Should Short-Selling be Restricted during a Financial Crisis?

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Abstract

This paper investigates the short-selling of financial company stocks around the time of the SEC September 2008 short-selling ban. More specifically, this paper examines whether this short-selling mainly by hedge funds and other types of sophisticated investors was purely speculative or was it driven by rational behavior in response to a financial company's risk exposure, such as its holdings of subprime related assets and its credit risk exposure. Our results show that short-sellers rationally short-sold those financial company stocks with the greatest subprime and credit risk exposures. This finding has important implications regarding banning short-selling, since it suggests that such a regulation may have muted the disciplining effects of investors in the financial market on those financial companies with the greatest risk exposures.

1. Introduction

Short-sellers (mainly hedge funds) have been accused of using abusive short-sale strategies to push down the prices of the equities of the financial companies during the 2007-2009 crisis. A sequence of actions taken by the SEC seems to be consistent with the belief that this allegation was indeed true. Specifically, on July 15, 2008 the SEC issued an emergency rule to limit certain types of short-selling, namely "naked" short-selling (short-selling without actually borrowing the shares), of 19 major financial firms. On September 17, 2008 the SEC announced that this rule was extended to all publicly traded firms. On September 18, 2008 the SEC announced a ban on all types of short-selling of the stocks of 797 public financial companies (effective immediately) that continued until October 8, 2008. At the time SEC's Chairman Christopher Cox claimed that this short selling ban was an effort "to combat market manipulation that threatens investors and capital markets"[2]. Within a week, the prohibition on short-selling had spread to markets overseas, such as the United Kingdom, Australia, Taiwan and the Netherlands. Nevertheless, hedge fund managers actively opposed the ban, arguing that regulators are actually punishing short-sellers for the mistakes made by financial companies who had exposed themselves to risky subprime assets, such as the subprime mortgage-backed securities.

The crux of the debate between the SEC and hedge funds is whether short-selling activity could be justified by fundamental weaknesses of the targeted financial companies, e.g. due to over-investment in risky subprime assets, or were they just purely speculative manipulations of the target companies' stock price. If companies with greater exposures to the subprime market were actually short-sold to a larger degree, then hedge fund managers' opposition to the SEC's

[2] See SEC Press Release 2008-211 on September 19, 2008.

ban on short-selling seems reasonable. Indeed, as has been shown in a more general context, short-selling activities enhance the informational efficiency of asset prices (see Boehmer and Wu 2009). By short-selling, informed traders, such as hedge funds inject additional information (and potentially more accurate information) into the market place.[3] Thus, banning short-selling causes unfavorable consequences. In particular, stock prices may no longer be accurate reflections of the full information set in the market place.

Interestingly, Gagnon and Witmer (2009) have demonstrated, via a natural experiment crafted around cross-listed stocks, that the short-sale ban of 2008 caused stock prices to actually trade above their equilibrium values, as Miller's (1977) price optimism theory suggests. This is consistent with an opinion piece published in the Wall Street Journal, in which Bris (2008) argues that *"*the emergency ban imposed last Monday by the Securities and Exchange Commission on short-selling for all 'financial' stocks has done more harm than good" [4]since the market liquidity of the 797 stocks targeted by the short-sale ban dried up, bid-ask spreads increased significantly, and intra-day price ranges almost doubled. In general, short-sellers, especially informed short-sellers, play an important monitoring and disciplining role for those targeted companies by discouraging incautious, value-destroying investments.[5] As another example, Lorenzo Di Mattia, manager of hedge fund Sibilla Global Fund, argued at the time of the ban: "……Funny they don't understand that it is because there is short-selling that the market didn't crash. If there were no shorts in this market, there would be only sellers."[6] Finally, banning

[3] See Desai, Ramesh, Thiagarajan and Balachandran (2002), Asquith, Pathak, and Ritter (2005) and Diether, Lee, and Werner (2007), for example.
[4] See article in Wall Street Journal: "Shorting Financial Stocks Should Resume" by Arturo Bris, September 29, 2008.
[5] Balasubramanian and Cyree (2008) show evidence that short selling of bank stocks can provide signal about future performance of the banks.
[6] See article in Dow Jones Newswires: "UPDATE: Short Selling Limit May Have Unintended Consequences" by Rob Curran, July 15, 2008.

short-selling limits investors' hedging of their market risks. Short-selling those financial companies' stocks with significant exposures to risky subprime assets might be viewed as a crucial self-rescue strategy for some institutional investors.[7]

To address the key question of whether the short-selling ban was a deterrence to speculative attacks on financial company stocks, we first examine whether short-sellers actually differentiated between financial companies with substantial exposures to the subprime market and those with little exposures over the 2007-2008 period prior to the SEC's short-sale banning rule (which became effective on September 19, 2008). Secondly, we examine Credit Default Swap (CDS) spreads during the same period as an alternative, but broader measure of a financial company's credit risk exposure. If short-selling is not pure speculative manipulation, we might expect that companies with greater risk exposures (measured by the subprime-to-assets ratio and CDS spreads) were short-sold more. Thus, in our analysis, we investigate whether short-selling activity rationally reflected financial companies' insolvency risk exposure.

To examine the extent to which financial companies have been exposed to the subprime market, we create a unique dataset of subprime activity at the financial company level by hand-collecting subprime assets related accounting information from financial company annual reports, over September 2005 to September 2008 period, ending prior to the short-selling ban on September 18, 2008. Since, on average, there is a three-month lag between a company's filing date and its fiscal year end date (following Compustat's definition of fiscal year end), our sample of financial report filings, from September 2005 to September 2008, covers 2005 to 2007 fiscal years. Thus, for example the fiscal year-end traded on Meta Financial Group Inc of NASDAQ is

[7] Brunnermeier (2008) mentioned a Wall-Street saying: "If you can't sell what you want to sell, sell what you can sell."

September 30. According to Compustat's definition of fiscal year end, the financial report that ends on 30 September 2005 is considered fiscal year 2005. The filing dates for the fiscal year end 2005 to 2007 were 23 December 2005, 21 December 2006 and 11 January 2008, respectively. It should also be noted that in general, prior to 2009 the subprime asset holdings of financial companies were primarily reported in footnotes to annual financial reports.

Our results show that financial companies' exposures to the subprime market had a significantly negative impact on their equity performance around the filing dates of their 2007 (fiscal year) annual reports, when the unfavorable consequences of their over-investment in subprime assets were becoming apparent. By comparison, no such pattern is found around the filing dates of their 2005 and 2006 annual reports. More importantly, we find that the greater a financial company's exposure to the subprime market, the greater the short-selling activity of its equity around the filing date of its 2007 annual report.[8] Moreover, the equities of financial firms were subject to far more short-selling around the 2007 fiscal year-end filing date when compared to 2005 and 2006. Interestingly, we also find that if a financial company is adequately capitalized, the effect of subprime exposure on short-selling is weakened. Both results suggest that short-sellers were behaving rationally in the sub-period leading up to the September 2008 ban.

Our results using CDS spreads provide further confirmation that short-selling reflected financial companies' risk exposure. We find that short-selling responded to CDS spreads and to one-year changes in daily CDS spreads where CDS spread can be viewed as reflecting a financial company's insolvency risk. In sum, we find no conclusive evidence to support the SEC's claim that short-selling activities in the financial crisis were abusive. Instead our results

[8] We consider different day-windows around the filing date (-10, -2) and (-10, +10).

suggest that short-sellers actually differentiated between those financial companies with substantial risk exposure from those with little exposure.

The paper is organized as follows. In section 2, we discuss our hypotheses. In section 3, we describe our data and variables. In section 4, we discuss our methodology. In section 5, we present our empirical results. We conclude in section 6.

2 Hypotheses

One of the major tasks of this paper is to investigate whether short-sellers differentiate among financial firms based on their exposure to the subprime market. Many financial firms, especially banks have incurred significant losses during the financial crisis due to the dramatic rise in mortgage delinquencies, defaults and foreclosures. Hence we expect that informed, sophisticated traders should short-sell the equities of financial companies with the greatest risk exposure. Thus, our first hypothesis (H1) is:

Hypothesis1: Short-selling is more profound for financial companies with the greatest exposure to the subprime market.

We also use an alternative measure of a financial company's risk exposure, namely CDS spreads. In general, CDS spreads capture many of the risk factors that could potentially impact a company's insolvency risk. Accordingly, the higher the CDS spread, ceteris paribus, the greater a company's expected insolvency risk exposure. Consequently, we expect that around fiscal filing dates the higher a company's CDS spreads the larger the scale of short-selling of a financial company's equity.

Hypothesis 2: Short-selling is more profound for financial companies with greater risk exposures measured by CDS spreads.

3 Data and Sample Construction

In this section, we discuss the construction of our sample and data sources. Initially our sample consists of the 797 financial companies that were put on the no-short-sale list by the SEC in September 2008. Then we hand-collect detailed accounting information on financial companies' exposures to the subprime market and the filing dates of the information from their annual reports (10-K).[9] After removing those observations without 10-K filing records or filing dates, our sample consists of 531, 538 and 536 companies for fiscal years 2005, 2006 and 2007 respectively.

3.1 Measures of Exposure to the Subprime Market

We first create a direct measure of the exposure to the subprime market. This measure includes a financial company's investments in subprime loans as well as holdings of securities backed by subprime mortgages. A large number of financial companies mention their total subprime exposure at the beginning of the annual report (the firm performance review section). In this case, we directly assign those numbers as the total amount of exposure to the subprime market. In other cases, we look for the subprime investment information in two sections of the annual report details on its: (1) loan portfolio and (2) investment portfolio.

[9] We obtained the annual financial reports of the financial firms from SEC filing on Edgar-Pro online.

In the loan portfolio section of the annual reports, we identify and calculate the total amount of subprime exposure principally based on the following criteria: (1) the percentage of loans explicitly reported as non-prime; (2) the percentage of loans is indicated as being significantly impacted by the mortgage crisis. For the firms that clearly state no exposure to subprime lending, zero is assigned. Otherwise, we code them as missing.

In the investment portfolio section of the annual reports, our primary focus is on the dollar amount of investment assets that are backed by subprime mortgages. Most of this information was first reported in fiscal year 2007. Additionally, subprime-related investments were largely undertaken by major banks. Many smaller publicly traded banks were not actively involved in subprime-market-related investments.[10] The exposure to the subprime market is standardized by a company's total assets[11]. We report summaries statistics by each fiscal year in Panel A of Table I.

3.2 An Alternative Measure of Insolvency Risk Exposure

In addition to the above measure we utilize Markit's Credit Default Swap (CDS) database, which provides a measure of the CDS spreads on the underlying financial companies' debt. In general, the higher a CDS spread, the greater a company's insolvency risk exposure. The Markit CDS database records daily information, including the underlying currency of a swap, maturity and seniority, etc. Here we choose the spreads of 5-year Senior CDSs with the U.S. dollar as the

[10] In most cases, they only had limited subprime exposure which would not have significantly affected their performance and these data was not separately reported. If so, they are coded as missing since their subprime-related investment activity is not clear.

[11] We obtain qualitatively similar results if we use Collaterized Debt Obligation (CDO) as an alternative measure of financial company's risk exposure.

underlying currency and non-restructuring in the documentation clause. The CDS spread data are available from January 2006 to September 2008. We merge the CDS database with our financial companies' sample by ticker and year and then by name and year (we manually checked the merged results to ensure accuracy). Since our main interest is to investigate whether, prior to the short-selling ban, short-selling activities were related to the riskiness of the firm, we calculate a firm's specific CDS spread using two approaches. First, for every firm, we calculate one-year change in the average of the daily 5-year CDS spread for the period from September 2007 to 17 September 2008, we call this variable Δ CDS. To compute the ΔCDS, we calculate the average daily CDS for two periods: *t* and *t-1,* where *t* is the period from18 September 2007 to September 17, 2008 (one day prior to the short-sale ban) and *t-1* is the period from September 18, 2006 to September 17, 2007. The difference between CD_t and CD_{t-1} is the one-year change in CDS spreads (ΔCDS). Second, we compute for every firm the average daily 5-year CDS spread for the 90 days immediately after the filing dates of its fiscal reports. The assumption here is that CDS spreads adjust to reflect exposure to risky assets as reported in the financial statements of the firm. In Table I, we report the summary statistics for Δ CDS over the period September 2007 to 18 September 2008 (see Panel B) and the 90 day average 5-year CDS spreads for the fiscal years 2005, 2006 and 2007 (see Panel C). Not surprisingly the CDS spreads, on average, were much higher after the filing dates of 2007 annual reports.

3.3 Other Control Variables

We merge our sample of financial companies with Compustat data and report, in Panel D of Table I, different measures of financial firm characteristics and performance. Firm size refers to the natural logarithm of a financial company's total assets (in million dollars). Option refers to

an indicator variable as to whether a financial company's equity has associated options traded within 3 months before and after the filing dates of its annual reports according to the OptionMetrics database. The intuition of adding an Option indicator is that a long position in a put option of a stock could be viewed an alternative bearish investment strategy to taking a short position in the firm's equity. Additionally, we merge our database with Compustat/Bank database to acquire the Tier-1, Tier-2 and combined risk-based capital ratios for banks and bank holding companies.[12] In general, when compared to fiscal years 2005 and 2006, fiscal year 2007 showed banks experiencing a deterioration in their capital ratio measured by both the Tier-1 and combined risk-based capital ratios.

<Insert Table I>

3.4 Short-Selling Data

According to Regulation SHO (REGSHO) rule adopted in mid 2004, all Self Regulatory Organizations (SROs) had to report tick-data on short-sales, including information on ticker name, short-sale volume, short-sale price, listing exchange, etc. Our REGSHO database includes short-sales made on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), National Association of Securities Dealers Automated Quotations (NASDAQ), National Stock Exchange (NSX), Archipelago (ARCA), Boston Stock Exchange (BSE), Chicago

[12] The number of observations of the capital ratios is smaller than any over control variable, because some of the financial companies are not banks or bank holding companies and therefore they are not required to report the capital ratios.

Stock Exchange (CHX), National Association of Securities Dealers (NASD) and Philadelphia Stock Exchange (PHLX)[13].

Importantly, it should be noted that REGSHO short-selling data covered only the period from January 2, 2005 to July 6, 2007. We complemented this database by purchasing short-sale data over the period July 1 2007 to 18 September 2008 from the NYSE and ARCHA, two exchanges that still report daily short-selling after the REGSHO period. In total this combined short-sale database covers 539 of the 797 financial companies.

Following the short-selling literature, we focus on "abnormal" short-selling. We measure abnormal short-selling by adjusting short-selling activity around the filing dates of the financial reports by "normal" short-selling activity and then scale it by the number of shares outstanding, (Short/SHROUT) or by the average daily trading volume over the window (-120, -61), adjusted to any change in number of shares outstanding (Short/Avol). We use three alternative measures for "normal" short-selling. In the first definition called abnormal Short/SHROUT1, we define "normal" short-selling as the contemporary median short-selling activity ratio on the stock exchange of the financial firm. In the second definition called abnormal Short/SHROUT2, we define the "normal" short-selling as the mean short-selling ratio of the financial firm over the a 6 month period before and after the financial report filing date but excluding the event period (-30,+30), where 0 is the filing date. In the third definition, abnormal Short/Avol, we define "normal" as the average short-selling ratio over the period within 6 months before and after the filing date but excluding the event period.

[13] Please see Massoud, Nandy, Saunders and Song (2009) for detailed discussion of the REGSHO database.

In this paper we use both cumulative short-selling and cumulative abnormal short-selling activities based on the test under consideration.

4. Methodology

We use univariate analysis as well as multivariate regressions to test our two hypotheses.

4.1 Methodology to Test Hypothesis 1(H1)

For the univariate analysis, we use the three different measures of cumulative abnormal short-selling (abnormal Short/SHROUT1, abnormal Short/SHROUT2 and abnormal Short/Avol) and the cumulative Short/SHROUT. Around financial report filing date we compute cumulative short-selling of a financial firm's equity for different windows including (-10, -2) and (-10, +10). For each fiscal year end from 2005 to 2007, we separate observations into 3 groups based on their subprime-to-assets ratios. For each fiscal year end and for each group we test whether its mean cumulative abnormal short-selling is different from zero and whether the mean difference between the abnormal short-selling of group 1 (lowest subprime-to-assets ratios) and 3 (highest subprime-to-assets ratios) is significantly different from zero.

In the multivariate analysis, we use year fixed effect regressions and cluster error term at the firm level. The dependent variable is cumulative abnormal short-selling activity relating to a financial firm's stock for different windows around the filing date of its annual reports including (-10, -2) and (-10, +10). For the explanatory variables, in addition to the subprime-to-assets ratios, asset size and the option dummy, we include five additional variables. First, we include a bank dummy variable which equals 1 if a financial firm is a bank based on Compustat identification and zero otherwise. This may reflect a greater propensity of regulators to support

banks in financial distress compared to other financial firms. Second, since well capitalized banks are generally perceived to be less risky, we include in our tests, a variable that measures the interaction between the bank dummy variable and its tier-1 capital ratio (CAPR1). Third, we include a quadruple interaction between a bank's capitalization ratio (CAPR1), the bank dummy variable, its subprime-to-assets ratio and a report filing dummy in 2007 (Year_2007).[14] This interaction variable allows us to test whether the market accounts for the potential of a well capitalized bank to withstand the enhanced insolvency risk of a high subprime-to-assets ratio. Fourth, we include an interaction variable between the subprime-to-assets ratio and annual report filings for 2007. Fifth, we include an interaction variable between the subprime-to-assets ratio and annual report filings for 2006. The last two variables allow us to test whether there were differences in the behavior of short-sellers while the financial crisis was developing. We expect to observe an increase in the abnormal short-selling activities around 2007 annual reports filings for firms with the greatest exposures to the subprime market.

4.2 Methodology to Test Hypothesis 2 (H2)

For the univariate analysis, we use two different measures of the CDS spread: the 90 day average of the 5-year CDS spread after the filing dates of annual financial reports (i.e. 2005, 2006 and 2007) and the one-year change in the daily average of the 5-year CDS spread (ΔCDS) from 18 September 2007 to 17 September 2008. For the 90 day average CDS, and similar to our tests of H1, we compute the three alternative measures of abnormal cumulative short-sales and the cumulative Short/SHROUT using (-10, -2) and (-10, +10) windows. We then separate the observations into 3 groups based on the average CDS spreads. For each fiscal year end and for

[14] That is the dummy for filings in 2006 and 2005 is zero.

each group we test whether the mean of the cumulative abnormal short-selling was significantly different from zero and then test if the mean difference between group 1 (lowest CDS spread) and 3 (highest CDS spread) is significantly different from zero.

For the ΔCDS, we include three measures of short-selling: one-year cumulative Short/SHROUT and one-year cumulative Abnormal Short/SHROUT1, as well as the one-year change in the cumulative Short/SHROUT (Δcumulative Short/SHROUT) over the period from 18 September 2007 to 17 September 2008.[15] We first identify observation(s) with zero or negative ΔCDS as group 0, and then sort the remaining observations with positive ΔCDS into three groups: groups 1 and 3 contain respectively the lowest ΔCDS and the highest ΔCDS. Using our alternative measures of short-selling, we conduct t-tests to examine whether the abnormal short-selling within each group is significantly different from zero and whether the mean-difference between group1 (lowest positive ΔCDS) and group3 (highest positive ΔCDS) is significantly different from zero.

In our multivariate analysis of the average of a financial company's daily 5-year CDS spread over the 90 days post its annual report filing date, we use year fixed effect regressions and cluster error term at the firm level. The dependent variable is cumulative abnormal Short/SHROUT1 for different windows around the filing date of annual reports of the financial firms including (-10, -2) and (-10, +10). For explanatory variables, our key variable is the average 5-year CDS spread over the 90 days post the filing date of a company's annual financial reports. We also include the other related control variables mentioned above.

[15] The Δ*cumulative Short/SHROUT* is the difference between the *Cumulative Short/SHROUT* $_t$ and the *Cumulative Short/SHROUT* $_{t-1}$. where *t* is the period from18 September 2007 to September 17, 2008 (one day prior to the short-sale ban) and *t-1* is the period from September 18, 2006 to September 17, 2007.

For the ΔCDS, we employ cross-sectional multivariate regression analysis. For the dependent variable, we employ two alternative measures: one year cumulative abnormal Short/SHROUT1 and one-year change in the cumulative abnormal Short/SHROUT1 over the September 2007 to 17 September 2008 period (i.e. ending one day before the short-sale ban). We also include related control variables as discussed above.

5. Empirical Results

In this section, we discuss our empirical results. In addition, to motivate our tests, we first examine how the market reacted to financial firms' filings of their annual reports with the SEC, sorting financial firms by their subprime-to-assets ratios.

5.1 Results for Announcement Day Returns

We conduct an analysis of a financial company's stock price performance around the announcement date of its annual reports. Abnormal return (AR_{it}) of a given company i on day t is defined as the difference between the daily return of firm *i* on day *t* and the contemporaneous return on CRSP Equal Weighted Index (EWRETD). Day *0* is defined as the filing date of an annual report, or the next trading day if the filing date is not a trading day. We first sort the observations into three groups according to the subprime-to-assets ratios for each fiscal year. Group 1 and group 3 contain observations with the lowest and the highest subprime-to-assets ratios, respectively. These results are presented in Panel A of Table II. We then sort the observations into three groups according to the 5-year CDS spreads for each fiscal year. Group 1 and group 3 contain observations with the lowest and the highest CDS Spreads, respectively. We

report t-tests of abnormal returns for each group and each fiscal year. These results are presented in Panel B of Table II.

<Insert Table II>

As you can see from Panel A of Table II, for the fiscal years 2005 and 2006, none of the groups has significant abnormal announcement returns over virtually all event windows (except the group with highest exposures over the window [-1, +10] for the fiscal year 2006). However, around the 2007 annual reports announcements, the *CARs* of the group with the highest subprime-to-assets ratios is significantly (both economically and statistically) negative over all windows. For example, the *CAR* over window (-1, +1) of group3 (highest exposure group) around 2007 fiscal year filing is -1.92%, significant at the 1% level. By contrast, the *CARs* of the group1 (lowest exposure group) are insignificant over all windows around the announcements dates of 2007 annual reports.[16] Using a mean-difference test between group1 and group3 *CARs*, we find the average *CAR* of group1 is significantly higher than that of group3 around the filing dates for 2007 annual reports only.

We obtain similar results when we sort *CARs* by 90 day average daily CDS spread post the annual report filings by financial companies, see Panel B of Table II. In particular, for the fiscal year 2007 annual reports, the group with the lowest CDS spreads had significantly lower *CARs* than those with the highest spreads. Again, these results suggesting that the market reacted rationally to the public announcement of these exposures.

5.2 Results for Testing H1

[16] The intermediate group CARs are generally significantly negative.

The univariate results for testing H1 are presented in Table III and those for the multivariate tests are presented in Table IV. We focus on three alternative measures of abnormal short-selling around different event windows including (-10, -2) and (-10, +10). As discussed earlier, the financial event is the filing of a financial firm's reports with the SEC. Since our results are not sensitive to different event window specifications, we focus on the results for the financial report filing event window (-10, -2). As before, we sort financial firms into three groups based on the subprime-to-assets ratios.

Table III shows the average cumulative abnormal short-selling using the three alternative definitions as well as the raw contemporaneous cumulative short-selling ratio.[17] In general, cumulative abnormal short-selling was most positive and significant around the announcement dates of the 2007 annual reports for the group with the highest exposures to the subprime market. The results are mixed for groups 1 and 2 (lower exposures to the subprime market). Specifically, the mean difference between the cumulative abnormal short-selling of group 1 firms' equity (firms with lowest exposure) and group 3 firms equity' (firms with highest exposure) is negative and significant at the 1% level using all three definitions of abnormal short-selling in addition to the raw contemporaneous cumulative short-selling ratio.

<Insert Table III>

Table IV reports our multivariate analysis of short-selling activity, measured as the cumulative abnormal Short/SHROUT1 over (-10,-2) event window. We present our results in four columns (models) based on adding or dropping alternative control variables. Model II includes all of the explanatory variables. Our key variables are the subprime-to-assets ratios

[17] As we discussed in section 3, the cumulative Abnormal Short/SHROUT1 ratio (the "normal" is defined as the mean Short/SHROUT of the exchange where a given financial company is traded) compares the short selling of a financial company's equity to the mean of a stock exchange on the same trading day.

(Subprime) and the Subprime ratio interacted with: (i) a year dummy for financial reports filed between September 2007 to 8 September 2008 (ten days prior the short-sale ban), Year_2007, and (ii) interacted with a Bank dummy, CAPR1 and Year_2007 dummy, where Bank dummy equals 1 if financial firm is a bank based on Compustat identification and zero otherwise, CAPR1 is tier-1 capitalization ratio and Year_2007 dummy equals 1 for 2007 fiscal year financial reports and zero otherwise.

<Insert Table IV>

Consistent with the univariate tests above, the coefficient on the subprime-to-assets ratio is insignificant over the whole 2005-2007 sample period, however, its interaction with the Year_2007 dummy is positive and significant at the 5% level in all Models. This implies that investors engaged in short-selling, based on the financial firms' exposures to the subprime market when subprime exposures were perceived to have reached a significant threshold. Interestingly, the coefficient on the quadruple interaction between capital ratio (CAPR1), Bank dummy, the subprime-to-assets ratio and Year_2007 dummy is significantly negative at the 5% level in Model II and at the 10% level in Model IV. This result suggests that the impact of subprime exposure on short-selling activity in fiscal year 2007 was weaker for well capitalized banks.

In summary, our results provide support to hypothesis 1 i.e., *Short-selling is more profound for financial companies with the greatest exposures to the subprime market.*

5.3 Results for Testing H2

Our results for hypothesis 2 are presented in Tables V and VI. In Table V, we present our univariate tests. In Panel A we group abnormal short-selling based on the average 5-year CDS spread computed over 90 days post the filing of annual financial reports. In Panel B, we analyze three different measures of short-selling based on the one-year change in a daily 5-year CDS spread (Δ CDS).

<Insert Table V>

The results in Panel A of Table V show that for fiscal year 2007 the abnormal short-selling was positive and significant at the 1% level for group 3 using all four different specifications and the difference between group 1 (lowest CDS spread) and group 3 (highest CDS spread) was negative and significant at the 1% level for two measures, cumulative abnormal Short/SHROUT1 and cumulative contemporary Short/SHROUT. For fiscal years 2006 and 2005, the difference in short-selling between group 1 and 3 is also negative and significant at the 1% level for two measures (cumulative abnormal Short/SHROUT1 and cumulative contemporary Short/SHROUT).

In Panel B, our results show that for Δ CDS, the difference in short-selling between group 1 (lowest Δ CDS) and 3 (highest Δ CDS) is negative and significant at the 1% level in all three specifications of annual cumulative short-selling.

Table VI reports a multivariate analysis of the determinants of short-selling activity using both Δ CDS in Panel A and CDS spread In Panel B. In Panel A the coefficient of Δ CDS is positive and significant at the 1% level in all models (Models I to IV) using the two different measures of one-year cumulative short-selling, one-year Cum. Abnormal Short/SHROUT1

and one-year ΔCum. Short/SHROUT. Similarly, the results in Panel B show that the coefficient on the CDS spread in positive and significant at 1% level in Model V and at 10% level in model VI using the Cumulative Abnormal short/SHROUT1 over Window (-10,-2).

<Insert Table VI>

In summary, our results also provide support for hypothesis 2 in this paper; *Short-selling is more profound for financial companies with higher risk exposures measured by CDS spreads.*

6. Conclusion

In conclusion, the results of this paper provide evidence that short-sellers differentiate between target financial firms according to market participants' perceptions of their risk exposures. More specifically, the higher a financial company's exposure to the subprime market during the financial crisis the higher the amount of short-selling of the equity of that firm around annual financial report filing dates in the year immediately prior to the ban on short-selling by the SEC. Using different measures of abnormal cumulative short-selling we also find that the higher was the average 5-year CDS spread and/or the one-year change in the daily 5-year CDS spread the higher was short-selling activity related to a financial firm's equity.

Our results, generally, support the arguments of hedge fund managers and by implication of Miller's (1977) model that banning short-selling may cause market disequilibrium. Accordingly, our findings have important implications regarding the current debate over limiting short-selling and suggest that such a regulation may well mute the disciplining effects of the financial market on financial firms with greatest exposure to insolvency risk.

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Table I: Summary Statistics

In Panel A of Table I, we report financial companies' exposure to subprime assets reported in their annual reports and footnotes for fiscal years of 2005 2006 and 2007.[1] Subprime-to-assets ratio (Subprime) refers to the ratio of the total amount of investments in subprime assets to total assets. In Panel B we report summary statistics of the one-year change in Credit Default Swap (CDS). In this paper we utilize the spreads of 5-year senior CDSs with U.S. dollars as the underlying currency and non-restructuring in the documentation clause. To compute the ΔCDS, for every firm, we calculate the average daily CDS for two periods: *t* and *t-1,* where *t* is the period from18 September 2007 to September 17, 2008 (one day prior to the short-sale ban) and *t-1* is the period from September 18, 2006 to September 17, 2007. The difference between CD_t and CD_{t-1} is the one-year change in CDS spreads (ΔCDS). In Panel C, we report the average CDS spread of a given financial company within the 90 days after the filing dates of its annual financial reports. In Panel D, we report different measures of financial companies' firm characteristics. Firm Size refers to the natural logarithm of total assets (in million of dollars). Option is an indicator variable as to whether a financial company's equity has an option trading record in the OptionMetrics database within 3 months before and after the filing dates of annual reports. We also report Tier 1, Tier2 and combined risk-adjusted capital ratios for the banks and bank holding companies. All variables in Table I are winsorized at the 2 and 98 percentiles.

Panel A: Financial Companies' Exposures to Subprime Assets				
		Fiscal Year		
		2005	2006	2007
Subprime-to-assets (Subprime)	N	51	75	316
	Mean	0.0287	0.0441	0.0091
	Median	0.0034	0.0051	0
	Max	0.1514	0.6779	0.1363
	Min	0	0	0

[1] As mentioned in the introduction, on average there is a three month lag between a company's filing date and its fiscal year end date. Following compustat's definition of fiscal year end our financial report filing from September 2005 to September 2008 covers 2005 to 2007 fiscal years.

Panel B: Average One-year ΔCDS Spread (%) (18 September 2007 to 17 September 2008)				
N	Mean	Median	Max	Min
74	1.1743	0.5326	10.4353	-0.6287

Panel C: 90 day average 5-year CDS Spread (%)			
	Fiscal Year		
	2005	2006	2007
N	46	57	50
Mean	0.3088	0.2466	1.7769
Median	0.2152	0.2060	1.1968
Max	1.9377	0.5905	9.8405
Min	0.0568	0.0721	0.3064

Panel D: Firm Characteristics						
	2005		2006		2007	
	N	Mean	N	Mean	N	Mean
Size	531	7.7242	538	7.8169	536	7.8766
Option	543	0.2081	547	0.2340	549	0.2623
Risk-Adjusted Capital Ratio - Tier 1 (CAPR1)	365	11.4659	402	11.3547	403	10.8102
Risk-Adjusted Capital Ratio - Tier 2 (CAPR2)	365	2.6863	402	2.9455	403	2.9064
Risk-Adjusted Capital Ratio – Combined (CAPR3)	365	14.1522	403	14.3317	403	13.7166

Table II: Univariate Analysis of Cumulative Abnormal Returns

Table II summarizes the univariate analysis of cumulative abnormal returns (CAR) over different windows. Abnormal return (AR_{it}) of a given firm i on day t is defined as the difference between the daily return of firm i on day t and the contemporaneous return on CRSP equal weighted index (EWRETD). Day 0 is defined as the filing date of annual reports, or the next trading day if the filing date is not a trading day, for fiscal year end of 2005, 2006 and 2007 during the period from September 2005 to 8 September 2008 (ten days before the short sale ban by the SEC). In Panel A, the observations are sorted into three groups according to the subprime-to-assets ratio (Subprime) in each fiscal year. Group 1 and group 3 contain the observations with lowest and highest subprime-to-assets ratios, respectively. We report the t-tests of CARS within each group and mean difference t-tests between group 1 and 3. In Panel B, we conduct similar analysis but instead we sort the returns by the daily average 5-year CDS spreads over 90 days post the filing date of financial reports.

Panel A: Sorted by Subprime-to-assets Ratios

Fiscal Year	Subprime			CAR(-1, +1)		CAR(-1, +2)		CAR(-1, +5)		CAR(-1,+10)	
	Group	N	Mean	Mean	t	Mean	t	Mean	t	Mean	t
2005	1(lowest)	17	1.0000E-06	0.0018	0.46	0.0065	1.38	0.0019	0.28	0.0055	0.82
	2	17	0.0051	-0.0065	-1.59	-0.0036	-0.79	-0.0048	-0.68	-0.0066	-0.86
	3(highest)	17	0.0809	0.0096	1.38	0.0032	0.56	0.0052	0.81	0.0056	0.52
	(1-3)		-0.0809	-0.0078	-0.98	0.0033	0.45	-0.0033	-0.35	-0.0001	-0.01
2006	1(lowest)	25	7.2000E-05	-0.0016	-0.46	0.0004	0.11	-0.0008	-0.13	-0.0090	-1.28
	2	25	0.006512	-0.0017	-0.41	-0.0057	-1.11	-0.0082	-1.53	-0.0147	-1.15
	3(highest)	25	0.125717	-0.0002	-0.04	0.0002	0.02	-0.0058	-1.08	-0.0172 ***	-2.83
	(1-3)		-0.1256	-0.0014	-0.21	0.0003	0.03	0.0050	0.61	0.0082	0.88
2007	1(lowest)	192	0	-0.0067 *	-1.67	-0.0022	-0.44	-0.0024	-0.43	0.0076	1.18
	2	19	0.0003	-0.0257 **	-2.49	-0.0304 ***	-2.88	-0.0498 ***	-3.48	-0.0357 *	-2.10
	3(highest)	105	0.0274	-0.0192 ***	-3.13	-0.0173 ***	-2.77	-0.0207 **	-2.20	-0.0232 **	-2.00
	(1-3)		-0.0274	0.0125 *	1.71	0.0151 *	1.89	0.0183 *	1.66	0.0307 **	2.32

Panel B: Sorted by 5-year Credit Default Swap (CDS) Spreads over 90 days post the filing date of financial reports																		
Fiscal Year	CDS Spread (%)			CAR(-1, +1)			CAR(-1, +2)			CAR(-1, +5)			CAR(-1,+10)					
	Group	N	Mean	Mean		t	Mean		t	Mean		t	Mean		t			
2005	1(lowest)	15	0.1498	-0.0017		-0.51	-0.0033		-0.74	-0.0103	**	-2.24	-0.0154	*	-1.98			
	2	16	0.2228	-0.0043		-0.91	-0.0037		-0.62	0.0030		0.60	-0.0028		-0.39			
	3(highest)	15	0.5595	0.0029		0.65	0.0044		0.84	0.0058		0.77	0.0013		0.15			
	(1-3)		-0.4097	-0.0046		-0.82	-0.0077		-1.12	-0.0161		-1.83	-0.0167		-1.41			
2006	1(lowest)	19	0.1126	0.0087	*	1.83	0.0145	**	2.55	0.0112	**	2.34	0.0007		0.14			
	2	19	0.2101	-0.0024		-0.57	-0.0013		-0.26	-0.0076		-1.29	-0.0182	**	-2.33			
	3(highest)	19	0.4170	0.0043		0.79	0.0044		0.71	0.0031		0.40	-0.0069		-0.59			
	(1-3)		-0.3044	0.0044		0.60	0.0101		1.19	0.0081		0.89	0.0076		0.59			
2007	1(lowest)	16	0.5984	-0.0138	**	-2.42	-0.0094		-1.57	-0.0142		-1.52	0.0052		0.31			
	2	17	1.1208	-0.0194	**	-2.53	-0.0240	**	-2.69	-0.0330	***	-3.11	-0.0344	**	-2.57			
	3(highest)	17	3.5422	-0.0577	***	-3.63	-0.0491	***	-3.30	-0.0818	***	-3.05	-0.1407	***	-4.75			
	(1-3)		-2.9438	0.0439	**	2.60	0.0398	**	2.48	0.0675	**	2.38	0.1460	***	4.29			

Table III: Univariate Analysis of Short Selling Activities Based on Exposures to the Subprime Market

Table III summarizes the univariate analysis of cumulative abnormal short selling activities over different event windows including (-10, -2), (-10, +10). Our results are robust for different window specifications. The results reported here are based on (-10, -2) window. The event is defined as the filing date of the annual reports of the financial firms for fiscal year end of 2005 2006 and 2007. We define abnormal short-selling by adjusting short-selling activities around the filing dates of financial reports by normal short-selling activities and then scale that measure by the number of shares outstanding, abnormal Short/SHROUT, or the average daily trading volume over the window (-120, -61), adjusted to change in number of shares outstanding, abnormal Short/Avol. We use three alternative measures for abnormal short selling. In the first definition, abnormal Short/SHROUT1, we define "normal" short selling benchmark as the contemporaneous median short selling activities ratio on the stock exchange of the financial firm. In the second definition, abnormal Short/SHROUT2, we define "normal" short selling benchmark as the mean short selling ratio of the financial firm over a 6-month period before and after the filing date but excluding event periods (-30,+30). In the third definition, abnormal Short/Avol, we define "normal" as the average short selling ratio over the period within 6 months before and after the filing date but excluding event period. The observations are sorted into three groups according to the subprime-to-assets ratios (Subprime) in each fiscal year. Group 1 and group 3 contain the observations with the lowest and the highest subprime-to-assets ratios, respectively. In addition to our three alternative measures of abnormal short selling we also include the cumulative contemporary raw short selling scaled by the outstanding shares. t-tests of short selling activities within each group and mean difference t-tests between group 1 and 3 are reported. * **, and *** indicate significance at 10%, 5%, and 1%, respectively. All variables in Table III are winsorized at 2 and 98 percentile.

Fiscal Year		Subprime		Cum. Short/SHROUT (%)			Cum. Abnormal Short/SHROUT1 (%)			Cum. Abnormal Short/SHROUT2 (%)			Cum. Abnormal Short/Avol (%)		
		N	Mean	Mean		t	Mean		t	Mean		t	Mean		t
2005	1 (lowest)	17	1.0000E-06	0.2497		---	-0.1643	**	-2.22	-0.1253	**	-2.30	-61.1035	**	-2.56
	2	16	0.0050	0.5150		---	-0.0674		-0.61	-0.1389	**	-2.45	-47.6669	**	-2.85
	3 (highest)	16	0.0836	0.4688		---	-0.0614		-0.53	-0.1362	*	-2.01	-23.1025		-0.75
	(1-3)		-0.0836	-0.2191		-1.30	-0.1028		-0.75	0.0109		0.13	-38.0010		-0.98
2006	1 (lowest)	25	7.2000E-05	0.5141		---	-0.0726		-0.84	0.0330		0.54	95.4233	***	2.94
	2	24	0.0066	0.7774		---	0.0492		0.31	0.1172		1.68	55.7368		1.50
	3 (highest)	25	0.1257	0.7058		---	0.0573		0.38	0.1047		0.98	43.3223		1.12
	(1-3)		-0.1256	-0.1917		-0.87	-0.1299		-0.75	-0.0716		-0.58	52.1010		1.03
2007	1 (lowest)	191	0	0.4710		---	0.1249	***	3.00	0.0286		1.07	-22.5233	**	-2.44
	2	19	0.0003	1.4500		---	0.6517	**	2.75	0.1349		1.01	14.3460		0.60
	3 (highest)	104	0.0272	1.2012		---	0.4584	***	4.93	0.2602	***	5.36	31.2382	**	2.37
	(1-3)		-0.0272	-0.7301	***	-5.06	-0.3335	***	-3.27	-0.2316	***	-4.18	-53.7614	***	-3.34

Table IV: Determinants of Cumulative Abnormal Short Selling Activities Using the Subprime Exposure

Table IV includes the regression analysis of determinants of cumulative abnormal short selling activities during the period form September 2005 to 17 September 2008 (one day before the short sale ban by the SEC). We employ a year fixed effect regression and the error term is clustered at the firm level. The dependent variable is cumulative abnormal short/SHROUT1 over window (-10, -2). Our results are robust for different window specifications. For example, we obtain similar results for (-10, +10) window. Option refers to the indicator variable which equals 1 if the firm has option trading within 3 months before and after the filing dates of annual reports and zero otherwise. Subprime refers to the subprime-to-asset ratio. Year_2006 and Year_2007 are two indicator variables of the fiscal year 2006 and 2007, respectively. Bank is an indicator variable that equals 1 if the financial firm is incorporated as a bank and 0 otherwise. CAPR1 refers to the Tier 1 Risk-Adjusted Capital Ratio.

Dependent Variable: Cumulative Abnormal Short Selling over Window (-10,-2)												
	Model I			Model II			Model III			Model IV		
	Coeff.		t	Coeff.		t	Coeff.		t	Coeff.		t
Size	0.2390	***	3.10	0.2361	***	2.90	0.2439	***	2.99	0.2332	***	2.94
Option	1.0176	***	2.90	1.2205	***	3.41	1.1600	***	3.26	1.0125	***	2.86
Subprime	2.1387		1.43	2.5994		1.57	---		---	---		---
Subprime ×Year_2007	---		---	19.0803	**	2.14	8.8628	**	1.99	19.3094	**	2.22
Subprime ×Year_2006	---		---	-2.2548		-1.52	0.1850		0.31	0.2552		0.43
Bank	---		---	0.7154	**	2.00	---		---	---		---
Bank×Capr1	---		---	-0.0258		-0.88	0.0210		1.21	---		---
Bank×Capr1×Year_2007	---		---	0.0092		0.29	---		---	---		---
Subprime ×Bank1×CAPR1×Year_2007	---		---	-1.1943	**	-1.93	---		---	-1.0046	*	-1.72
Year_2007	0.8573	***	5.08	0.7916	**	2.17	0.8249	***	5.21	0.7919	***	5.15
Year_2006	0.1056		0.65	0.2565		1.35	0.1966		1.16	0.1942		1.17
Constant	-2.4522	***	-4.36	-2.8888	***	-3.76	-2.7232	***	-4.20	-2.4134	***	-4.36
Observations	**436**			**426**			**426**			**426**		
Adjusted R-square	**0.297**			**0.326**			**0.312**			**0.317**		

Table V: Univariate Analysis of Short Selling Activities Based on CDS Spreads

In Panel A, we summarize the univariate analysis of short selling activities over windows (-10, -2) using three alternative measures of cumulative abnormal short selling as well as the contemporary cumulative short selling ratio, Cum. Short/SHROUT. The observations are sorted into three groups according to the 5-year CDS spreads over the 90 days post the filing of financial reports in each fiscal year. Group 1 and group 3 contain the observations with the lowest and the highest CDS spreads, respectively. t-tests of short selling activities within each group and mean difference t-tests between group 1 and 3 are reported.

In Panel B, we report the univariate tests for the one-year change in CDS spread just prior to the 2008 short-sale ban by the SEC. To compute the ΔCDS, for every firm, we calculate the average daily CDS for two periods: *t* and *t-1,* where *t* is the period from18 September 2007 to September 17, 2008 (one day prior to the short-sale ban) and *t-1* is the period from September 18, 2006 to September 17, 2007. The difference between CD_t and CD_{t-1} is the one-year change in CDS spreads (ΔCDS). We include three measures of short selling activities, including Cumulative Short/SHROUT ratios and Cumulative Abnormal Short/SHROUT1 ratios over the year before the announcement of the short selling ban (18 September 2008), as well as the change in Cumulative Short/SHROUT ratios (ΔCumulative Short/SHROUT), where ΔCumulative Short/SHROUT is the difference between the Cumulative Short/SHROUT$_t$ and the Cumulative Short/SHROUT$_{t-1}$. We first identify observation(s) with zero or negative ΔSpread as group 0, and then sort the remaining observations with positive ΔSpread into three groups. Group1 and 3 contains the lowest and highest ΔCDS Spreads, respectively. We also conduct t-tests on the mean of Cumulative Abnormal Short/SHROUT1 and ΔCumulative Short/SHROUT within each group and calculate the mean-difference tests between group1 (lowest positive ΔCDS) and group3 (highest positive ΔCDS). * **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Panel A: Sorted by 5year-CDS Spread over 90 day post the annual filing of the financial reports

Fiscal Year		CDS Spread (%)		Cum. Short/SHROUT (%)			Cum. Abnormal Short/SHROUT1 (%)			Cum. Abnormal Short/SHROUT2 (%)			Cum. Abnormal Short/Avol (%)		
		N	Mean	Mean		t	Mean		t	Mean		t	Mean		t
2005	1 (lowest)	15	0.1498	0.6426		---	-0.1819	*	-2.11	-0.0561		-0.84	-5.4963		-0.28
	2	15	0.2225	1.1053		---	0.3000		1.76	0.0014		0.01	3.7330		0.17
	3 (highest)	14	0.5769	1.4608		---	0.6770	***	3.94	0.0780		0.52	53.9936		0.94
	(1-3)		-0.4272	-0.8182	***	-4.12	-0.8590	***	-4.46	-0.1341		-0.81	-59.4899		-0.98
2006	1 (lowest)	18	0.1123	0.7369		---	-0.2355	**	-2.24	0.0110		0.22	14.9277		0.67
	2	18	0.2083	1.1283		---	0.1662		0.84	0.0836		1.45	22.8925		1.07
	3 (highest)	19	0.4170	1.4232		---	0.4411	**	2.64	0.0808		0.83	24.1881		0.77
	(1-3)		-0.3047	-0.6863	***	-3.33	-0.6766	***	-3.42	-0.0698		-0.64	-9.2603		-0.24
2007	1 (lowest)	14	0.5981	1.4389		---	0.1160		0.71	0.3366	***	3.95	68.7225	***	3.12
	2	17	1.1208	1.6957		---	0.3703	*	1.85	0.2722	**	2.68	50.4811	**	2.34
	3 (highest)	17	3.5422	2.6051		---	1.3425	***	4.16	0.4599	***	4.15	39.2102	***	4.24
	(1-3)		-2.9440	-1.1662	***	-3.19	-1.2264	***	-3.39	-0.1233		-0.88	29.5123		1.23

Panel B: Sorted by one-year ΔCDS spreads from 18, 2007 to September 17, 2008

	ΔCDS		Cum. Short/SHROUT (%)			Cum. Abnormal Short/SHROUT1 (%)			ΔCumulative Short/SHROUT (%)		
	# of Obs	Mean	Mean		t	Mean		t	Mean		t
0	1	-0.0004	0.1314		---	-0.2362		---	0.0356		---
1 (lowest)	18	0.0024	0.4866		---	0.1190	***	3.03	0.1441	***	3.70
2	19	0.0063	0.5104		---	0.1480	*	1.65	0.1765	***	4.66
3 (highest)	19	0.0292	1.2863		---	0.9536	***	3.92	0.7738	***	4.15
(1-3)		-0.0269	-0.7998	***	-3.17	-0.8346	***	-3.39	-0.6297	***	-3.31

Table VI: The Relationship between Cumulative Abnormal Short Selling Activities and the 5-year CDS Spread

Table VI shows the relationship between the short selling and both CDS spreads and ΔCDS spread. In Panel A, we compute the one-year change in the 5-year CDS Spread from September 18, 2007 to September 18, 2008. Then we employ multivariate regression analysis using two alternative measures of short selling. In models I and II, the dependent variable is annual cumulative Abnormal Short/SHROUT1 from September 18, 2007 to September 17, 2008 and, in models III and IV, the dependent variable is the change in one-year cumulative Short-selling from September 18, 2007 to September 17, 2008 (Δ Cum. Short/SHROUT1). The other control variables are as defined in Table IV. In Panel B, we compute the average 5-year CDS spread during the 90 days after the annual filing of financial reports for 2005 to 2007 fiscal year end. We employ year fixed effect regression and the error term is clustered at the firm level. The dependent variable is cumulative abnormal short/SHROUT1 over window (-10, -2). Our results are robust for different window specification, for example we obtain similar results for (-10, +10) window. The other control variables as defined in Table IV.

	Panel A: One-year ΔCDS spreads from 18, 2007 to September 17, 2008 (Cross-Sectional Tests)											
Dependent Variable	**One-year Cum. Abnormal Short/SHROUT1**						**One-year Δ Cum. Short/SHROUT**					
	Model I			Model II			Model III			Model IV		
Independent Variables	Coeff.		t	Coeff.		t	Coeff.		T	Coeff.		t
Size	0.0301		0.86	0.0274		0.70	0.0341		1.19	0.0237		0.74
Option	0.0273		0.15	0.0303		0.16	0.0247		0.16	0.0329		0.21
ΔCDS	0.3092	***	9.99	0.3070	***	9.60	0.2155	***	8.46	0.2141	***	8.18
Bank	---		---	0.5503		0.40	---		---	0.3605		0.32
Bank× CAPR1	---		---	-0.0662		-0.37	---		---	-0.0327		-0.22
Constant	-0.3456		-0.80	-0.3240		-0.70	-0.3129		-0.88	-0.2256		-0.60
Observations	**56**			**56**			**56**			**56**		
Adjusted R^2	**0.648**			**0.635**			**0.567**			**0.557**		

Panel B: 5-year CDS spread over 90 days post the filing of Annual Reports (2005 to 2007)						
Dependent Variable	**Cumulative Abnormal short/SHROUT1 over Window (-10,-2)**					
	Model V			Model VI		
Independent Variables	Coeff.		t	Coeff.		t
Size	0.0228		0.15	0.0117		0.07
Option	0.9046		1.50	0.9389		1.62
CDS Spread	0.7176	***	4.44	0.7114	***	4.60
Bank	---		---	6.4552	*	1.90
Bank× CAPR1	---		---	-0.7926	*	1.97
Bank×Capr1×Year_2007	---		---	0.0579		0.62
Year_2007	0.0311		0.10	-0.1291		0.40
Year_2006	-0.1494		0.69	-0.1171		0.54
Constant	-0.7061		0.42	-0.5636		0.30
Observations	**144**			**143**		
Adjusted R^2	**0.259**			**0.266**		