidence that ACs have played a minor role in the current corporate governance practices in Saudi companies. It provides timely information that can inform policy debates and help developing audit standards and accounting regulations in Saudi Arabia.<sup>2</sup>

The remaining paper proceeds as follows. In the next section, we discuss the theoretical foundation of audit committees and review relevant literature. We describe our sample selection and the research design in Section III. The main results are presented in Section IV. We offer a brief conclusion in Section V.

## II. Theory and Literature

Corporate governance is the system by which companies are directed and controlled, manifested in the nature and extent of accountability of people in business and mechanisms that are intended to mitigate the agency problem. One of the main features of corporate governance is the audit committee, which is a subcommittee of the Board of Directors responsible for the oversight of financial reporting process and disclosure. The desired effect of audit committees is two-fold: (1) to prevent fraudulent financial reporting; and (2) to maintain and/or strengthen investor confidence in the quality of financial reporting and financial markets (BRC 1999; CSA 2004).

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<sup>2</sup> The General Auditing Bureau (GAB) of Saudi Arabia lists the development of audit standards and accounting regulations as its top strategic priority of the second strategic plan (2012-2014). Please see April 2010 issue of International Journal of Governance Auditing, available on-line at: <http://www.intosajournal.org/currentedition/current.html>

### **A. Theory**

A number of theories underpinning AC research include perspectives from legal, economics, psychology, and sociology. Security exchange laws and regulations often contain mandates for the presence of an audit committee at companies whose stocks are publicly traded. From the legal and economic perspectives, corporate ACs are viewed as an important monitoring device to mitigate the potential conflict of interests between stakeholders by focusing on the committee's structural characteristics as specified in regulation (e.g. independence, expertise, responsibilities). Such views are essentially based on agency theory (Jensen and Meckling 1976), which suggests that the existence of ACs is primarily motivated by the agency problem provoked by the separation of ownership and control. For example, stakeholders will impose agency costs on the firm when managers are in (or attempt) pursuit of self-interest strategies. Serving as a bridge between management and the auditors (both external and internal), ACs reinforce the quality of financial reporting process by monitoring both top management and auditors.

However, the mere establishment of an AC that structurally conforms to prescribed codes does not guarantee its effectiveness. An AC needs to have qualified members to be effective (Sabia and Goodfellow 2005). Therefore, psychological perspectives such as the expertise paradigm, credibility theory, and accountability theory are used to explain how AC members can be effective in carrying out their assigned responsibilities. The expertise theory suggests that experts and non-experts differ in their problem-solving behavior and decision-making process; it has been used to examine the link between the financial expertise of AC members and the identification of financial reporting issues (McDaniel et al. 2002). Source credibility theory indicates that the credibility of information depends on the perceived providers' competence and trustworthiness; information from a more credible auditor, manager, or director may have strong influence on AC decisions (DeZoot et al. 2003). Likewise, accountability theory proposes that accountable individuals tend to incorporate large amounts of information, make less biased evaluations of decision choices, and consider preferences of those that they are accountable to; an AC that is comprised of more accountable members would critically analyze information and make fair evaluations that result in a decision closer to investor preference (Gaynor et al. 2006).

### **B. Audit committee effectiveness**

Prior literature on AC effectiveness is largely U.S. based research with a focus on the fundamental determinants of AC effectiveness, such as composition, authority, resources, and diligence (DeZoort et al. 2002). In this paper, we focus on the composition and authority components of AC effectiveness.

The composition of ACs considers the structural attributes of an audit committee, including member independence and financial background. There is a direct and positive relationship between AC effectiveness and AC member independence. For example, studies suggest that member independence, expertise, and financial literacy have strongly influenced the effectiveness of ACs (Buckby et al. 1996; Vafeas 2001). Independent ACs are more likely to select industry-specialist (high quality) external auditors (Abbott and Parker 2000), have stronger relationship with internal auditors (Raghunandan et al. 2001; Scarbrough et al. 1998), and are more effective in monitoring senior management and enhancing financial reporting quality (Abbott et al. 2002; Bedard et al. 2004; Beasley et al. 2000; Klein 2002). In addition, the higher the proportion of independent audit committees members, the less likely there is to be earnings

overstatement (Dechow et al. 1996; McMullen and Raghunandan 1996), earnings management (Bédard et al. 2004; Klein 2002), and financial fraud (Beasley et al. 2000). The composition of AC members also influences the auditor's opinion. For example, Carcello and Neal (2000) find that financially stressed firms with a higher percentage of AC "grey" directors – individuals who are not insiders but have a close relationship with management - are less likely to receive a going-concern opinion.

Although AC members often over-estimate their own expertise relative to the perception by their internal and/or external auditors (Kalbers 1992a, 1992b), studies suggest that an organization is less likely to have financial reporting issues (McMullen and Raghunandan 1996), suspicious auditor switch (Archambeault and DeZoort 2001), or engage in earnings management (Bedard et al. 2004) if its AC members are experts in finance and accounting and are more experienced in dealing with governance or internal control issues. With respect to AC members' financial literacy, there has been considerably less research conducted due to a lack of financial literacy benchmarks (Vafeas 2001). Using an experimental design, Song and Windram (2000) find a negative association between higher financial literacy of AC members and incidences of financial reporting issues within an organization. Similarly, McDaniel et al. (2002) demonstrate that financial experts differ significantly from financial literates in their assessment of financial reporting quality and identification of reporting issues.

The audit committee receives its authority from the Board of Directors, corporate laws and exchange listing requirements (DeZoort et al. 2002). By definition, the concept of authority is closely related to the responsibilities and the influence of the audit committee, most often communicated by the audit committee charter of an organization. Because of the rapidly expanding roles of ACs, the charter can help AC members to understand their specific responsibilities, including financial statement review, internal auditor assessment, and external auditor evaluation (DeZoort 1997).

Several studies examined AC responsibility disclosed in AC charters and reports contained in proxy statement. Haka and Chalos (1990) investigate the perception of agency conflicts among AC chairs, management, and auditors and find the evidence that agency conflict exists between AC and management in terms of financial disclosure and discretionary accounting procedures. Lee and Stone (1997) find a mismatch between stated AC responsibilities and members' experiences in dealing with accounting, auditing and control issues. Similarly, Carcello et al. (2002) find a gap between the information in AC charters and reports in proxy statement, suggesting a need to improve the AC disclosure process. HassabElnaby et al. (2007) find that although audit committees made a substantial commitment to increase their assigned responsibilities after the passage of the Sarbanes-Oxley Act of 2002 (SOX), they still need to do more to meet additional challenges facing ACs in a post-SOX environment.

Another line of research under authority has examined the relationships between AC characteristics and AC effectiveness. For example, Kalbers and Fogarty (1993) suggest that AC effectiveness was the result of oversight of financial reporting, external auditor and internal control. Moreover, the power of AC within an organization comes from a combination of written authority and top management support. Bedard et al. (2004) find a negative association between the presence of a clear mandate defining the responsibilities of ACs and earnings management.

In summary, the extant literature identifies several critical components of AC effectiveness, such as the financial expertise, experiences and independence of AC members who have a clear understanding of their oversight responsibilities in the areas of the financial statement review and the assessment of internal and external auditors. These important AC characteristics have been linked to the ability of ACs to engage higher quality external auditors, interact effectively with internal auditors, and improve the quality of financial reporting process.

### **C. Audit committee effectiveness in Saudi Arabia**

Given that corporate governance was a nascent concept in the Middle East a decade ago, it is not surprising to see very limited, often exploratory, AC research in the context of Saudi Arabia. The following paragraphs briefly review the existing research pertaining to the effectiveness of ACs in Saudi corporations.

Al-Twaijry et al. (2002) conduct a series of interviews with academics, external auditors, and internal auditors to examine the role of audit committees in the Saudi Arabian corporate sector. They conclude that both the role and the scope of ACs varied across Saudi companies as a result of different interpretations of Ministerial Resolve 903. Moreover, the existing Saudi ACs are at the *infant* stage of the development trajectory, evidenced by the lack of clearly defined objectives and work scope, independence of AC members, a working relationship with external and internal auditors, and financial expertise. Similarly, Al-Motairy (2003) investigates the extent of current corporate governance practices in Saudi companies and concludes that there is a critical need for (1) a review of existing regulations that provide guidance for current practices of corporate governance; (2) the issuance of guidance for best practices in managing corporate affairs; and (3) the establishment of an organization to accelerate the adoption of best practices of corporate governance.

Unlike the exploratory nature of the studies mentioned above, Al-Moataz and Basfar (2010) empirically analyze the role of ACs in the implementation of corporate governance practices in Saudi corporations. They developed and administered a survey of Chief Executive Officers, Chief Financial Officers, and internal auditors from a sample of listed companies in the stock market. The overall result indicates that ACs of Saudi companies play very limited or no role in corporate governance practices, including financial statements, internal control systems, external auditor, internal auditor, and risk management.

To summarize, these studies consistently document the obviously inadequate role of ACs in the corporate governance of Saudi companies from perspectives of auditors and corporate insiders. Next, we will examine our overall research question of whether audit committees are effective in Saudi corporations from the viewpoint of AC members.

### **III. Research design**

We employ a hybrid methodology to explore the AC characteristics, responsibilities, and effectiveness for a sample of listed companies in the stock market. We first search the annual reports and SACMA's Corporate Governance Regulations (CGRs), where responsibilities assigned for audit committee members could potentially be reported. We then compare the duties *assigned* to audit committee members disclosed in the annual reports and the CGRs to audit

committee members' *perceptions* of their assigned responsibilities in order to test whether audit committees are effective in executing their assigned responsibilities. Although the annual reports and CGRs identify certain tasks as oversight responsibilities of the audit committee, members of the audit committee might actually believe that their tasks differ from those identified in the proxies (HassabElnaby et al. 2007). In this paper, audit committees are effective when members' *perceptions* of what they are doing meet or exceed what the annual reports and CGRs say they should be doing.

### A. Participants

According to the Saudi Stock Exchange Company (Tadawul), there were 149 listed companies in the stock market at the time of the study.<sup>3</sup> All listed firms were included in our sample. We administered the survey in 2011 by hand delivering 149 surveys to audit committee members in 149 firms identified by Tadawul. We hand collected all surveys except for 5 surveys, which were sent by respondents via emails or faxes. The respondents were directed to make their answers relevant to the company mentioned on the enclosed envelope if they serve on more than one audit committee. We made a follow-up telephone call to those participants who did not respond to the initial data collection.<sup>4</sup> Of the 58 individuals who did not return a completed survey instrument, 3 indicated that they were no longer members of audit committees, 7 were unwilling to respond within a reasonable period of time, and the remaining 48 non-respondents gave no reasons. As a result, we have a final sample of 91 useable instruments representing a 61 percent response rate. The 91 respondents represent a total of 91 firms (as shown in Table I).

#### Refer Table I

We examine annual reports to identify audit committees' assigned duties and firms' definition and description of independence, financial literacy, and financial expertise. Unfortunately, the vast majority of our sample provided very limited disclosure about characteristics of ACs in their annual reports. In addition, Saudi companies are not required to file a proxy statement and publicly disclose their audit committee charters. The unavailability of proxy statements and audit committee charters made it impossible for us to learn whether ACs fulfilled their responsibilities as specified in the charter or other documents. The lack of mandatory proxy statements and disclosure of AC charters not only discourage ACs becoming more effective, but also increase the information asymmetry between the firm and its shareholders, which in turn further weakens the confidence of investors in the capital market. Therefore, it is extremely important to have a mandatory disclosure of AC charters in the annual reports because a complete and fair disclosure is critical to the healthy development of the capital market.

Because firms in our sample have not revealed much information about how they define independence, financial literacy, and financial expertise in the AC section of the annual report, we compare only the audit committee duties disclosed in annual reports to audit committee members' *perceptions* of their assigned responsibilities to test whether audit committees are effective in executing their assigned responsibilities.

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<sup>3</sup> We called 60 audit committee members to seek their agreement on participation in our pilot sample. Forty five audit committee members agreed to participate in our pilot sample. For those individuals who agreed to participate, we conducted telephone interviews to clarify the issues under investigation, to draw out new issues, and to explain the terminology used in our instrument.

<sup>4</sup> Our analysis did not reveal any significant differences in the early and late respondents.

## B. Survey Instrument

The survey instrument of ACs has seven sections: (1) member demographics; (2) expertise and composition; (3) independence, financial literacy, and financial expertise; (4) impact of financial crisis on the responsibilities of audit committee; (5) general issues and duties; (6) financial reporting oversight; and (7) auditor oversight. A five-point Likert-type questions is used in Sections 2 and 4. Section 3 of the survey largely follows Carcello et al. (2002) by providing different choices on how the firm defines independence, financial literacy and financial expertise. Sections 5 through 7 consist of yes-no type questions that explore whether the AC perform certain functions in terms of mandatory and voluntary AC responsibilities. The list of mandated responsibilities is derived from CMA resolution Number (1-36-2008) dated 12/11/1429H corresponding to 10/11/2008G making Article 14 of the Corporate Governance Regulations of 2009. The voluntary responsibilities list is derived from prior literature (Carcello et al. 2002; HassabElnaby et al. 2007; IIA 2000).

## IV. Empirical Results

### A. Sample demographics

Table II presents the demographic information of AC members in our sample. Our respondents have a mean age of 42 with 11.2 years of work experience in the industry. With a comparable level of industrial work experience, AC members in Saudi companies are much younger than (> 10 years) their counterparts in the United States (HassabElnaby et al. 2007).<sup>5</sup> Notice that all of the audit committee members are men with roughly half of them with an advanced degree (M.A. or Ph.D.); whereas U.S. sample consists of 81.2 percent of men with 66.6 percent of members holding an advanced degree (HassabElnaby et al. 2007). It is interesting to observe that approximately 96 percent of AC members in our sample have an undergraduate degree in various business disciplines (with the most in Accounting, followed by Finance and Marketing majors), compared to the U.S. sample of 64 percent reported by HassabElnaby et al. (2007). The work experience of AC members is divided among three industry classifications - 18.6 percent in retail, 44 percent in service, and 37.4 percent in manufacturing. However, despite approximately 78 percent of AC members holding a business degree with a concentration in Accounting and Finance, only 41 percent of members considered themselves financial experts.

### Refer Table II

### B. Audit Committee Expertise and Composition

Table III provides results on audit committee perceptions of the importance of expertise, possession of the expertise, and the formation of the audit committee. The audit committee members generally believe that it is equally important for all audit committee members to have a sufficient level of technical accounting and auditing expertise (mean responses of 4.3 and 4.2; respectively). To a moderate extent, they believe it is important for audit committee members to have sufficient industry expertise (mean responses of 3.6). The audit committee members believe that they possess a high level of expertise related to legal issues (mean response of 4.5) and technical auditing standards (mean response of 4.6), and to a lesser extent the Generally Accepted Accounting Principles (GAAP) (mean response of 3.9). Although AC members consider technical accounting standards expertise as the most important element of AC

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<sup>5</sup> HassabElnaby et al. (2007) reported a mean age of 53.4 with 10.9 years of industrial work experience for audit committee members in the U.S sample.

effectiveness, they do not appear to possess the same level of such expertise as indicated by their GAAP familiarity. With respect to auditing familiarity, the opposite is observed in that AC members believe they are most familiar with auditing standards (mean response of 4.7), which, however, are considered less important (mean response of 4.2) relative to GAAP (mean response of 4.3). Finally, to a moderate extent, the participants believe that their audit committee is composed of independent members (mean response of 3.9) and that the committee is properly funded to effectively carry out their duties (mean response of 4.1).

### Refer Table III

#### **C. Definitions of Independence, Financial Literacy, and Financial Expertise**

In the absence of the audit committee charter disclosed in the proxy statements, we ask our respondents about their perception of definitions related to independence, financial literacy, and financial expertise requirements of audit committee members. Table IV presents the results. It should be noted that several companies mentioned more than one item as a base for their definitions of independence, financial literacy, and financial expertise. Panel A of Table IV lists items for member independence. The result suggests that a majority of companies define audit committee member independence based on the standards of Tadawul or Board of Directors alone (82 percent and 30 percent, respectively). A large number of companies mentioned the opinion of the Board of Directors (55 percent) and non-executive directors (48 percent) as elements in defining independence.

Panel B of Table IV displays some variation in the definition for financial literacy requirements of AC members across companies. Two more common definitions of AC members' financial expertise are members who "have a working familiarity with basic finance and accounting practices" and "have a basic understanding of finance and accounting and be able to read and understand fundamental financial statements." The least commonly employed definition is that the audit committee member must "be financially literate as determined in the BOD judgment."

Panel C of Table IV shows how companies describe financial expertise. The most common definition of financial expertise for audit committee members is members who "have past employment experience in finance or accounting" or "have accounting or related financial management expertise". This is in contrast to Carcello et al. (2002) who find these definitions to be less commonly employed for a sample of U.S. firms. A less commonly employed definition, in our sample, is that the audit committee member must "have accounting or related financial management expertise as determined by the BOD".

### Refer Table IV

#### **D. Impact of the Global Financial Crisis on Audit Committee**

If corporate governance has a role in increasing firm performance and firm value as suggested by prior studies (Chan and Li 2008; Klein 2002), this effect should be most evident when a firm faces adverse economic circumstances such as global financial crises. Table V provides results on audit committee perceptions of the impact of the global financial crisis on AC members' oversight responsibilities and disclosure. To a moderate extent, the audit committee members generally believe that the global financial crisis expanded their assigned responsibilities and

performed responsibilities. In addition, the global financial crisis increased the disclosure level of the assigned responsibilities, performed duties and voluntary disclosure.

There is a tremendous concern over the potential liability risk associated with audit committee performance and disclosure. Some audit committees choose to limit their disclosures due to concerns about legal liability (Carcello et al. 2002). To a moderate extent, the audit committee members in our sample indicated that the concern about private litigation precludes audit committee members from disclosing some performed assigned duties (mean of 2.7), disclosing some performed voluntary duties (mean of 2.9), and disclosing some assigned but not performed responsibilities (mean of 2.9).

#### **Refer Table V**

#### **E. General Audit Committee Issues and Duties**

Table VI presents the results of the general audit committee issues and duties. There are several interesting results in this table. First, AC members perceive that they are doing more than what their annual reports mentioned, evidenced by a much higher percentage of members' perceptions than what is reported in the annual reports for all 12 survey items. One must exercise caution in interpreting such results because survey items might not exactly represent the amount of information contained in the annual reports. For example, the survey identified more general issues and duties than what actually appeared in the AC section of the annual reports. As previously discussed, there is no legal requirement for audit committee charter disclosure in Saudi Arabia. Consequently, many listed companies are reluctant to voluntarily provide a detailed listing of audit committee activities in their annual reports. Therefore, investors and users cannot rely on the audit committee section of the annual report alone to know whether the audit committee is actually fulfilling its prescribed responsibilities.

Second, item 2 of Table VI indicates that only 57% of the AC members perceived it as a duty or perceived that they have investigative power, while approximately 5% of the sample indicated that in the AC section of the annual reports, despite the CMA resolution Number (1-36-2008) mandated the investigative power of the AC. Third, to our surprise, all but three items (4, 5 and 8) of the perceived voluntary general duties have a higher percentage than the investigation power mandatory duty (item 2), suggesting that AC members are more focused on voluntary duties than the mandatory responsibilities when dealing with general governance issues. A similar pattern can be observed in the annual report disclosure where AC members are more interested in voluntary duties, such as reassessing charter on an annual basis (item 3), inquiring about business risks and steps taken by the management (item 6), and reviewing management succession planning (item 5), than the mandatory duty of investigative power of ACs.

#### **Refer Table VI**

#### **F. Financial-Reporting Oversight**

Table VII provides details on the audit committee's oversight responsibilities of the company's financial reporting function. Several observations can be made from this table. First, the rates of the mandatory duties are quite low, with one exception related to item 1 "audit committee reviews and discusses financial statements with management." Second, audit committee perceptions of their mandatory duties have quite higher rates than in the reports. Third, per the

survey and report, most audit committees (or the chair) appear not to review the interim financial statements prior to the filing the annual reports (Item 4). This is problematic as the AC oversight of interim financial statement review is an important step for maintaining the quality of the financial reporting process, given that the review may help to identify potential risks associated with weak internal controls (Carcello et al. 2002). Fourth, the vast majority of the audit committee perceptions and reports indicate that audit committees neither review nor approve accounting changes (Item 6). Such practices may further erode the quality of the financial reporting process that includes required communications between audit committees and external auditors. As for the voluntary duties of financial reporting oversight, audit committee members assigned extremely low rates to these functions. This lack of interest on voluntary financial reporting oversight duties is consistent with the duties reported in audit committee section of the annual reports.

#### Refer Table VII

#### G. Auditor Oversight

Table VIII shows the audit committee's oversight of the external and internal auditing function. Overall, the compliance rates are very low from both perceptions of AC members and disclosures in the annual reports. The fear of private litigations (Table V) could explain the lack of sufficient disclosure in the annual reports related to auditor oversight duties. One interesting observation is that AC members, who think they have adequate knowledge about auditing standards (Table III), grossly neglect these mandatory or voluntary auditor oversight responsibilities. Of all items under mandatory auditor oversight, the authority of AC to hire or fire the external auditor (item 1) is rated most important, while reviewing the system of internal control is rated the least important (item 5). Near the bottom of the list includes the review of internal audit procedures and plan (item 8), internal audit scope (item 19), and audit results (item 20). Regarding the voluntary auditor oversight, the dominant duty is reviewing the internal audit personnel decisions (item 12) rather than focusing on communications with internal and external auditors. To summarize, audit committee members show a lack of interest in auditor duties related to internal controls, which is inconsistent with the audit committees' increasing focus on internal controls in the U.S.A. and other developed countries.<sup>6</sup>

#### Refer Table VIII

#### V. Summary and Conclusion

This paper examines the effectiveness of ACs in Saudi corporations from the perspective of audit committee members using a hybrid research methodology that combines data from archival annual reports and a survey instrument. The descriptive analysis reveals that AC members believed their committees consist of largely independent members who should have sufficient levels of accounting and auditing expertise. Moreover, AC members overwhelmingly defined the member independence based on the standards of Saudi Stock Exchange Company and the financial literacy as understanding financial statements or familiarity with financial practices. Different from the U.S., having related work experience in finance or accounting was viewed as the most important element to financial expertise by AC members in Saudi companies. With respect to the impact of global financial crisis on corporate governance, the result indicates an

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<sup>6</sup> We plan to conduct analysis of audit committee characteristics and its mandatory and voluntary performance in the future once the data is available.

expanding role of ACs in both assigned and performed oversight responsibilities, as well as increased voluntary disclosure, consistent with findings from literature mainly focused on U.S.

By comparing the perceptions of AC members about the assigned oversight responsibilities and actual responsibilities disclosed in the annual report, we are able to examine the research question of whether or not AC members are effective in executing their oversight responsibilities. Recall that audit committees are considered effective when the *perceptions* of what they are doing meet or exceed what the annual reports and CGRs say they should be doing. The results reveal some interesting and detailed observations. First, to the extent of general audit committee issues and duties, respondents reported a much higher percentage than the one disclosed in the annual report, apparently suggesting that AC members are doing more than what the annual report has mentioned. However, such observations should be interpreted with caution because the lack of voluntary disclosure in the annual report may be a factor in this huge discrepancy.

Second, respondents normally rated their financial reporting oversight responsibilities quite low except for discussion of financial statements with management (item 1) and external auditor (item 2). It is surprising to observe that there is a general lack of interest among AC members in overseeing the financial reporting process, despite the fact that many AC members are trained to be accounting and financial experts (Table II) and considered themselves as accounting and auditing experts (Table III). It is in contrast to what the theory of expertise has suggested and the findings from empirical studies based in western countries. Such lack of focus on quality control of financial reporting process would contribute to the failure of ACs as an oversight body of corporate governance and increase the risk of fraudulent financial reporting, which in turn, negatively affect organizational performance over time.

Third, with respect to auditor oversight function, we observe that AC members' perceived compliance rate is relatively higher than what is reported in the annual report. While the ability to hire or fire external auditors is rated most important, items related to internal controls are rated lowest in the order of importance, suggesting that audit committees in Saudi companies are not proactive in reviewing systems of internal control, inquiring about internal audit procedures and plans, and reviewing internal audit results, which starkly contrasts to corporate governance practices of companies in the U.S. especially post-SOX (HassabElnaby et al. 2007). Finally, we observe that Saudi companies currently do not disclose their proxy statements and AC charters; such practices increase the information asymmetry between the firm and their shareholders, which in turn, further weaken the confidence of investors in the effectiveness of corporate governance and likely increase the cost of capital. Therefore, we believe that the SACMA should require proxy statements as an integral part of the annual report and should mandate the filing of AC charters.

In conclusion, this paper offers more detailed and timely information from the perspective of AC members about AC effectiveness in Saudi corporations. The most important finding from this study is that members of ACs are more focused on performing selected general assigned and voluntary duties and less actively engaged in the mandatory oversight responsibilities over internal control and the quality of financial reporting process. Whether or not such behavior is a

result of political or religious influences, organizational culture, or other contexture factors deserves more academic attention.

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**Table I: Sample and Response Rate**

	<b>No. of Respondents</b>
Questionnaires Mailed	149
<b>Non-Responses</b>	
Not a member of the audit committee when the survey mailed out	3
Not willing to participate	7
No Reason Provided	48
<b>Total Non-Responses</b>	<b>58</b>
<b>Total Responses</b>	<b>91</b>
<b>Response Rate</b>	<b>61.07%</b>

**Table II: Sample Demographics**

<b>Variable</b>	<b>Current Study</b>
Mean Age	42
Mean years experience in the position	6.08
Mean years experience in industry	11.24
Percent Male	100.0%
<b>Percentage holding degrees</b>	
Bachelor's degree	100.0%
Master's degree	46.0%
Ph.D.	2.2%
<b>Undergraduate majors</b>	
Accounting	68.1%
Finance	9.9%
Law	14.3%
Management	0.0%
Marketing	0.0%
Other	7.7%
<b>Industry</b>	
Retail	18.6%
Service	44.0%
Manufacturing	37.4%
<b>Audit Committee Composition*</b>	
Audit Committee chair	18.0%
Audit Committee Chair who is financial expert	12.0%
Financial experts (76)	41.0%
Audit Committee member	29.0%

**Table III: Audit Committee Expertise and Composition**

<b>Importance of Expertise*</b>	
Accounting Expertise	4.253
Auditing Expertise	4.176
Industry Expertise	3.593
<b>Possession of Expertise**</b>	
GAAP Familiarity	3.857
Auditing Familiarity	4.659
Legal Familiarity	4.538
<b>Audit Committee Composition**</b>	
Independence	3.901
Funding	4.055

\* The 5-point Likert scale range is 1 = strongly disagree, 2 = moderately disagree, 3 = neither agree nor disagree, 4 = moderately agree, and 5 = strongly agree.

\*\* The 5-point Likert scale range is 1 = don't know, 2 = to small extent, 3 = to some extent, 4 = to moderate extent, and 5 = to great extent.

**Table IV: Independence, Financial Literacy, and Financial Expertise**

No.	Item	Perception
<b>Panel A: Definition of Audit Committee Independence</b>		
1	Based on Saudi Stock Exchange Company (Tadawul)	82%
2	Based on opinion of Board of Directors (BOD)	30%
3	Have no relationship to the Company that may interfere with the exercise of their independence from management and the Company	18%
4	Opinion of the BOD and the requirements of the principal exchange or system on which the Company's common stock is traded	55%
5	Non-executive directors, free from any relationship that would interfere with the exercise of their independent judgment	48%
6	Free from any relationship that might interfere with the exercise of independent judgment	51%
7	Other definitions	4%
8	No definition provided	0%
<b>Panel B: Description of Financial Literacy Requirements</b>		
1	Have a working familiarity with basic finance and accounting practices.	76%
2	Be able to read and understand fundamental financial statements	60%
3	Become able to read and understand fundamental financial statements within a reasonable period of time after appointment.	41%
4	Be financially literate	40%
5	Have a basic understanding of finance and accounting and be able to read and understand fundamental financial statements	71%
6	Have a basic understanding of finance and accounting practices.	62%
7	Be financially literate as determined in the BOD judgment	25%
8	Other definitions	8%
9	No definition provided	0%
<b>Panel C: Description of Financial Expertise Requirements</b>		
1	Have accounting or related financial management expertise.	70%
2	Have past employment experience in finance or accounting.	71%
3	Have professional certification in accounting.	62%
4	Have comparable experience or background that result in the individual's financial sophistication.	54%
5	Have accounting or related financial management expertise as determined by the BOD.	36%
6	Other definitions	3%

**Table V: Impact of the Global Financial Crisis on Audit Committee Oversight Responsibilities and Disclosure**

<i>Variable</i>	
<b><i>Impact of the International Financial Crisis on</i></b>	
Audit committee assigned responsibilities expansion	3.637
Audit committee disclosure level of assigned responsibilities expansion	3.846
Audit committee performed responsibilities expansion	3.692
Audit committee disclosure of performed responsibilities	3.714
Audit committee expansion of voluntary responsibilities	3.637
Audit committee voluntary disclosure expansion of fulfilled responsibilities	3.714
<b><i>Impact of Private Litigation</i></b>	
On precluding audit committee from disclosing some performed assigned responsibilities	2.703
On precluding audit committee from disclosing some performed voluntary responsibilities	2.857
On precluding audit committee from disclosing some assigned but not performed responsibilities	2.857

**Table VI: General Audit Committee Issues and Duties**

No.	Item	Perception	Report
<b>Mandatory General Duties</b>			
1	Audit committee charter provides a description of AC responsibilities	97.80%	1.20%
2	Audit committee has investigation power	57.14%	5.00%
<b>Voluntary General Duties</b>			
3	Audit committee reassesses Charter on annual basis	69.23%	15.12%
4	Audit committee Chair can act for entire audit committee at interim	27.47%	1.50%
5	Audit committee reviews management succession planning	48.35%	5.81%
6	Audit committee inquires about business risks and steps taken by management	91.21%	30.23%
7	Audit committee has unrestricted access to all company records	79.12%	2.00%
8	Audit committee has responsibility for code of conduct or ethics content	49.45%	2.33%
9	Audit committee has overall responsibility for compliance program	70.33%	3.49%
10	Audit committee has some responsibility for compliance program	83.52%	4.65%
11	Audit committee familiar with the legal issues facing the audit committee members	82.42%	2.33%
12	Audit committee has a clear policy for hiring of former employees of the external auditors	61.54%	1.00%

**Table VII: Financial Reporting Oversight**

No.	Item	Perception	Report
<b>Mandatory General Duties</b>			
1	Audit committee reviews and discusses financial statements with management	77.91%	4.65%
2	Audit committee reviews and discusses financial statements with external auditor	12.79%	2.33%
3	Audit committee discusses all matters required by GAAP with external auditor	1.16%	2.33%
4	Audit committee or chair reviews interim financial statement prior to filing with the SCMA	2.33%	2.33%
5	Audit committee reviews accounting changes	1.16%	2.33%
6	Audit committee approves accounting changes	1.16%	2.33%
<b>Voluntary General Duties</b>			
7	Audit committee discusses issues with external auditor	1.16%	2.33%
8	Audit committee recommends to BOD inclusion of financial statement in annual report	1.16%	2.33%
9	Audit committee obtains management representation that financial statements use GAAP	0.00%	2.33%
10	Audit committee appraises key management estimates, judgments and valuations	0.00%	2.33%

Table VIII: Auditor Oversight

No.	Statement	Perception	Report
<b>Mandatory Auditor Oversight</b>			
1	Audit committee has the authority to hire/fire the external auditor.	1.68	0.1
2	Audit committee approves the appointment of the external auditor.	1.31	0.1
3	Audit committee assesses independence of external.	1.23	0
4	Audit committee approves and reviews external auditor fees.	1.33	0.08
5	Audit committee reviews systems of internal control.	1.02	0.08
6	Audit committee reviews external audit scope.	1.23	0
7	Audit committee reviews external audit procedures/plan.	1.29	0.06
8	Audit committee reviews internal audit procedures/plan.	1.07	0.1
9	Review the nature and magnitude of fees paid to independent professional advisers or counsels.	1.27	0
<b>Voluntary Auditor Oversight</b>			
10	Audit committee receives information regarding auditor independence	1.21	0
11	External auditor is ultimately accountable to the BOD and the audit committee.	1.22	0.27
12	Audit committee reviews internal audit personnel decisions.	1.59	0.05
13	Audit committee assesses independence of internal audit.	1.04	0.62
14	Audit committee has private meetings with external auditor.	1.25	0.03
15	Audit committee has private meetings with internal audit.	1.16	0
16	External Auditor has unrestricted access to audit committee.	1.4	0
17	Internal Auditor has unrestricted access to audit committee.	1.41	0
18	Audit committee reviews external audit results.	1.26	0.06
19	Audit committee reviews internal audit scope.	1.09	0.07
20	Audit committee reviews internal audit results.	1.09	0.1
21	Audit committee coordinates efforts of internal auditor and external auditor.	1.12	0.12
22	Audit committee evaluates exposure to fraud.	1.12	0.02
23	Audit committee requests to be informed if there is an auditor-management dispute.	1.13	0.02
24	Audit committee reviews the external auditor's management letter.	1.21	0
25	Determine that auditors are free from undue managerial influence.	1.09	0.01
26	Monitor the resources allocated to the internal audit function.	1.1	0
27	Review the use of other auditors or counsels for second opinions.	1.22	0.01