# Credit News around Seasoned Equity Offerings: Evidence from the Credit Default Swap Market *

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**Abstract**

In this paper we investigate the Credit Default Swap (CDS) market behaviour around Seasoned Equity Offerings (SEOs). We find that the CDS market is relatively efficient in incorporating the information impounded in the announcement of equity issues. According to the capital structure theory, we find that the most negative CDS market response is associated with SEO announcements of over-leveraged firms. We provide evidence that the reaction of the CDS spreads is also determined by leverage reduction, asymmetric information, and change in growth prospects.

*JEL classification*:

*Keywords*: seasoned equity offerings, credit default swaps, capital structure theory, leverage

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# Credit News around Seasoned Equity Offerings: Evidence from the Credit Default Swap Market


## Abstract

In this paper we investigate the Credit Default Swap (CDS) market behaviour around Seasoned Equity Offerings (SEOs). We find that the CDS market is relatively efficient in incorporating the information impounded in the announcement of equity issues. According to the capital structure theory, we find that the most negative CDS market response is associated with SEO announcements of over-leveraged firms. We provide evidence that the reaction of the CDS spreads is also determined by leverage reduction, asymmetric information, and change in growth prospects.



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# 1 Introduction

Security issuances often lead to large capital structure changes and contain important information about the firm's current value and financial condition, and its future prospects. Although the empirical research has mainly focused on the equity value impacts, there is a rather limited number of studies dealing with the effects on bondholders value. Our study aims to provide additional evidence in an effort to resolve the questions regarding the direction and the determinants of the credit market reaction around security issuance announcements. In this respect we rely on the information impounded in the Credit Default Swap (CDS hereafter) market. We focus on Seasoned Equity Offering (SEO hereafter) events as they typically result in large capital injections and high leverage changes[1].

The perception from the stock market's reaction investigation is that SEOs convey negative signals. According to Miller and Rock (1985), equity issuances convey negative information about current and future earnings. Myers and Majluf (1984) argue that, according to adverse selection theory, firms issue equity when the stock is overvalued. In both cases there is a negative stock market reaction.

However, there are two competing hypotheses about the expected effects of equity issuance on bondholders wealth. On the one hand, according to Miller and Rock hypothesis, the negative information about the firm value should be considered as negative news both by bondholders and CDS market investors. Consequently, this should affect positively the bond/CDS spreads. Kalay and Shimrat (1987) examine the SEOs during the 1970-1982 time period and report evidence supportive for this hypothesis. They find a significant bond price decrease around the day of the equity issuance announcement.

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[1] According to Merton (1974), firm's leverage is one of the two most important factors affecting credit risk pricing. The importance of leverage is empirically confirmed by the literature investigating the determinants of credit spreads variation. Among other studies, Collin-Dufrense et al. (2001), Avramov et al. (2007), Das et al. (2008), Ericsson et al. (2009), Zhang et al. (2009) include leverage proxies in their analysis of the determinants of credit spreads of the bond and the CDS market.

On the other hand, the leverage decrease that is associated with the equity issuance should reduce the reference entity's credit risk leading to bond price increases and CDS spread decreases. Eberhart and Siddique (2002) examine the period from 1980 to 1992 and find a significant increase in the bondholders wealth following SEOs, which is persistent for a five-year post-event period. They argue that this reaction indicates partial wealth transfer from bondholders to stockholders since it is associated with contemporaneous negative abnormal stock returns, and negative abnormal firm returns. The most recent study of Elliot, Prevost, and Rao (2009) find significant positive response of bondholders around SEO announcements but no evidence for wealth redistribution. They instead find support for the leverage risk reduction hypothesis.

We use the CDS market as a better benchmark for the credit-related information. First, we investigate the informational role of SEOs for the CDS pricing. Second, we examine the determinants of the CDS market reaction and the implications about the CDS market investors' perceptions. We find that the announcement of an SEO is on average associated with negative CDS market reaction. The median cumulative abnormal CDS change is -0.8% (t-stat = -2.36) for the [-1,+1] day event window. The pre- and post-announcement effects reveal that the negative reaction of the CDS market is consistent during the whole [-20,+20] day event window. We conjecture that no reversals of the CDS price around the announcement highlight the informational role of the SEOs for the credit derivatives market. Second, we find that the most important determinant of the CDS market response is the distance of the firm's leverage from its estimated target leverage, namely the relative leverage[2]. This is supportive for the tradeoff theory of capital structure. The second most important determinant is the analysts forecast dispersion which accounts for the information asymmetry between managers and shareholders.

Our results provide several contributions to the literature. First we provide additional evidence about the credit markets reaction around SEO announcements. Our findings are consistent with the study of Elliot, Prevost, and Rao (2009), and Eberhart

[2] We follow Flannery and Rangan (2006) partial adjustment model to estimate the target leverage. We provide a full description of the model in the Appendix.

and Siddique (2002), who find a positive effect of equity issue announcements on the bond prices. They are also partially consistent with the leverage risk reduction explanation provided by Elliot, Prevost, and Rao (2009). However, we provide evidence that the distance of firm leverage from its target leverage is more important than the leverage level. Moreover, we conclude that there is not strong evidence of wealth redistribution between the bondholders and the equityholders, although the reaction of both the CDS and the stock market is negative on average. Finally, we find the most negative reaction for firms characterized by high information asymmetry. This is consistent with the notion that high information asymmetry firms benefit more by issuing equity.

Second, we contribute to the literature investigating the efficiency of the CDS market around corporate events. The efficiency of the CDS market has been under thorough investigation since the early 2000s. The importance of this issue is permanently motivated both by the huge notional amounts traded in the CDS market, and also by its still over-the-counter nature. The novel study by Acharya and Johnson (2007) indicates that the efficiency of the CDS market, relative to the equity market, is event-driven[3]. Berndt and Ostrovnaya (2008) associate the CDS jumps with particular adverse firm-specific news. They find significant information flow from the CDS market to the equity market before lower-than-expected earnings or lowered forecasts, firm selling a unit or assets, and firm being a target of a leveraged buyout. The investigation of the CDS market response to scheduled or unscheduled events has also focused on earnings related information releases[4]. We provide additional evidence

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[3] Acharya and Johnson (2007) find that the CDS market leads the stock market during short-time periods before positive CDS jumps. Qiu and Yu (2012) provide support for the evidence found by Acharya and Johnson (2007) as well. Angelopoulos and Giamouridis (2013) argue that the relative efficiency of the CDS market is due to information rather than liquidity reasons. Moreover, it is evident even for smaller scale events.

[4] Callen, Livnat, and Segal (2009), Greatrex (2009), and Zhang and Zhang (2011), investigate the efficiency of the CDS market around earnings surprises. They agree that the CDS market anticipates negative earnings surprises and responds more strongly to negative than positive news. The evidence is more clear for lower rated firms. Furthermore, Batta, Qiu, and Yu (2012) find incremental information

regarding more regular capital structure change events, such as equity issuance, that are associated with leverage changes. This is an important contribution since leverage is theoretically and empirically one of the main determinants of credit risk pricing. Finally, we provide new evidence of significant negative CDS market reaction instances.

Third, we provide additional evidence for the association of the CDS spreads variation with the capital structure theories implications. Flannery, Nikolova, and Oztekin (2012) argue that bond credit spread changes incorporate information about future leverage changes that are due to bond or share issues, rather than due to future bond or share price movements. They find a significant relation between the expected leverage changes and alternative capital structure theories, with the tradeoff theory considered as the most robust. The importance of the expected leverage has been investigated in the CDS market as well. Elkamhi, Pungaliya, and Vijh (2012) find that both bonds and CDS spreads variation depend on the target leverage in addition to the actual leverage level. We follow an event study methodology, and examine the creditors reaction to the equity issues announcements. We enrich our analysis with the tradeoff theory of capital structure by investigating the expected leverage as a potential driver of the CDS market investors response.

The rest of this article is organized as follows. Section 2 presents the framework that we use to conduct our empirical analysis. Section 3 provides details on our data sources and the sample characteristics. Section 4 presents the results of our empirical analysis, and Section 5 concludes.

## 2 Empirical Methodology

We follow a common event study methodology to test the reaction of the stock and the CDS market around the announcement day of SEOs. In the next two sub-sections we describe the calculation of the cumulative abnormal price changes for each

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flow from the CDS market to the equity market during the periods before earnings announcements Shivakumar et al. (2011) find significant response of the CDS market to earnings forecast news that is even stronger than to actual earnings news.

market. In the last subsection we describe the univariate and multivariate analysis methodology that we follow to examine the determinants of the CDS market reaction.

### 2.1 Abnormal Stock returns

We use the single-index market model to calculate the abnormal stock returns. We set the estimation window as [-150,-20] and we run the following regression to estimate the expected stock returns:

$$R_t = a + \beta \times Rm_t + \varepsilon_t \quad (1)$$

In equation (1), *Rt* is the stock return of the firm that announces the SEO, and *Rm* is the return of the S&P500 index. We then calculate the abnormal stock returns (*AR*) as the difference between the daily stock returns and the daily estimated (expected) stock returns as follows:

$$AR_t = R_t - (a + \beta \times Rm_t) \quad (2)$$

Finally, we calculate the cumulative abnormal stock returns (*CAR*) for alternative time windows [$t_1$,$t_2$] as follows:

$$CAR(t_1, t_2) = \prod_{t=t_1}^{t_2} (1 + AR_t) - 1 \quad (3)$$

### 2.2 Abnormal CDS changes

Likewise, we calculate the cumulative abnormal CDS changes by running the following regression for the [-150,-20] day estimation window:

$$\Delta(CDS)_t = a + \beta \times \Delta(marketCDS)_t + \varepsilon_t \quad (4)$$

In equation (4), $\Delta(CDS)$ is the daily percentage change in the CDS spread, and $\Delta(marketCDS)$ is the daily percentage change in the CDS market index, which is defined as an equally-weighted average of all the daily single name CDS spreads. The abnormal CDS changes (*ASC*) are then calculated as:

$$ASC_t = \Delta(CDS)_t - [a + \beta \times \Delta(marketCDS)_t] \quad (5)$$

Finally, we calculate the cumulative abnormal CDS changes (*CASC*) for alternative time windows $[t_1,t_2]$ as follows:

$$CASC(t_1,t_2)=\prod_{t=t_1}^{t_2}(1+ASC_t)-1 \qquad (6)$$

### 2.3 Determinants of the CDS reaction

We use univariate and multivariate analysis to analyse the reaction of the CDS market. First, we divide our events sample into tercile sub-groups according the variable of interest. We then calculate the average and the median *CASC* as well as the percentage of negative and positive responses. We test the significance of the results by a sample t-test of means and medians respectively. We also calculate the difference in means and medians between the highest and the lowest tercile group of events. We test their significance by two-sample t-test and the Wilcoxon signed rank test, respectively.

Second, we run cross-sectional regressions of the following form to account for additional firm characteristics:

$$CASC_i = a + b_1 \times proxy + \sum_{k=2}^{n} b_k \times Control\_Variable_{k-1} + e_i \qquad (7)$$

In equation (7), *proxy* variable represents the alternative proxies we use to test the leverage hypothesis, the information signalling hypothesis, and the wealth transfer effects. There is a detailed description of these variables in Section 4. The *Control_Variable* represents the additional characteristics we account for in our analysis. We include the logarithm of market capitalization, the CDS spread, and the number of contributors of the daily CDS market quotes.

## 3 Data and Sample characteristics

We use the Securities Data Corporations (SDC) database files to collect information about SEOs. We use the filing date as the announcement day of the SEO.

We focus on common shares as the type of security issued and only on primary shares offered[5].

We match the SDC sample with firms with available CDS data in Markit database from 2004 to 2012. We focus on five-year CDS contracts denominated in US dollars with a modified restructuring document clause. For each SEO announcement we require available CDS spread observations for the alternative estimation and event windows around the event day. In addition, we require available market and fundamental data files in CRSP and Compustat, respectively. Finally, we source analysts' earnings-per-share (EPS hereafter) forecasts from Institutional Brokers' Estimate System (IBES) database files.

We use a number of filters to account for outliers and liquidity issues of the CDS market. First, we exclude observations with extreme CDS spread jumps, above 100%. Second, we exclude observations when the CDS spread has remained stable for more than five days in a 20-day rolling period. After applying the filters we end up with 216 SEO announcement events for 129 reference entities from 2004 to 2012.

**[Figure 1 about here]**

In figures 1A and 1B, we report the number of SEOs for the whole SDC sample and for the SDC-Markit matched sample. There is a total of 3,063 SEO announcements in the SDC database for the period 2004-2012. Only 216 instances are matched with available CDS data from the Markit database. Although they are very few to make inferences about the whole SEO events sample, they constitute a sufficient amount to be compared with the studies that examine the effects of the SEOs on the bondholders wealth. The most recent study of Elliot, Prevost, and Rao (2009) examines a sample of

[5] Secondary shares, as opposed to primary shares, are shares offered by firm insiders. Literature findings suggest different type of information impounded in primary versus secondary offers. We exclude 32 secondary offers that survive our matching and filtering procedures from our analysis.

99 separate firm/SEO announcements for 68 firms[6]. In figure 1B we observe higher SEO activity after the global financial crisis, which is mainly concentrated in 2009.

In Table 1, we report descriptive statistics for the SEO events-firms sample. Panel A presents the CDS variables descriptive results. The average (median) CDS spread for the reference entities that announce an SEO is 279.71 (170.95) basis points. The average (median) number of quote providers (No of Contributors) is 5.81 (5.00). We argue that our sample is liquid enough in terms of quote contributors since the most recent study of Qiu and Yu (2012) that uses the same proxy has a mean (median) of 7.2 (6). Panel B presents the firm characteristics. The median market value for our sample firms is 4,937.32 million. The corresponding median market value of the whole SDC sample firms of the same period is 585.63 (unreported). It follows that our sample is concentrated among large firms and our results are not in that sense absolutely comparable with the event studies that examine only the stock market reaction. Our sample firms are better in terms of net sales and market-to-book ratio. The median value of net sales (in millions) is 3,297.10 compared to the median value of each firm's industry median at the end of the fiscal year prior to the SEO announcement, which is 191.55 (unreported). Accordingly, our sample firms have a median market-to-book ratio of 1.43 compared to the corresponding industry median of 0.25. Finally, our firms are overleveraged in terms of total liabilities divided by total assets (median value is 42.42%) and long-term debt divided by total assets (median value is 37.05%) in comparison with the corresponding industry medians of 14.13% and 11.78%, respectively.

**[Table 1 about here]**

In Panel C, we report the analysts information. The average (median) EPS median forecast is 1.64 (1.39), whereas the average (median) change during the month of the SEO announcement is -0.02 (0.00). The average (median) forecast dispersion is 0.23

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[6] Our results are not absolutely comparable with other studies examining the bond markets due to differences in sample periods, in markets used as venue of credit related information, and in empirical approaches.

(0.09), and the average (median) number of estimates is 11.31 (10.00) for our SEOs sample. We find available IBES data for 200 out of 238 events, but we do not restrict our sample to the availability of analysts data.

Finally, in Panel D, we report the SEOs descriptive statistics. The median number of shares issued is 11.9 million, which represents a 7.15% percent of common shares outstanding. Likewise, the median amount of proceeds is 335.50, which represents 3.38% and 7.83% of total assets and long-term debt, respectively. In comparison with the whole SDC sample of the same period we find that, although there is a greater number of shares issued and amount of proceeds, they are lower when scaled by the common shares outstanding and the total assets or log-term debt, respectively. Consequently, our sample's events may have a lower importance from a capital structure change perspective.

# 4 Empirical Results

## 4.1 CDS and Stock market response to the SEO announcements

In the first part of the empirical analysis we examine the reaction of the CDS market around the day of the SEO announcement. In this respect, we intend to get additional insight from the CDS market investors reaction about the impact of SEOs on the bondholders value. As we already pointed out, there is not a conclusive evidence regarding the sign of the bondholders reaction, as denoted by the bond returns, and the implications about their perspectives for the equity issuance news arrival[7].

**[Figure 2 about here]**

Figures 2A and 2B show the median and the average reaction, respectively, of the CDS and the stock market for the [-20,+20] day event window. The figures depict that both markets react negatively to the announcement of the SEOs, which implies that stock markets regard SEOs as negative signals, whereas the CDS markets regard them

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[7] Eberhart and Siddique (2002) and Elliot et al. (2009) find positive abnormal bond returns around SEO announcements, whereas Kalay and Shimrat (1987) find negative abnormal bond returns.

as positive. It follows that either the two markets price the same piece of information differently, or that each market prices different aspect of information implied by the SEO announcement. Additionally, it is obvious that the reaction of the CDS market is consistent during the whole time window, whereas the stock market's reaction is concentrated in the short-time window [-2,+2] around the announcement of the SEO. The consistency of the CDS market reaction (no reversals) reinforces the informational role of the SEOs from a credit perspective. On the other hand, it raises doubts on the ability of the CDS market to incorporate the information of the SEOs in a timely fashion. We go through a more detailed analysis to test the significance and the implications of the CDS and the stock market reaction during, before, and after the announcement of the SEO.

#### 4.1.1 Announcement effects

We first report the CDS and the stock market reaction around the SEO announcements and then analyse the anticipation and the post-announcement effects.

**[Table 2 about here]**

In Table 2, we report the reaction of the stock and the CDS market for the [-1,+1] and [-1,0] day event windows. Panel A presents *CAR* results around the 216 SEO announcements. The average (median) stock price reaction is -2.65% (-1.91%) and -0.97% (-0.62%) for the two alternative announcement day event windows. The respective t-statistics are -5.86 (-5.83) and -2.80 (-3.24). The next two columns present the number and the percentage of negative versus positive reaction instances. There are 151 negative stock market reactions out of 216 events for the [-1,+1] day event window. The sign and the significance of the stock market reaction is consistent with the literature findings about the SEO effects on shareholders wealth. Our results are comparable in magnitude although our sample mainly contains large firms that belong both to the industrial and the financial sector[8],[9].

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[8] Elliot et al. (2009) argue that their lower abnormal stock market reaction finding is due to their sample of large firms.

Panel B presents *CASC* results around the SEO announcement days. The average CDS market reaction is -1.52% (t-stat = -2.38) and the median is -0.80% (t-stat = -2.35) for the [-1,+1] day event window. For the [-1,0] day event window only the median abnormal change is significant (-0.48%, t-stat = -2.02). There are 126 negative reaction instances out of 216 events for the [-1,+1] day event widow. The sign of the CDS market reaction implies that the SEO announcement is considered as good credit news on average by the CDS market investors. This is consistent with the findings of Elliot, Prevost, and Rao (2009) and Eberhart and Siddique (2002) who study the bondholders response.

In brief, the preliminary analysis of the stock and the CDS market reaction reveals some interesting points. First, the CDS market investors seem to be attentive during unscheduled corporate events, such as SEOs. Second, the CDS market is responsive to events that are favourable from the bondholders perspective, not only in the case of bad credit news, as it has currently been documented in the literature. Third, the negative stock returns along with the negative CDS changes raise potential questions regarding the wealth transfer effect hypothesis. We refer to all these issues in the following sections.

#### 4.1.2 Anticipation and Post-announcement effects

After identifying the announcement effects of SEOs on the stock and the CDS markets, we examine the behaviour of the markets before and after the announcement date. In this respect we explore how quickly the two markets incorporate the information of the SEO announcement.

**[Table 3 about here]**

In Table 3, we report the reaction of the equity (Panel A) and the CDS (Panel B) market for the [-20,-2] and [+2,+20] day event windows. Both the average and the median anticipation *CAR*s are small and insignificant. The same holds for the post-

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[9] Most of the SEO event studies that examine the stock market response exclude financial firms. However, we find similar results for the stock market reaction even including financials in our analysis.

announcement effects. On the other hand, there is a significant anticipation from the CDS market. The median *CASC* equals -1.53% (t-stat = -2.05) and there is a 57.41% percentage of negative response instances (124 out of 216 events). In the case of post-announcement effects, there is a slightly smaller negative median change in the CDS spreads (-1.32%) for the [+2,+20] day event window which is insignificant (t-stat = -1.45). There is a lower percentage of negative instances (54.03%) as well.

The most interesting finding is that the reaction of the CDS market is consistent during the whole time window around the event. The fact that there are no CDS spread reversals strengthens the positive informational role of the SEO news from a credit risk perspective. This is the first evidence of the attentiveness of the CDS market investors regarding positive credit news. Second, the anticipation and the post-announcement results provide preliminary evidence that the CDS market anticipates the SEO announcements, whereas there is no significant anticipation from the equity markets. Moreover, there is not a significant effect for the post-announcement period, which indicates that both markets timely incorporate the information of the SEO announcement. In the next section we examine if the efficiency of the CDS market is concentrated among certain instances.

### 4.2 Determinants of the CDS market reaction

Kalay and Shimrat (1987) argue that the credit markets may react to the SEO announcements due to the corporate leverage decrease, or due to the expected firm value changes[10]. Elliot, Prevost, and Rao (2009) find that bondholders' wealth increases due to the leverage risk reduction hypothesis. Since leverage is one of the main determinants of CDS spreads variation, in the first part of this section we focus on the examination of the leverage effect of the SEO announcements on the CDS spread changes. In the second and third sections we test the information signalling and the wealth transfer hypothesis, respectively. We divide our sample events into sub-groups according to proxies that have been proposed by similar studies to test each hypothesis.

[10] These are determined by the expectations about the future growth prospects.

In the fourth section we go through a multivariate analysis to examine the contemporaneous effects of the hypotheses and to account for other control variables.

### 4.2.1 Leverage Hypothesis

We first follow the study of Elliot, Prevost, and Rao (2009) and use the firm's[11] credit rating score to test if there is different reaction for Investment Grade (IG) and High Yield (HY) reference entities' SEOs. According to the leverage hypothesis, we expect more significant reaction for the lower rated firms. In Panel A of Table 4, we report the CDS market reaction for the [-1,+1] day event window. The average *CASC* is -1.80% (t-stat = -3.07) for the IG sample, and -2.31% (t-stat = -2.56) for the HY sample. The median *CASC* is marginally significant for the IG sample (-0.69%, t-stat = -1.65), and more significant for the HY sample (-1.44%, t-stat = -1.90). Moreover, there is a 55.77% negative reaction for the IG sample (87 negative cases out of 156 events), and a 68.18% negative reaction for the HY sample (30 negative cases out of 44 events). Although the p-values (0.42 and 0.26) for the differences in means and the medians do not indicate a significantly different reaction for the two groups of events, the higher level of the negative reaction and the higher significance for the HY sample provides a first indication for the leverage risk reduction hypothesis. However, it is worth mentioning that the CDS reaction is relatively high and significant enough for the IG sub-group of events, which is not entirely consistent with the findings of Elliot, Prevost, and Rao (2009) who find no significant bond returns for their IG sub-sample.

**[Table 4 about here]**

In panels C and B we report the anticipation and the post-announcement effects on the CDS spreads, respectively. For the [-20,-2] day event window the reaction is more intense for the IG sub-group, although the difference of the reactions between the two sub-groups is not statistically significant. The median *CASC* is -2.90% (t-stat = -2.67), whereas the median HY sub-group *CASC* is -0.37 (t-stat = -0.23). Additionally, there is a higher percentage of negative reactions for the IG group, i.e. 60.26% of the responses are negative, in comparison with 52.27% negative responses for the HY sub-

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[11] Elliot et al. (2009) use each bond's rating for their analysis.

group. On the other hand, there are no significant reactions for the two sub-groups during the period after the announcement. The HY sample has a more intense response (-1.21% versus -0.74% for the IG sample), but it is not statistically significant. The anticipation results are not consistent with the leverage hypothesis, since we would expect the CDS market participants to be more attentive in the case of lower rated firms.

Since credit ratings cannot be considered as a pure leverage proxy[12,13], we next use alternative leverage and leverage change proxies. We report the results in Table 5. We test the leverage risk reduction hypothesis by focusing on leverage level (book leverage defined as the sum of long-term debt and debt in current liabilities divided by the book value of assets), relative leverage level (defined as the distance of the firm's leverage level from its target leverage), and leverage change (defined as the proceeds from the SEO divided by the amount of long-term debt). We sort the SEO events into terciles according to each leverage and leverage change proxy and report the CDS market reaction (mean and median), the number of the negative and the positive cases, and the difference between the third and the first group of events.

The first five columns of Panel A refer to the book leverage. The leverage hypothesis is more pronounced in the median reactions which are -1.22% (t-stat = -1.82) and -0.47% (t-stat = -0.71) for the high and the low book leverage group respectively. The difference between the high and the low leverage group is insignificant for both the average and the median reaction.

**[Table 5 about here]**

The most recent literature findings indicate that the target leverage plays an equally important role for the CDS variation as does the leverage level. In this respect we examine the CDS market reaction after sorting the SEO events according to the relative leverage of the reference entity. The relative leverage is defined as the distance

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[12] Gamba and Sarreto (2012) argue that there is great leverage variation within same credit rating categories.

[13] Most of the CDS event studies find that the CDS investors are more responsive for lower-rated firms' corporate news, without associating this evidence with the leverage hypothesis.

of the actual market leverage from its target leverage. We use the partial adjustment model of Flannery and Ragan (2006) to estimate the target leverage[14]. In the second five columns of Panel A, we report the CDS market reaction for the relative leverage groups of SEOs. The average and the median abnormal CDS reaction is negative and significant for the high relative leverage groups (-4.46%, t-stat = -3.44, and -1.89%, t-stat = -1.72), whereas it is positive and insignificant for the low relative leverage groups. The average (median) high-low difference is -6.04% (-2.39%) and significant with pvalue = 0.02 (0.02). It follows that SEO announcement is considered as better credit news when the firm conducting the SEO is currently overleveraged.

In the third five columns of panel A, we report the CDS market reaction for leverage change terciles. The median *CASC* is -1.17% (t-stat = -2.12) for the third tercile, i.e. the group of events with the higher amount of proceeds divided by the amount of long-term debt. Although the difference between the high and the low leverage change groups is not statistically significant, this is one more weak support for the leverage risk reduction hypothesis.

In panels B and C of Table 5, we examine the variation of the anticipation and the post-announcement effects according to the leverage proxies. In panel B we report the anticipation results for the [-20,-2] day event window. We expect the CDS market to anticipate the equity issuances by highly levered firms (in terms of book leverage and relative leverage) and firms with higher decreases in their leverage (in terms of SEO proceeds amount). However, we find that there are no significant anticipation effects for the higher leverage and change-in-leverage groups. In contrast we find that the median *CASC* is significant for the low book leverage tercile (-3.39%, t-stat = -2.24) and for the lowest proceeds tercile (-4.43%, t-stat = -3.19). In panel C, we report the post-announcement effects. The reaction of the CDS market seems to be more intense in the highest relative leverage tercile. The median *CASC* is -2.56% (t-stat = -1.72) and the percentage of negative instances is 65.9%.

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[14] See the Appendix. Relative Leverage calculation for the definition and the estimation of the partial adjustment model proposed by Flannery and Rangan (2006).

To conclude, we find evidence that the reaction of the CDS market around the SEO announcements is partially consistent with the leverage risk reduction hypothesis. However, the implications are not similar with the study of Elliot, Prevost, and Rao (2009) who examine the bond market reaction. Interestingly, we find that the CDS reaction is mostly determined by relative leverage. This means that the equity issues for the firms that are overleveraged is regarded as significantly better credit news by the CDS market. This is consistent with the literature that examines the dependence of the credit spreads on target leverage. It is an indication that the capital structure theories can be used as explanatory aspects in the case of the CDS market. Finally, we find that the CDS market does not seem to anticipate the SEO announcements in the case of highly levered firms.

### 4.2.2 Information signalling hypothesis

The information signalling hypothesis has been proposed as the most important in the case of the stock market reaction to the SEO announcement. According to Miller and Rock (1985), equity issuances convey negative information about current and future earnings. Myers and Majluf (1984) argue that firms issue equity when the stock is overvalued. In both cases there is a negative stock market reaction. Elliot, Prevost, and Rao (2009) argue that if the cash flow signalling model of Miller and Rock (1985) holds, we would expect *CASC* to be positively associated with larger offerings, i.e. higher amounts of proceeds. On the other hand, the adverse selection model of Myers and Majluf (1984) does not make any implications for the bondholders/creditors reaction. We argue that if the SEOs affect both the leverage and the expected cash flows, there would be an offset between the positive and the negative relationship of the proceeds amount with the response of the CDS market.

In this respect we use alternative expected future cash flow proxies to examine the information signalling hypothesis. Specifically, we sort our events according to the EPS median forecast change during the month of the SEO announcement as an indication of the growth prospects of the firm as regarded by the equity analysts, in the spirit of Bradley and Yuan (2013). Additionally, we use market-to-book ratio, which is considered as a growth opportunities proxy. Finally, we use the analyst forecast dispersion as an information asymmetry proxy. We report the results in Panel A of Table 1Table 6.

The first five columns present the CDS market reaction for tercile groups of events that are sorted according to the change in the median analyst EPS forecast. We find a more negative response of the CDS market for the events that are considered by the analysts as increasing the firm's growth prospects. The difference of the median *CASC* between the highest and the lowest tercile group is -1.19% and is significant at the 5% level (p-value = 0.02). These findings indicate that the CDS market reaction agrees with the perception of equity analysts about the expected operating performance of the reference firms. The second five columns present the results for the SEOs sorted by the market-to-book ratio. We find a more negative response of the CDS spreads for the firms with higher market-to-book ratio. The median *CASC* of the highest tercile group is -1.19% and it is significant at the 5% level (t-stat = -2.21). Although the difference between the highest and the lowest group *CASCs* is not significant, the CDS market seems to consider the growth options of the reference entity as important.

The first five columns present the CDS market reaction for tercile groups of events that are sorted according to the analysts' forecast dispersion. We find a significant negative difference (-1.98%, p-value = 0.01) between the median *CASC* of the highest tercile group, i.e the group that exhibits the highest information asymmetry, and the lowest tercile group, i.e. the group that exhibits the lowest information asymmetry. These results indicate that the CDS market considers the equity issuance as more favourable for firms with high information asymmetry. This is consistent with the findings of Autore and Kovacs (2010) who argue that firms with higher information asymmetry have more to gain from equity issuance decisions.

**[Table 6 about here]**

Panels B and C of Table 6 report the pre- and post-announcement response of the CDS market. We find a more intense anticipation of the SEO announcement for firms with the highest positive change in the EPS median analyst forecast and for the lowest market-to-book ratio. For the post-announcement period we find significant negative *CASCs* only for the group of events with the lowest market-to-book ratio. Additionally, we find a highly negative pre-announcement median *CASC* for firms with very low and very high information asymmetry, as it is proxied by the analysts forecast dispersion.

To conclude, we find first indications that the CDS market considers the growth prospects of the firm in the case of SEOs. More accurately, we find that the perception of the CDS market investors agrees with the perception of equity analysts. Moreover, we find that the CDS market investors consider the SEO announcement as better credit news in the case of high information asymmetry. This is in line with the study of Autore and Kovacs (2010), who argue that firms with higher adverse selection costs have more to gain by issuing equity. In the multivariate analysis we explore which of the previous findings are robust to the inclusion of additional firm characteristics.

### 4.2.3 Wealth transfer effects

As Kalay and Shimrat (1987) argue, it is important to examine whether SEOs lead to wealth redistribution from stockholders to bondholders. Eberhart and Siddique (2002) find evidence for wealth redistribution between the bondholders and the shareholders of the firm when they examine the long-term performance of the bond and the stock markets after the announcement of the SEOs. On the other hand, Elliot, Prevost, and Rao (2009) and Kalay and Shimrat (1987) find no evidence of wealth transfer effects. Since this matter is accompanied with the capital structure decisions theories, we test if the bondholders earn value at the expense of the shareholders. The contemporaneous negative average abnormal returns for the stock and the CDS market around SEOs would indicate the presence of a wealth transfer effect. We thoroughly examine this hypothesis by sorting the SEOs according to the sign of the abnormal stock returns and the abnormal CDS changes. Panel D of Table 6 presents the results.

In the first five columns we report the average and the median abnormal stock returns for the positive and the negative CDS market reaction groups. The average (median) stock market reaction is -3.39% (-1.74%) with a t-statistic equal to -5.19 (-3.92) for the case of positive CDS market reaction. It is also negative and significant for the cases of negative CDS market reaction. Accordingly, in the next five columns we report the average and the median abnormal CDS changes for the positive and the negative stock market reaction groups. The CDS market reaction is negative and significant when there is a positive stock market reaction, whereas it is still negative but insignificant when there is a negative stock market reaction around the SEO event. These results do not support the wealth transfer hypothesis. This is consistent with the findings of Elliot, Prevost, and Rao (2009). We further examine the wealth transfer hypothesis in the multivariate analysis.

#### 4.2.4 Multivariate analysis

In this section we examine the relationship between the CDS market response around the SEO announcements with the variables used in the previous analysis along with additional control variables.

**[Table 7 about here]**

In Table 7, we report the results of cross-sectional quantile regressions of equation (7). In equation (7), $CASC_i$ is the cumulative abnormal CDS change for the [-1,+1] day event window for event *i*, $proxy$ is the variable of interest according to the hypothesis examined. These are the proxies previously used for the leverage hypothesis, the information signaling hypothesis, and the wealth transfer effect. Finally, we use the logarithm of market value, the CDS spread, and the number of contributors as additional control variables ($Control\_Variable$). Throughout columns (1) to (3) we report the results for the leverage risk reduction hypothesis. We find that only relative leverage (column 2) is significant determinant of the cross-sectional variation of the CDS market response. The coefficient is negative (-0.218) and statistically significant at the 5% level (t-stat = -2.38). Accordingly, columns (4) to (6) refer to the information signaling hypothesis. We find that only the proxy of information asymmetry, i.e. the analysts forecast dispersion is significant. The coefficient (-0.028) indicates that the events that are characterized by the most information asymmetry are considered as the most favorable from the credit market perspective. Finally, in column (7) we find that there is no wealth transfer effect. The significant negative (coefficient is -0.198, t-stat = -2.07) relationship between *CASC* and *CAR* actually indicates the opposite. From the control variables used in the cross-sectional regressions, only the CDS spread is significant in some cases.

To conclude, the multivariate analysis provides further support to the results presented in the previous section. The response of the CDS market investors to the announcement of an SEO seems to be associated with both the leverage hypothesis (relative to the target leverage of the firm) and the information signalling hypothesis.

## 5 Conclusion

We investigate the response of the CDS market around SEO announcements. The motivation of this study is twofold. First, there are only a few studies examining the effects of the SEOs on bondholders wealth. We use the CDS market instead of the bond market since it is evident that the CDS market is more liquid and serves as a better benchmark for the credit related information regarding the timeliness of the information incorporation. Moreover, there is not a conclusive evidence both for the sign and the determinants of the bondholders reaction. Second, there is a growing concern about the efficiency and the reaction of the CDS market around scheduled and unscheduled corporate events. Here we focus on the equity issuance, which constitutes an important change in a firm's capital structure.

We go through an event study methodology and find that the CDS market response to SEO announcements is negative and significant. After investigating the anticipation and the post-announcement effects, we conclude that there are no CDS spread reversals, meaning that SEOs can be considered as informational and not liquidity driven. However, we do not find that the CDS market anticipates these events when they seem to be more important from its investors perspective. Our results provide support for the attentiveness of the CDS market around corporate events. In addition, we are the first to find that the CDS market is responsive even in the case of good credit news.

The analysis of the determinants of the CDS market reaction provides several interesting aspects. First, we find that leverage risk reduction is partially priced by the credit markets, which is consistent with the study of Elliot, Prevost, and Rao (2009). However, we find that the most important factor from the CDS market perspective is the relative leverage, i.e. the distance of the firm's leverage from its target leverage. In this respect, we find that the CDS market considers SEOs as good credit news mostly when the firm is overleveraged. Second, we report weak evidence for the information signalling hypothesis. We find that the CDS market agrees with equity analysts' consideration about the firm's growth prospects. Finally, the CDS investors regard SEOs as good credit news mostly when there is a great information asymmetry, as it is captured by the analysts forecast dispersion.

## Appendix. Relative Leverage calculation

We use the distance of the firm's leverage level from its optimal leverage target, namely the relative leverage as defined by Ippolito, Steri, and Tebaldi (2012), as an alternative proxy for the leverage hypothesis examination. In this respect we use the partial adjustment model of Flannery and Rangan (2006) to estimate the expected leverage[15].

### 1. Partial adjustment model definition

The tradeoff capital structure theory suggests that firms select a capital structure that maximizes their value after accounting for the costs and benefits of debt. In the presence of adjustment costs, the actual debt ratio may deviate from the optimal debt ratio. A standard partial adjustment model that accounts for the target leverage and the speed of adjustment to the target leverage ($\lambda$) is described by the following equation:

$$MDR_{i,t+1} - MDR_{i,t} = \lambda(MDR^{*}_{i,t+1} - MDR_{i,t}) + \varepsilon_{i,t+1} \tag{8}$$

where $MDR$ is the ratio of the value of interest-bearing debt (the sum of long-term debt and debt in current liabilities, as denoted by Compustat annual data items #9 and #34, respectively) to the sum of interest-bearing debt and the market value of equity (the number of common shares outstanding multiplied by the price per share, as denoted by Compustat annual data items #25 and #199, respectively) .

[15] The model has been examined and used by many studies. We report Faulkender et al. (2012), Flannery, Nikolova, and Oztekin (2012), Huang and Ritter (2009), Lemmon at al. (2008), among others.

The proxy of the firm's following year target leverage is denoted by $MDR^{*}_{i,t+1}$ and is considered as a function of a set of firm *i*'s fundamental characteristics ( $X_{i,t}$ ):

$$MDR^{*}_{i,t+1} = \beta X_{i,t} \tag{9}$$

The $X_{i,t}$ set contains variables that are considered, and have empirically been found, as important by the literature covering the examination of the tradeoff theory of capital structure. We use the conventional set of variables used by similar studies:

*EBIT_TA*: Earnings before interest and taxes divided by total assets

*MB*: Market-to-book ratio

*LnTA*: logarithm of total assets

*FA_TA*: fixed assets divided by total assets

*R&D_Dum*: dummy variable that equals one when the firm does not report R&D expenses

*R&D_TA*: R&D expenses divided by total assets

*Ind_Median*: the median MDR of the sector the firm belongs to. We use the Standard Industry Classification (SIC) 2-digit codes to classify firms into industries

The partial adjustment model is derived by both equations (8) and (9) and has the following form:

$$MDR_{i,t+1} = (\lambda\beta)X_{i,t} + (1-\lambda)MDR_{i,t} + \varepsilon_{i,t+1} \tag{10}$$

The parameter $\lambda$ represents the percentage reduction of the distance between the actual firm's leverage level from its estimated target leverage that occurrs over one period.

## 2. Partial adjustment model estimation

According to Flannery and Hankins (2013), the best technique to estimate equation (10) is the Blundell and Bond's (1998) GMM system. We use this GMM approach along with pooled OLS estimates and Least Squares Dummy Variable (LSDV) estimates. We use data from the Compustat annual files for the period 1988 to 2012. The estimation results are presented in Table 8. Columns (1) to (3) report the results from our three alternative estimation techniques.

**[Table 8 about here]**

Focusing on column (3) which presents the estimation results of Blundell and Bond’s (1998) GMM system, we find a good model fit and a speed of adjustment of 27.4% ($\lambda$ = 1-0.726). As a result the model implies that the firms move by 27.4% on average towards their corresponding target leverage within one year. The speed of adjustment value is similar to other studies estimations, such as Faulkender et al. (2012), Flannery and Rangan (2006), Flannery, Nikolova, and Oztekin (2012), Ippolito, Steri, and Tebaldi (2012), Leary and Roberts (2005), Lemmon, Roberts, and Zender (2008), among others. Moreover, most of the estimated coefficients carry expected signs and scale similar to the studies mentioned above.

Finally, we follow the study of Ippolito, Steri, and Tebaldi (2012) to calculate the relative leverage:

$$Relative\_Leverage_{i,t} = MDR_{i,t} - \hat{MDR}^{*}{}_{i,t}$$

Where $Relative\_Leverage_{i,t}$ is firm’s *i* distance of actual leverage ratio ($MDR_{i,t}$) from its target leverage ratio ($\hat{MDR}^{*}{}_{i,t}$) as it is estimated by the partial adjustment model presented above.

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**Figure 1A: SEOs of SDC with available CRSP and Compustat files**

This figure shows the number of SEOs in the SDC database with available CRSP and Compustat files from 2004 to 2012.

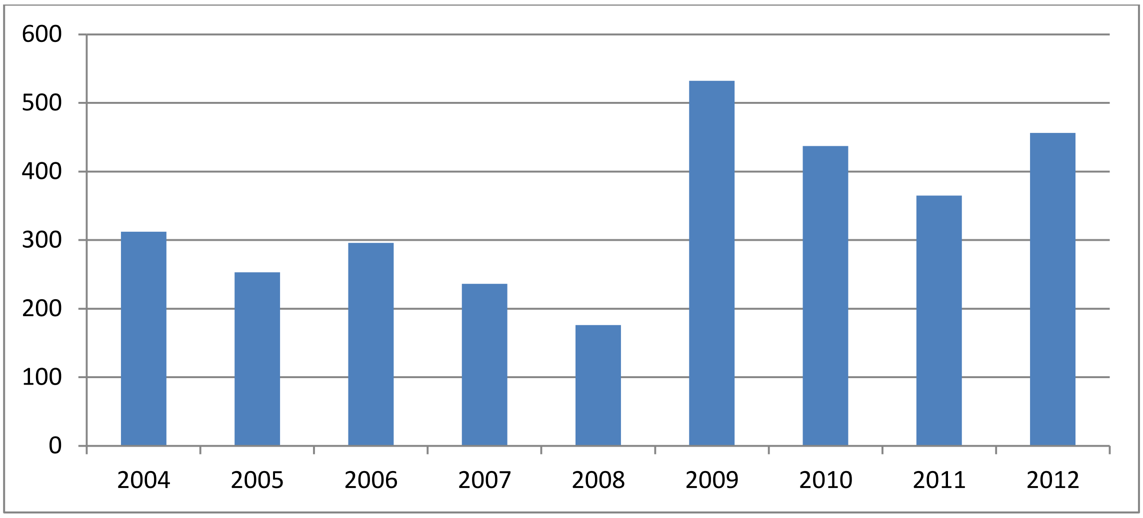


**Figure 1B: SEOs of SDC with available CRSP and Compustat and Markit files**

This figure shows the number of SEOs in the SDC database with available CRSP, Compustat, and Markit files from 2004 to 2012.

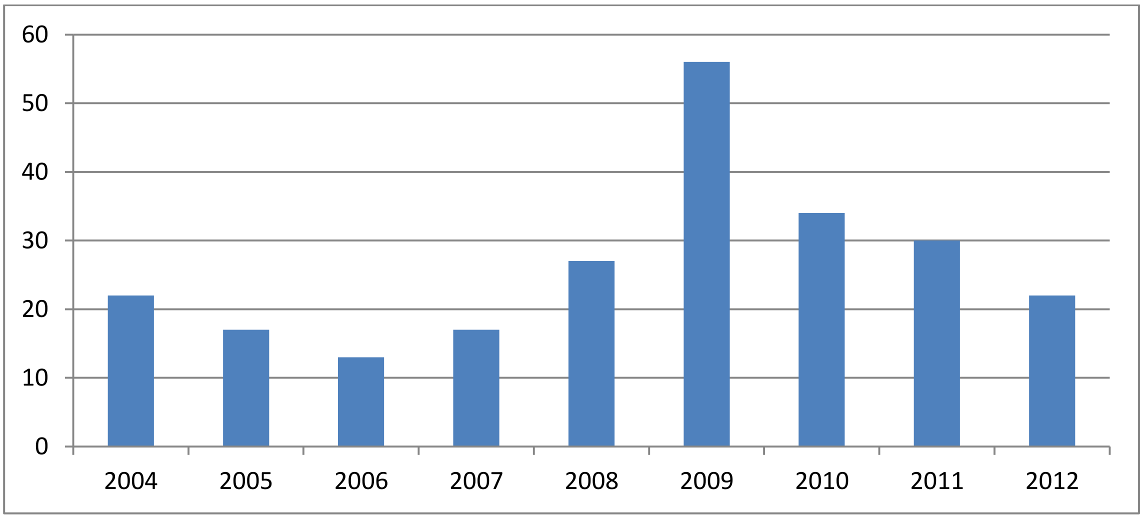

**Figure 2A: Cross-sectional median abnormal CDS and stock market reaction**

This figure shows the median abnormal cumulative price changes during the [-20,+20] day event window. The blue line refers to the CDS spread changes and the red line refers to the stock market returns.

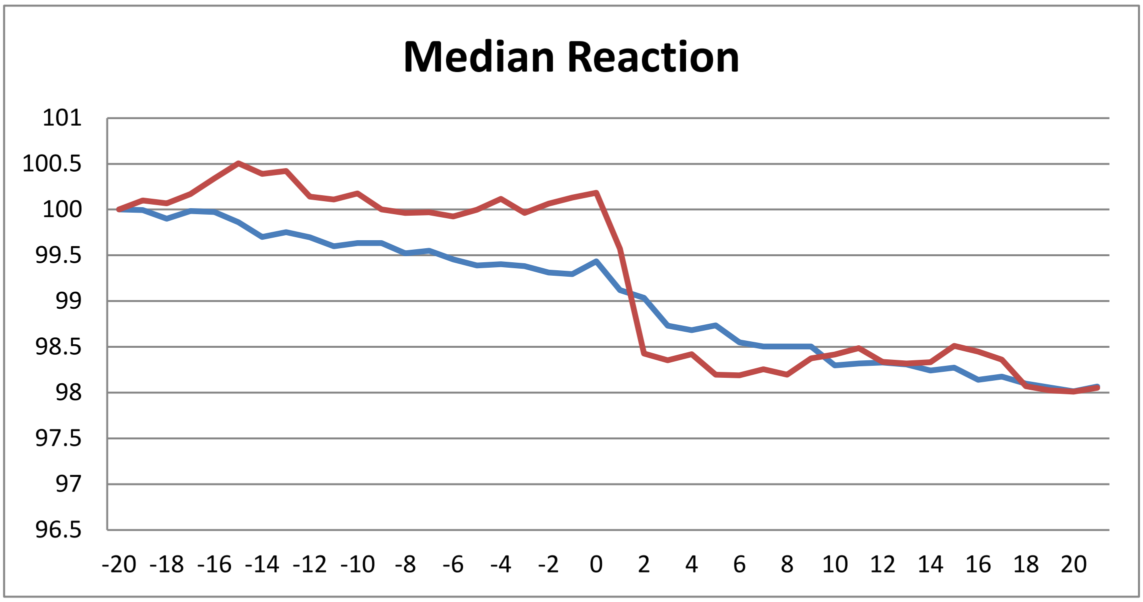


**Figure 2B: Cross-sectional average abnormal CDS and stock market reaction**

This figure shows the average abnormal cumulative price changes during the [-20,+20] day event window. The blue line refers to the CDS spread changes and the red line refers to the stock market

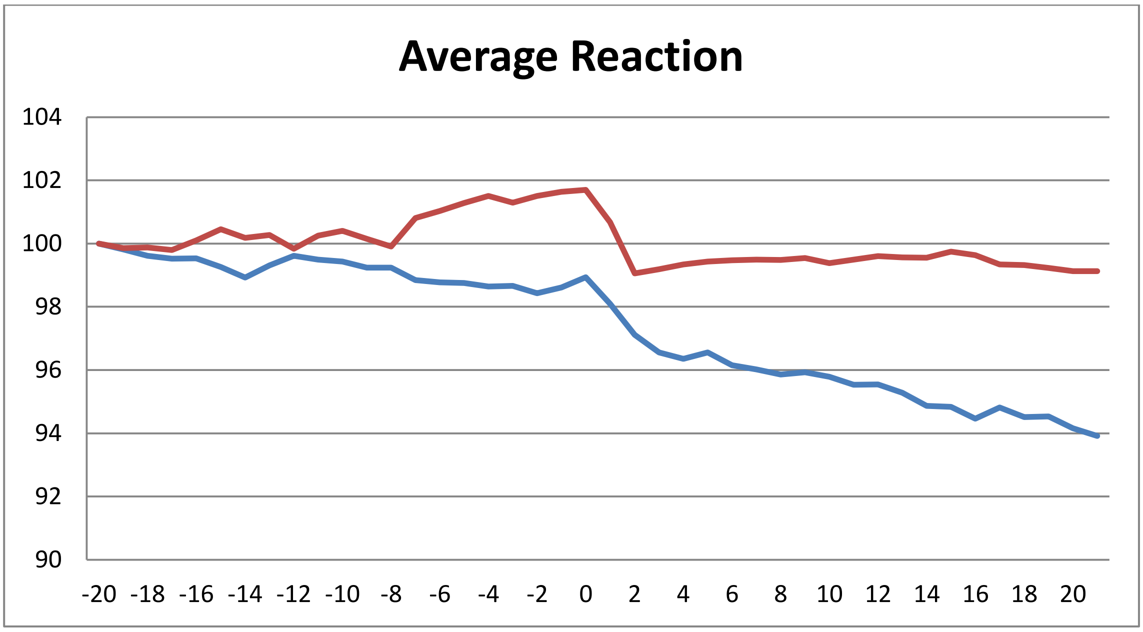

**Table 1: Firm-Event Descriptive Statistics**

This table reports descriptive statistics for the sample of SEOs and firms used in this study. Panel A presents CDS market characteristics of the reference entities involved in the SEOs. The CDS spread and the number of Markit quote contributors are reported. Panel B presents firm descriptive statistics, i.e. market value, net sales, return-on-equity (ROE), total liabilities divided by total assets, long-term debt divided by total assets, and market-to-book ratio. Panel C presents analysts' estimates statistics, i.e. forecast dispersion, EPS median forecast, change in the EPS median forecast during the month including the SEO announcement day, and the number of estimates. Panel D presents the SEO descriptive statistics, i.e. the number of shares issued, the shares percentage defined as the shares issued divided by the common shares outstanding, the SEO proceeds, the SEO proceeds divided by total assets, and the SEO proceeds divided by long-term debt.

| | Mean | Median | Min | Max | Count |
|---|---|---|---|---|---|
| *Panel A: CDS Market (Markit)* | | | | | |
| CDS Spread | 279.71 | 170.95 | 10.55 | 3236.35 | 238 |
| No of Contributors | 5.81 | 5.00 | 2.00 | 25.00 | 238 |
| *Panel B: Firm Descriptives (CRSP & Compustat)* | | | | | |
| Market Value | 14050.20 | 4937.32 | 74.05 | 370240.30 | 237 |
| Net Sales | 11427.70 | 3297.10 | -288.95 | 169719.00 | 237 |
| ROE (%) | 27.42% | 14.05% | -133.91% | 2637.93% | 237 |
| Total Liabilities / Total Asssets | 41.68% | 42.42% | 0.00% | 100.17% | 237 |
| Long-term debt / Total Assets | 35.66% | 37.05% | 0.00% | 96.28% | 238 |
| Market-to-Book | 2.16 | 1.43 | -4.94 | 102.27 | 237 |
| *Panel C: Analysts Descriptives (IBES)* | | | | | |
| Forecast Dispersion | 0.23 | 0.09 | 0.01 | 2.87 | 200 |
| EPS Median Forecast | 1.64 | 1.39 | -3.98 | 11.00 | 212 |
| Δ(EPS Median Forecast) | -0.02 | 0.00 | -3.42 | 7.06 | 212 |
| Number of Estimates | 11.31 | 10.00 | 1.00 | 34.00 | 212 |
| *Panel D: SEOs Descriptives (SDC)* | | | | | |
| Number of Shares | 27.66 | 11.90 | 1.53 | 407.50 | 238 |
| Shares Percentage | 10.31% | 7.15% | 1.17% | 71.70% | 238 |
| SEO Proceeds | 889.45 | 335.50 | 3.21 | 12189.11 | 238 |
| SEO Proceeds / Total Assets | 4.53% | 3.38% | 0.07% | 44.46% | 238 |
| SEO Proceeds / Long-term Debt | 12.87% | 7.83% | 0.13% | 173.86% | 236 |

**Table 2: Abnormal Stock and CDS market reaction: Announcement effect**

This table presents the mean and median cumulative abnormal price changes for the [-1,+1] and [-1,0] day event windows, the corresponding t-statistics for the sample t-tests, the number and the percentage of negative and positive changes, and the number of events. Panels A and B present the results for the stock (*CAR*) and the CDS (*CASC*) market, respectively.

*Panel A: Stock Abnormal Returns (CAR)*

| | | Mean | Median | Negative / % | Positive / % | Events |
|---|---|---|---|---|---|---|
| [-1,+1] | CAR | -2.65% | -1.91% | 151 | 65 | 216 |
| | t-stat | -5.86 | -5.93 | 69.91% | 30.09% | . |
| [-1,0] | CAR | -0.97% | -0.62% | 124 | 92 | 216 |
| | t-stat | -2.80 | -3.24 | 57.41% | 42.59% | . |

*Panel B: CDS Abnormal Changes (CASC)*

| | | Mean | Median | Negative / % | Positive / % | Events |
|---|---|---|---|---|---|---|
| [-1,+1] | CASC | -1.52% | -0.80% | 126 | 90 | 216 |
| | t-stat | -2.38 | -2.35 | 58.33% | 41.67% | . |
| [-1,0] | CASC | -0.65% | -0.48% | 123 | 93 | 216 |
| | t-stat | -1.22 | -2.02 | 56.94% | 43.06% | . |

**Table 3: Abnormal Stock and CDS market reaction: Anticipation and Post-announcement effects**

This table presents the mean and median cumulative abnormal price changes for the [-20,-2] and [+2,+20] day event windows, the corresponding t-statistics for the sample t-tests, the number and the percentage of negative and positive changes, and the number of events. Panels A and B present the results for the stock (*CAR*) and the CDS (*CASC*) market, respectively.

| *Panel A: Stock Abnormal Returns (CAR)* | | | | | | |
|---|---|---|---|---|---|---|
| | | Mean | Median | Negative / % | Positive / % | Events |
| [-20,-2] | CAR | 1.25% | -0.38% | 116 | 100 | 216 |
| | t-stat | 1.21 | -0.80 | 53.70% | 46.30% | . |
| [+2,+20] | CAR | -0.07% | -0.05% | 108 | 108 | 216 |
| | t-stat | -0.10 | -0.10 | 50.00% | 50.00% | . |

| *Panel B: CDS Abnormal Changes (CASC)* | | | | | | |
|---|---|---|---|---|---|---|
| | | Mean | Median | Negative / % | Positive / % | Events |
| [-20,-2] | CASC | -0.47% | -1.53% | 124 | 92 | 216 |
| | t-stat | -0.47 | -2.05 | 57.41% | 42.59% | . |
| [+2,+20] | CASC | -1.98% | -1.32% | 118 | 98 | 216 |
| | t-stat | -1.61 | -1.45 | 54.63% | 45.37% | . |

**Table 4: Leverage Hypothesis: Credit Rating groups**

This table presents the mean and median cumulative abnormal CDS spread changes (*CASC*) for sub-group of events sorted according to the reference entity's credit rating, the corresponding t-statistics for the sample t-tests, the number and the percentage of negative and positive changes, the number of events, the difference between the highest and the lowest rating category's mean and median, and the corresponding p-values for the two-sample t-test and the Wilcoxon signed rank test, respectively. Panel A presents the results for the [-1,+1] day event window for the Investment Grade* (IG) group and the High-Yield** (HY) group of events. Panel B presents the results for the [-1,+1] day event window for 4 rating categories, i.e. AAA:AA-, A+:BBB-, BB+:B-, CCC+:D. Panel C and panel D present the results for the IG and HY groups for the [-20,-2] and the [+2,+20] day event windows, respectively.

*Investment Grade ratings belong to the range of AAA:BBB-.

** Investment Grade ratings belong to the range of BB+:D.

*Panel A: CDS Market Reaction for IG versus HY firms*

| Rating Category | CASC Mean | CASC Median | Negative | Positive | Events |
|---|---|---|---|---|---|
| **IG** | -1.80% | -0.69% | 87 | 69 | 156 |
| | -3.07 | -1.65 | 55.77% | 44.23% | |
| **HY** | -2.31% | -1.44% | 30 | 14 | 44 |
| | -2.56 | -1.90 | 68.18% | 31.82% | |
| **(HY) - (IG)** | -0.51% | -0.75% | | | |
| P-value | 0.42 | 0.26 | | | |

*Panel B: CDS Market Reaction for 4 Rating Categories*

| Rating Category | CASC Mean | CASC Median | Negative | Positive | Events |
|---|---|---|---|---|---|
| **AAA:AA-** | -6.12% | -0.53% | 5 | 4 | 9 |
| | -1.40 | -0.06 | 55.56% | 44.44% | . |
| **A+:BBB-** | -1.54% | -0.69% | 82 | 65 | 147 |
| | -2.73 | -1.65 | 55.78% | 44.22% | . |
| **BB+:B-** | -2.34% | -1.44% | 27 | 13 | 40 |
| | -2.38 | -1.89 | 67.50% | 32.50% | . |
| **CCC+:D** | -2.06% | -2.90% | 3 | 1 | 4 |
| | -1.26 | -1.38 | 75.00% | 25.00% | . |

| *Panel C: CDS Market Reaction for IG versus HY firms [-20,-2]* | | | | | |
|---|---|---|---|---|---|
| Rating Category | CASC Mean | CASC Median | Negative | Positive | Events |
| **IG** | -0.67% | -2.90% | 94 | 62 | 156 |
| | -0.35 | -2.67 | 60.26% | 39.74% | |
| **HY** | 0.02% | -0.37% | 23 | 21 | 44 |
| | 0.01 | -0.23 | 52.27% | 47.73% | |
| **(HY) - (IG)** | 0.69% | 2.52% | | | |
| P-value | 0.85 | 0.29 | | | |

| *Panel D: CDS Market Reaction for IG versus HY firms [+2,+20]* | | | | | |
|---|---|---|---|---|---|
| Rating Category | CASC Mean | CASC Median | Negative | Positive | Events |
| **IG** | -1.80% | -0.74% | 81 | 75 | 156 |
| | -1.11 | -0.53 | 51.92% | 48.08% | |
| **HY** | -0.93% | -1.21% | 25 | 19 | 44 |
| | -0.61 | -0.90 | 56.82% | 43.18% | |
| **(HY) - (IG)** | 0.87% | -0.47% | | | |
| P-value | 0.78 | 0.95 | | | |

**Table 5: Leverage hypothesis: Leverage, Relative Leverage, and Leverage change groups**

This table presents the mean and median cumulative abnormal CDS spread changes (CASC) for sub-group of events formed according to alternative firm-event characteristics, the corresponding t-statistics for the sample t-tests, the number and the percentage of negative and positive changes, the number of events, the difference between the highest and the lowest rating category's mean and median, and the corresponding p-values for the two-sample t-test and the Wilcoxon signed rank test, respectively. The first five columns contain the results for sub-groups of events formed according to the book leverage, defined as the long-term debt divided by the total assets. The second five columns contain the results for sub-groups of events formed according to the relative leverage, defined as the distance of the firm's leverage from its optimal leverage target estimated by the Flannery and Rangan **(2006)** model. The last five columns contain the results for sub-groups of events formed according to the proceeds amount divided by the long-term debt. Panels A, B, and C present the results for the [-1,+1], [-20,-2], and [+2,+20] day event window, respectively.

*Panel A: Announcement Time Window [-1,+1]*

| | Book Leverage | | | | | Relative Leverage | | | | | Proceeds / Long-term Debt | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tercile | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events |
| **1** | -1.82% | -0.53% | 40 | 32 | 72 | 1.58% | 0.50% | 22 | 24 | 46 | -1.57% | -0.55% | 41 | 33 | 74 |
| | -1.84 | -0.77 | 56.3% | 45.1% | . | 0.74 | 0.64 | 47.8% | 52.2% | . | -1.75 | -0.88 | 59.4% | 47.8% | . |
| **2** | -1.15% | -0.89% | 42 | 28 | 70 | -2.30% | -1.45% | 28 | 15 | 43 | -1.43% | -0.80% | 41 | 30 | 71 |
| | -1.72 | -1.62 | 59.2% | 39.4% | . | -1.98 | -1.91 | 66.7% | 35.7% | . | -0.93 | -1.47 | 56.2% | 41.1% | . |
| **3** | -1.65% | -1.22% | 45 | 29 | 74 | -4.53% | -1.89% | 29 | 12 | 41 | -1.57% | -1.17% | 43 | 26 | 69 |
| | -1.11 | -1.82 | 60.8% | 39.2% | . | -3.41 | -1.72 | 69.0% | 28.6% | . | -1.97 | -2.12 | 58.9% | 35.6% | . |
| **(3) - (1)** | 0.17% | -0.69% | | | | -6.11% | -2.39% | | | | 0.00% | -0.62% | | | |
| P-value | 0.92 | 0.30 | | | | 0.02 | 0.02 | | | | 1.00 | 0.49 | | | |

*Panel B: Anticipation Time Window [-20,-2]*

| | Book Leverage | | | | | Relative Leverage | | | | | Proceeds / Long-term Debt | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tercile | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events |
| **1** | -3.48% | -3.39% | 46 | 26 | 72 | 4.98% | -1.47% | 26 | 20 | 46 | -1.76% | -4.43% | 47 | 27 | 74 |
| | -1.38 | -2.24 | 63.9% | 36.1% | . | 1.01 | -0.71 | 56.5% | 43.5% | . | -0.55 | -3.19 | 63.5% | 36.5% | . |
| **2** | 1.22% | -0.09% | 36 | 34 | 70 | 1.40% | -0.74% | 22 | 21 | 43 | 1.22% | 0.45% | 35 | 36 | 71 |
| | 0.70 | -0.04 | 51.4% | 48.6% | . | 0.46 | -0.25 | 51.2% | 48.8% | . | 0.46 | 0.18 | 49.3% | 50.7% | . |
| **3** | 0.91% | -1.34% | 42 | 32 | 74 | -4.10% | -1.50% | 23 | 18 | 41 | -1.10% | -1.53% | 42 | 27 | 69 |
| | 0.29 | -0.68 | 56.8% | 43.2% | . | -1.41 | -0.59 | 56.1% | 43.9% | . | -0.75 | -1.34 | 60.9% | 39.1% | . |
| **(3) - (1)** | 4.39% | 2.06% | | | | -9.08% | -0.03% | | | | 0.66% | 2.89% | | | |
| P-value | 0.35 | 0.28 | | | | 0.13 | 0.57 | | | | 0.86 | 0.41 | | | |

*Panel C: Post-announcement Time Window [+2,+20]*

| | Book Leverage | | | | | Relative Leverage | | | | | Proceeds / Long-term Debt | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tercile | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events |
| **1** | -4.63% | -2.95% | 40 | 32 | 72 | -7.47% | -0.61% | 25 | 21 | 46 | -0.89% | -0.55% | 40 | 34 | 74 |
| | -1.83 | -1.56 | 55.6% | 44.4% | . | -2.05 | -0.22 | 54.3% | 45.7% | . | -0.34 | -0.39 | 54.1% | 45.9% | . |
| **2** | 0.41% | -1.48% | 41 | 29 | 70 | -2.68% | -3.20% | 28 | 15 | 43 | -3.28% | -1.54% | 40 | 31 | 71 |
| | 0.27 | -0.97 | 58.6% | 41.4% | . | -1.10 | -1.53 | 65.1% | 34.9% | . | -1.68 | -0.78 | 56.3% | 43.7% | . |
| **3** | -1.67% | -0.19% | 37 | 37 | 74 | -2.27% | -2.56% | 27 | 14 | 41 | -2.04% | -1.72% | 37 | 32 | 69 |
| | -0.77 | -0.13 | 50.0% | 50.0% | . | -3.44 | -1.72 | 65.9% | 34.1% | . | -1.19 | -0.94 | 53.6% | 46.4% | . |
| **(3) - (1)** | 2.96% | 2.76% | | | | 5.20% | -1.95% | | | | -1.15% | -1.17% | | | |
| P-value | 0.37 | 0.38 | | | | 0.26 | 0.95 | | | | 0.92 | 0.49 | | | |

**Table 6: Information Signalling and Wealth Transfer hypotheses**

This table presents the mean and median cumulative abnormal CDS spread changes (CASC) for sub-group of events formed according to alternative firm-event characteristics, the corresponding t-statistics for the sample t-tests, the number and the percentage of negative and positive changes, the number of events, the difference between the highest and the lowest rating category's mean and median, and the corresponding p-values for the two-sample t-test and the Wilcoxon signed rank test, respectively. The first five columns contain the results for sub-groups of events formed according to forecast dispersion, defined as the standard deviation of the equity analysts' 1-year forward EPS estimates. The second five columns contain the results for sub-groups of events formed according to the change in the analysts' 1-year forward EPS median estimate. The last five columns contain the results for sub-groups of events formed according to the market-to-book ratio. Panels A, B, and C present the results for the [-1,+1], [-20,-2], and [+2,+20] day event window, respectively. Panel D presents the results for the wealth transfer hypothesis. The first five columns contain *CAR* results for positive and negative CDS market reaction group of events. The next five columns contain *CASC* results for positive and negative stock market reaction group of events.

*Panel A: Announcement Time Window [-1,+1]*

| | Forecast Dispersion | | | | | Δ(EPS Median Forecast) | | | | | Market-to-Book | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tercile | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events |
| **1** | -0.20% | 0.22% | 28 | 32 | 60 | -1.17% | -0.53% | 36 | 32 | 68 | -0.78% | -0.73% | 37 | 28 | 65 |
| | -0.35 | 0.37 | 46.7% | 53.3% | | -1.28 | -0.69 | 52.9% | 47.1% | | -0.46 | -0.77 | 56.9% | 43.1% | |
| **2** | -1.63% | -0.58% | 34 | 26 | 60 | -0.98% | -0.73% | 37 | 27 | 64 | -2.14% | -0.80% | 33 | 29 | 62 |
| | -1.99 | -1.25 | 56.7% | 43.3% | | -1.87 | -1.50 | 57.8% | 42.2% | | -2.72 | -1.11 | 53.2% | 46.8% | |
| **3** | -3.83% | -1.76% | 43 | 22 | 65 | -3.79% | -1.72% | 41 | 23 | 64 | -1.87% | -1.19% | 39 | 23 | 62 |
| | -3.28 | -1.57 | 66.2% | 33.8% | | -3.57 | -1.39 | 64.1% | 35.9% | | -2.36 | -2.21 | 62.9% | 37.1% | |
| **(3) - (1)** | -3.63% | -1.98% | | | | -2.63% | -1.19% | | | | -1.08% | -0.47% | | | |
| P-value | 0.01 | 0.01 | | | | 0.06 | 0.02 | | | | 0.57 | 0.72 | | | |

| *Panel B: Anticipation Time Window [-20,-2]* | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Forecast Dispersion | | | | | Δ(EPS Median Forecast) | | | | | Market-to-Book | | | | |
| Tercile | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events |
| **1** | -0.42% | -3.05% | 38 | 22 | 60 | 1.35% | 0.45% | 34 | 34 | 68 | 1.79% | -2.90% | 36 | 29 | 65 |
| | -0.20 | -2.01 | 63.3% | 36.7% | | 0.37 | 0.22 | 50.0% | 50.0% | | 0.48 | -1.06 | 55.4% | 44.6% | |
| **2** | 2.42% | -0.62% | 32 | 28 | 60 | 0.80% | -1.06% | 37 | 27 | 64 | -0.73% | -1.50% | 36 | 26 | 62 |
| | 0.64 | -0.32 | 53.3% | 46.7% | | 0.39 | -0.92 | 57.8% | 42.2% | | -0.38 | -1.04 | 58.1% | 41.9% | |
| **3** | -4.12% | -2.79% | 40 | 25 | 65 | -4.62% | -4.77% | 44 | 20 | 64 | 0.98% | -0.66% | 36 | 26 | 62 |
| | -1.75 | -1.20 | 61.5% | 38.5% | | -2.51 | -3.29 | 68.8% | 31.3% | | 0.50 | -0.43 | 58.1% | 41.9% | |
| **(3) - (1)** | -3.70% | 0.25% | | | | -5.98% | -5.22% | | | | -0.82% | 2.24% | | | |
| P-value | 0.24 | 0.48 | | | | 0.15 | 0.17 | | | | 0.85 | 0.69 | | | |

| *Panel C: Post-announcement Time Window [+2,+20]* | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Forecast Dispersion | | | | | Δ(EPS Median Forecast) | | | | | Market-to-Book | | | | |
| Tercile | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events | CASC Mean | CASC Median | Neg | Pos | Events |
| **1** | -0.42% | -0.55% | 34 | 26 | 60 | -3.27% | 0.11% | 33 | 35 | 68 | -6.90% | -2.82% | 45 | 20 | 65 |
| | -0.23 | -0.40 | 56.7% | 43.3% | | -1.10 | 0.06 | 48.5% | 51.5% | | -2.90 | -2.33 | 69.2% | 30.8% | |
| **2** | -3.24% | -1.60% | 33 | 27 | 60 | -0.38% | -0.74% | 35 | 29 | 64 | -0.82% | -1.32% | 35 | 27 | 62 |
| | -1.29 | -0.81 | 55.0% | 45.0% | | -0.26 | -0.42 | 54.7% | 45.3% | | -0.43 | -0.56 | 56.5% | 43.5% | |
| **3** | -2.06% | 0.86% | 31 | 34 | 65 | -1.19% | -1.21% | 35 | 29 | 64 | 0.93% | 0.70% | 29 | 33 | 62 |
| | -0.74 | 0.36 | 47.7% | 52.3% | | -0.57 | -0.66 | 54.7% | 45.3% | | 0.55 | 0.39 | 46.8% | 53.2% | |
| **(3) - (1)** | -1.64% | 1.41% | | | | 2.08% | -1.32% | | | | 7.83% | 3.52% | | | |
| P-value | 0.63 | 0.98 | | | | 0.57 | 0.82 | | | | 0.01 | 0.00 | | | |

*Panel D: Wealth Transfer Hypothesis*

| Tercile | CAR Mean | CAR Median | Neg | Pos | Events | | CASC Mean | CASC Median | Neg | Pos | Events |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CASC > 0** | -3.39% | -1.74% | 66 | 24 | 90 | **CAR > 0** | -2.80% | -1.41% | 42 | 24 | 66 |
| | -5.19 | -3.92 | 73.3% | 26.7% | | | -2.84 | -3.05 | 63.6% | 36.4% | |
| **CASC < 0** | -2.12% | -2.04% | 85 | 41 | 126 | **CAR < 0** | -0.99% | -0.58% | 85 | 66 | 151 |
| | -3.44 | -3.99 | 67.5% | 32.5% | | | -1.22 | -1.35 | 56.3% | 43.7% | |

**Table 7: Multivariate Analysis: Quantile Regressions**

This table presents cross-sectional quantile regressions of the following form:

$$CASC_i = a + b_1 \times proxy + \sum_{k=2}^{n} b_k \times Control\_Variable_{k-1} + e_i$$

Where *CASC* is the cumulative abnormal CDS spread change (*CASC*) of the [-1,+1] day event window, *proxy* represents the alternative proxies used in the univariate analysis of the previous tables. The proxies are Book Leverage (Column 1), Relative Leverage (Column 2), Proceeds/LT-Debt (Column 3), Forecast Dispersion (Column 4), Δ(EPS Forecast) (Column 5), Market-to-Book ratio (Column 6), and the cumulative stock return for the corresponding time window, *CAR* [-1,+1], (Column 7). The additional control variables involve the logarithm of market capitalization, the CDS spread, and the number of contributors of the daily CDS market quotes. T-statistics are reported in parenthesis above the coefficients. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

| | Leverage Hypothesis | | | Information Signaling | | | Wealth Transfer |
|---|---|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Book Leverage | -0.011 | | | | | | |
| | (-0.460) | | | | | | |
| Relative Leverage | | -0.218** | | | | | |
| | | (-2.377) | | | | | |
| Proceeds / LT-Debt | | | -0.003 | | | | |
| | | | (-0.368) | | | | |
| Forecast Dispersion | | | | -0.028* | | | |
| | | | | (-1.807) | | | |
| Δ(EPS Forecast) | | | | | 0.005 | | |
| | | | | | (1.441) | | |
| Market-to-Book | | | | | | 0.000 | |
| | | | | | | (0.755) | |
| CAR [-1,+1] | | | | | | | -0.198** |
| | | | | | | | (-2.066) |
| Log(Market Value) | -0.002 | 0.000 | 0.001 | -0.003 | -0.004 | -0.002 | 0.001 |
| | (-0.434) | (0.026) | (0.181) | (-0.869) | (-1.045) | (-0.392) | (0.105) |
| CDS Spread | -0.569 | 0.072 | -0.552 | -0.761*** | -0.787*** | -0.683 | -0.486 |
| | (-1.181) | (0.094) | (-1.156) | (-2.684) | (-3.031) | (-1.406) | (-1.108) |
| No of Contributors | -0.000 | 0.000 | -0.000 | -0.000 | -0.001 | -0.001 | -0.001 |
| | (-0.036) | (0.036) | (-0.473) | (-0.355) | (-0.725) | (-1.131) | (-1.054) |
| Constant | 0.022 | -0.015 | -0.003 | 0.039 | 0.042 | 0.025 | -0.001 |
| | (0.602) | (-0.151) | (-0.066) | (1.226) | (1.383) | (0.624) | (-0.015) |
| No of Observations | 215 | 130 | 215 | 185 | 196 | 188 | 216 |
| R-squared | 3.70% | 15.20% | 3.00% | 7.20% | 6.50% | 4.00% | 0.10% |

**Table 8: Appendix: Partial adjustment model estimation results**

This table presents the estimation results of the partial adjustment model of Flannery and Rangan **(2006)**:

$$MDR_{i,t+1} = (\lambda\beta)X_{i,t} + (1-\lambda)MDR_{i,t} + \varepsilon_{i,t+1}$$

Where *MDR* is the leverage ratio, *X* is the set of explanatory variables which includes: *EBIT_TA*: is the earnings before interest and taxes divided by total assets, *MB* is the Market-to-book ratio, *LnTA* is the logarithm of total assets, *FA_TA* is the ratio of fixed assets to total assets, *R&D_Dum* is a dummy variable that equals one when the firm does not report R&D expenses, *R&D_TA* is the R&D expense divided by total assets, and *Ind_Median* is the median MDR of the sector the firm belongs to. We use the Standard Industry Classification (SIC) 2-digit codes to classify firms into industries. Columns (1), (2), and (3) present the estimation results for Ordinary Least Squares (OLS), Least Squares Dummy Variable (LSDV), and Blundell and Bond's GMM estimation, respectively. T-statistics are reported in parenthesis above the coefficients. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

| | (1) | (2) | (3) |
|---|---|---|---|
| VARIABLES | OLS | LSDV | BB (GMM) |
| *MDR* | 0.846*** | 0.600*** | 0.726*** |
| | (350.122) | (120.651) | (100.249) |
| *EBIT_TA* | -0.023*** | -0.048*** | -0.037*** |
| | (-9.234) | (-11.356) | (-4.916) |
| *MB* | -0.002*** | -0.001*** | -0.003*** |
| | (-12.807) | (-2.742) | (-6.002) |
| *DEP_TA* | -0.163*** | -0.171*** | -0.446*** |
| | (-11.329) | (-6.543) | (-10.377) |
| *LnTA* | 0.003*** | 0.024*** | 0.014*** |
| | (17.287) | (25.378) | (11.121) |
| *FA_TA* | 0.013*** | 0.035*** | 0.021** |
| | (7.403) | (5.263) | (2.401) |
| *R&D_Dum* | -0.006*** | 0.003 | -0.023*** |
| | (-6.486) | (1.264) | (-4.920) |
| *R&D_TA* | -0.059*** | -0.016* | -0.047*** |
| | (-11.599) | (-1.763) | (-3.140) |
| *Ind_Median* | 0.065*** | 0.051*** | 0.060*** |
| | (21.170) | (6.375) | (6.391) |
| *Constant* | 0.062*** | -0.018*** | -0.009 |
| | (23.550) | (-2.990) | (-0.966) |
| Firm fixed effects | NO | YES | YES |
| Year dummies | YES | YES | YES |
| R-square | 0.804 | 0.444 | - |
| No_of_Obs | 95,229 | 95,229 | 95,229 |