**Capital Structure Adjustment and Market Reaction following**

 **Seasoned Equity Offerings**

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**Abstract**

This paper analyzes the market reaction towards capital structure adjustment through seasoned equity offerings in the US. It recognizes that capital structure and equity mispricing are closely associated with seasoned equity offering. We specifically propose that if the tradeoff theory holds and firms follow target capital structures, then, firms that are overlevered would effectively exploit an overvalued equity in a cost effective adjustment of their capital structures through seasoned equity offerings. We also test how the market then reacts to such capital structure adjustment attempts. Controlling for other motives of seasoned equity offerings in a sample of 1,725 secondary issues by 1,016 US non-financial firms from 2004 to 2013, we found that firms that were ex-ante overlevered and overvalued were more likely to announce a seasoned equity offering. As regards the market reaction to such capital structure adjustments, it is found that the market favorably reacted in both the short term as well as long term, as evidenced by positive 3-day CARs and BHARs, respectively. Moreover, post event evidence suggests that on the average overlevered firms reduced their deviations from the target and that their leverage levels mainly stayed around the targets till at least 3 years after the secondary equity issues.

JEL classification: G12, G14, G30, G32,

**Keywords:** optimal capital structure, equity mispricing, market timing, seasoned equity offering, residual income valuation model.

1. **Introduction**

The seasoned equity offering (SEOs) is an important source of financing as well as a measure to alter the capital structure of a firm (DeAngelo, DeAngelo, & Stulz, 2010; Eckbo, Masulis, & Norli, 2007; Masulis & Korwar, 1986). Another important reason which stimulates firms to announce SEO’s is getting economic gains from overvaluation by considering the market timing (Bayless & Chaplinsky, 1996; Graham & Harvey, 2001). If managers want to maximize the wealth of the existing shareholders, they offer securities to them only when they believe that it is undervalued (Jenter, Lewellen, & Warner, 2011; Myers & Majluf, 1984). However, most of the literature supports that the capital market reacts negatively, approximately -1% to -3% on average, towards SEO announcements (Asquith & Mullins, 1986; Bradley & Yuan, 2013; Huang & Ritter, 2009; Intintoli, Jategaonkar, & Kahle, 2014; Jindra, 2000; Korajczyk, Lucas, & McDonald, 1991; Masulis & Korwar, 1986; Purnanandam & Swaminathan, 2006). In the short-run, there is subsequent decline in operating performance of firms. However, these stocks perform well in long run (Chemmanur, He, & Hu, 2009). Issuing new stocks also adjusts a firm's capital structure as issuing shares increases equity, which consequently, decreases a firm's debt to equity ratio.

There is no universal consensus on the proper level of debt to equity ratio a firm should maintain. However, there are some conditional theories including trade-off theory, pecking order theory, and market timing theory that try to explain the variation in corporate debt ratios. The trade-off theory explains the choice between the equity finance and debt finance to be determined by balancing the cost and benefits of debt financing. According to the pecking order theory, firms prefer debt over equity financing due to lower costs incurred in raising debt finance compared to equity finance. Market timing theory holds the view that the decision to issue equity depends on market performance(Sheikh & Wang, 2011). The trade-off model predicts that each firm adjusts gradually toward their target leverage level (Flannery & Rangan, 2006; Shyam-Sunder & C Myers, 1999) . However, the equity based system adjusts more rapidly towards an optimal level than debt dominated system (Lööf, 2004).

In this paper, we test these theories in an integrated framework within the perspective of a firm having a target capital structure. Specifically, we are interested in whether such firms, if overlevered, issue a secondary equity to rebalance their capital structure and then to find how the market reacts to such announcements. We also test for another particular implication of the trade-off theory i.e. the connection of the capital structure to growth opportunities. Myers (1977) predicts that since being overlevered increases the cost of further debt for a firm, being overlevered is therefore more costly for a growth firm. This is because for a growth firm the risk of underinvestment increases as the leverage increases levels and cost of debt financing exceed the target level. This suggests that firms with higher growth opportunities may be particularly expected to avoid a positive deviation from the target leverage (i.e. being overlevered).

This study sheds further light on the importance of target capital structures. It measures the effect of capital structure on market reactions during the issuance of SEOs, by studying the association between capital structure policy, SEOs and both the short term and long term stock returns. Previous studies have attempted to find the SEOs’ relationship with leverage and valuation separately (e.g. (DeAngelo et al., 2010; Loughran & Ritter, 1997; Masulis & Korwar, 1986). However, to the best of our knowledge, the combined relationship between leverage and valuation with respect to the SEOs has not been yet established. Our motive here is therefore to find out whether or not firms can obtain economic gains by considering the valuation and leverage as significant joint factors in SEO decision. Specifically, in this paper, our main objectives are: First, to analyze whether leverage and valuation are significant determinants of an SEO decision. Second, to study the impact of valuation and leverage on market reaction when seasoned equity is announced. Third, to investigate whether leverage and valuation are significant sources of economic gain when a firm is overvalued, in conjunction with the firm’s decision to announce SEOs. Finally, in relation to claims that firms’ decision to issue seasoned equity is driven by a capital structure adjustment, we examine whether the capital structure of these firms remain stable for a certain number of years after the event.

Our sample comprises of U.S firms that announced seasoned equity during the period of 2004 to 2013. Compared to the time series partial adjustment model which has the problem of mean reversion but used by most of the earlier studies, we use a more rigorous measure for leverage target using the Tobit regression approach of (Harford, Klasa, & Walcott, 2009; Kayhan & Titman, 2007; Uysal, 2011). In line with these studies, we use annual cross sectional Tobit regressions of actual book and market leverage measures on the determinants of capital structure. We then estimate the predicted values of book and market leverage from these regressions to obtain target leverage ratios. In addition to this, for the valuation measures, we use two approaches; the Rhodes Kropf and Viswanathan Valuation (RKRV) (Rhodes–Kropf, Robinson, & Viswanathan, 2005) model which is based on market to book decomposition, and the Residual Income Valuation Model (RIVM) (Ohlson, 1991, 1995) as used for stock repurchase market reaction by Bonaimé, Öztekin, and Warr (2014) .

We conduct the tests with respect to our objectives in a number of ways while controlling for other possible important factors related to the SEOs. In particular, we test for whether the SEO announcements by our sample firms are driven by a short-term exploitation of overvalued equity in order to fulfill a cash shortage. We also verify whether the existence of growth opportunities has a (joint) impact on the market reaction to SEO announcements along with valuation and leverage.[[1]](#footnote-1)

Our empirical analysis provides evidence that the firms will more likely issue seasoned equity when their overlevered and overvalued. Moreover, these firms get more favorable market reaction (less value destroying) both in the long run as well as in the short run. We also find that when seen in isolation, cash and growth opportunities are other important determinants of an SEO decision however, in combination with leverage and equity valuation these factors fail to qualify as determinants or return generating motives of SEOs. The remainder of the paper is organized as follows: the next section consists of theoretical framework and literature review about seasoned equity offerings, its effect on stock prices and its connections with growth opportunities, leverage and capital structure. Section 3 presents sample selection, data collection, variables construction, and model specifications. Analysis and discussion of findings are presented in section 4 followed by robustness checks in section 5. Finally, Section 6 concludes the paper and presents some recommendations based on our findings.

1. **Literature Review**

Among corporate events, announcements related to debt and equity issues (both IPOs as well as seasoned equity offerings SEO) have gained particular interest of researchers. This is because debt and equity issues adjust a firm's capital structure.

Capital structure and firm valuation are important aspects to be considered in determining the optimal level of leverage. If a firm follows through trade-off theory, then it should have a target debt to equity ratio in order to achieve an optimal capital structure. Deviations from target capital structure often occur due to information asymmetry, financing growth opportunities and contracting costs. Firms may not quickly adjust back to such targets as cost has to be incurred to achieve this adjustment. If this adjustment cost is zero, the firm will be on its optimal level of leverage. Adjustment towards target debt to equity ratio is to be partial rather than full adjustment process which happens on gradual basis (Myers, 2001). In this paper, it is assumed that firms issuing securities seek to adjust leverage toward a target ratio. However, we are not discussing how these firm determine their capital structure as it is beyond the scope of this paper.

Another important aspect often considered in capital structure related decisions is market timing. The market timing theory of capital structure predicts that equity issuance depends upon market performance (Korajczyk et al., 1991). As far as market timing is concerned, overvalued firms are more likely to issue equity while, undervalued firms will not, and rather wait till misvaluation cost becomes small enough to get maximum benefits. The market price of a share is essential for the decision of equity issuance. These decisions affect the equity value which can deviate from its fair value and this deviation entails a cost. In our study, we consider that market-timing affects the cost of adjusting to a target leverage ratio.

Firms issue equity for a variety of reasons: to alter the level of financial leverage, to satisfy increasing financial needs, and to invest in growth (DeAngelo et al., 2010; Eckbo et al., 2007; Masulis & Korwar, 1986) and also to get economic gains from overvaluation by considering the market timing (Bayless & Chaplinsky, 1996; Graham & Harvey, 2001; Jindra, 2000; Loughran & Ritter, 1997). Jindra (2000) finds that most firms issue seasoned equity at a time when they are overvalued and they tend to issue when this overvaluation is at its peak. Moreover, he described that overvaluation of firm is an important factor for the decision of SEO.

The issuing of debt or equity causes a change in the capital structure of a firm that is mainly due to market imperfection. Subsequent to the issuance of equity, two different phenomenon prevail: when the firm is overlevered and overvalued, it mainly generates negative returns. This is because when firms issue SEOs at discounted price, most of the equity produce negative returns because it increases supply of equity in the market. This is recorded in the seminal studies like; Bradley and Yuan (2013); Cox and Aryal (2007); Korajczyk et al. (1991); Purnanandam and Swaminathan (2006); Quynh-Nhu (2009). The issuing of unexpected equities signals that firm has shortfall in operational cash flow that causes a decline in its market value (Fama & French, 2006; Intintoli & Kahle, 2010; Slovin, Sushka, & Lai, 2000). On the other hand, when the firm is underlevered and overvalued it mainly generates medium return (destroy less value of equity). Previous literature further reports a significant but lower or negative return for overvalued firms and positive returns for undervalued firms. Overvalued firms can more rapidly adjust their target leverage at low cost of adjustment whereas undervalued firms slowly adjust to their target capital structures at a higher cost of adjustment (Warr, Elliott, Koëter-Kant, & Öztekin, 2012) . This behavior is consistent with trade-off theory of return predictions.

In this study, we aim to evaluate the intentions of secondary share issuing and how firms’ stock prices react in the stock market to the capital structure adjustments achieved through it. In particular we try to find whether the motives of SEOs is solely a capital structure adjustment or other factors like cash and growth opportunities also play a role in combination. A number of studies find association between leverage and equity misevaluation, either individually or jointly, relative to share repurchases (Bonaimé et al., 2014; D'mello & Shroff, 2000; Grullon & Michaely, 2002; Massa, Rehman, & Vermaelen, 2007; Warr et al., 2012). Moreover, in previous literature, we find association of seasoned equity offering with leverage and misvaluation separately (DeAngelo et al., 2010; Loughran & Ritter, 1997; Masulis & Korwar, 1986). We extend this literature and examine the simultaneous effect of leverage, misevaluation cash holding and growth options on the likelihood of seasoned equity offering as well as on the short term and long term abnormal returns.

Firms, when overvalued, may also issue equity for cash or short-term exploitation and as a cheaper source of financing for growth firms. We therefore, repeat our models including these two factors in combination with leverage and valuation. This study is different from other previous studies on the subject in a number of ways. First, we use more precise measure of leverage and valuation. We use two approaches to measure the equity mispricing: the Rhodes Kropf and Viswanathan Valuation (RKRV) Model(Rhodes–Kropf et al., 2005) and Residual Income Valuation Model (RIVM) (Ohlson, 1991, 1995). Previously, other researchers used market-to-book valuation methods. For example, see, McConnell and Servaes (1995); Stulz (1990). Second, we use a two-step process to identify whether a firm is over-levered or under-levered. In the first step, we run cross sectional annual Tobit regressions of the determinants of leverage and then calculate the target leverage as residuals from these regressions. In the second step we calculate deviations of actual firm leverage levels from these targets. We then divide the whole deviation data into terciles such that the upper tercile is coded as being overlevered while the lower tercile firms as underlevered. It is expected that leverage and valuation are significant sources of getting more favorable market returns by destroying less value.

* 1. **SEOs announcement testable return predictions**

Previous studies documented that seasoned equity produce negative returns and underperform in the long-run. Therefore, we condition firms on the basis of being (overlevered or underlevered and overvalued or undervalued). Thus a firm that has sought to change its capital structure through SEO in our sample can be assigned to any one of the following four groups (overlevered & overvalued, underlevered & overvalued, overlevered & undervalued, and underlevered & undervalued). If this shift occurs from underlevered or undervalued group to overlevered or overvalued group, we predict this shift will cause less value destruction in the case of seasoned equity offering. Table 1 graphically presents the main hypotheses of our study.

**Insert table 1 here**

The hypothesis stating that overvalued firms with overvalued equity obtain medium returns following SEO announcements is supported by Intintoli et al. (2014); Masulis and Korwar (1986); Purnanandam and Swaminathan (2006). If firms lie ina quadrant where they can generate negative announcement returns, i.e., underlevered firms with undervalued equities, they obtain negative announcement returns. Stock returns lie in these two extremes according to trade-off and market timing theories. The medium announcement returns quadrant is an optimal scenario in SEOs case. If target leverage and equity valuation are significant reasons of gain in case of seasoned equity offering, then it will be similar to our expectation that firms should consider these two aspects before the announcement of SEOs.

1. **Data collection and Methodology**

In this study, three main data sources are used: event announcement dates were retrieved from Thomson One Banker, stock returns data was taken from Center for Research in Security Prices (CRSP) and Data stream was used to gather all accounting data.

* 1. **Sample Construction**

Our sample consists of firms listed in New York stock exchange and NASDAQ which announced secondary equity offerings during the period 2004-2013. We classify the sample firms in industries on the basis of Standard Industry Codes (SIC) of Fama & French (Fama & French, 1997). This classification consists of 12 industries. We excluded firms from the financials (SIC: 6000-6999) and utilities (SIC: 4900-4999) industries because of regulatory influences on their capital structure choice. Event data (announcement date of each security) is extracted from Thomson One Banker and accounting data for that particular sample is extracted from Data stream. The initial sample consisted of 1,641 US firms that made seasoned equity offerings over the sample period. We further filtered the sample by matching three important aspects: non-zero debt firms, event announcement date and related accounting data. After these adjustments, the sample size reduced to 1,260 US firms.

Moreover, in this study since our fundamental focus is on the stock market reaction to firms issuing SEOs, our event study model required a minimum of 100 days returns data for each security for the calculation of CARs and at least 1 month and maximum of 60 months of return data for the calculation of BHAR s. We also excluded zero or non-debt firms from the sample. After applying these criteria, the final sample size reduced to 1,016 US firms listed in National Association of Securities Dealers Automated Quotations (NASDAQ) and New York Stock Exchange (NYSE). This accounted for a total of 1,725 SEO events for the estimations of CARs and 1,279 events for the calculations of the BHARs.

**Insert figure 1 here**

Figure 1 presents the numbers of announcements of SEO’s held in each financial year. It is observed that SEO announcements rapidly increase in the period when the economy is in recession and decreases when the economy is in boom (before and after 2008 global financial crisis). This finding is consistent with previous studies; see for example, Bonaimé et al. (2014).

### **Measuring distance between observed and target leverage**

For identification of the over and under levered firms, we adopt a three-step procedure following previous studies (e.g. Fama and French (2002)). First of all we follow the procedure of Kayhan and Titman (2007) and estimate the target capital structure by running yearly cross sectional Tobit regressions of leverage (both market as well as book leverage proxies) on the determinants of capital structure (Equation 1). The ﬁtted values from this regression  are defined as the target leverage ratios.

 (1)

Where,

 is a matrix of firm’s characteristics as determinants of optimal capital structure based on capital structure literature (e.g., Kayhan and Titman (2007); Rajan and Zingales (1995); Titman and Wessels (1988). These determinants or firm characteristics include: earnings before interest and taxes, market to book ratio, fixed assets, tangibility, depreciation, R&D expenses, size scaled to total assets, and median industry leverage ratio. Industry categorization is done as in (Fama & French, 1997) . Moreover, is proxied alternatively by Book Leverage (BL) and Market Leverage (ML) measured as:

 (2)

 (3)

At the second step, we define  i.e., the actual leverage ratio minus the target leverage ratio estimated from the first step as a leverage deviation variable. Results of equation (1) are summarized in (Appendix-A) while market as well as book leverage deviations are summarized on annual basis in last two columns of Table 2.

Finally, as the third step we classify firms as over or under levered. For this purpose each year we divide the whole sample into terciles based on the firms’ deviations from the target. We then classify a firm as overlevered if lies in the upper tercile and underlevered if it belongs to the lower tercile while those that are in the middle are treated as firms that have no or very little deviations from the target.

### **Estimating Equity Misvaluation**

Market-to-book ratio is often used in academic research as a measure of firm’s valuation. However, some studies argued that this approach is poor proxy for measuring valuation since it includes factors such as debt overhang and growth options (Baker & Wurgler, 2002; Warr et al., 2012) . The relationship between other variables in the model and market-to-book ratio is observed to be inconsistent. To overcome this problem, we use two, more precise, measures to estimate the value of equity: the Rhodes Kropf and Viswanathan Valuation (RKRV) (Rhodes–Kropf, Robinson, & Viswanathan, 2005) decomposition of Market-to-Book Method and Residual Income Valuation Model (RIVM). Misvaluation occurs when there is distance between fair value and market price, which arises due to information asymmetry between insiders and the market. To estimate the level of misvaluation, we use the RKRV model forwarded by Rhodes–Kropf et al. (2005) which empirically explores the mispricing, by decomposing market-to-book ratio into two components, i.e., the value component and growth component, presented as follows.

 (4)

Where

*M* = market value of equity

 = book value of equity

 = fundamental value

Eq. (4) defines the market to book ratio as equal to the product of market value to fundamental value and fundamental value to book value 

Taking logs of Eq. (4), we get:

 (5)

(Lowercase letter shows the log expressions)

They assume that if security is on its fundamental price then there will be no misvaluation. It means, if firms perfectly estimate their growth opportunities and future expected earnings, then is equal to zero and is equal to. If firms fail to estimate the future cash flow and growth opportunities this leads to firm misvaluation. If stock market price is not at its fair level then positive  represents firms’ level of overvaluation whereas negative result implies undervaluation. Log of market to book or  can be decomposed into three components: firm-specific, sector specific~~,~~ and long run. Eq. (6) displays this decomposition of the market-to-book ratio, is the linear function of firm-specific accounting multiples at time t, is vector of where  is conditional accounting information or accounting multiple. This expression is showing that predicted or value is a function of at time t.

 (6)

Where

 = (Firm-specific Error: difference between observed and fair value. It captures only firm-specific deviation from fair level)

 = (Sector-specific time-series Error: deviation between fair value and long-run value, it’s independent from time)

 = (Long-run component: Difference between long-run value and firm’s book value)

Where

 &  Represents the firm and year 

Represents the long-term multiple

 Accounting multiple at time 

By implementing the RKRV approach, we are using the first component i.e., the firm-specific error which captures the firm specific deviation from its fair level, where it breaks the deviation from the market value into three firm specific components i.e., the book value of firm, the RKRV leverage and *NI* net income.

Eq. (7) shows the model for this approach. We estimated this equation over each year of the study period and used the residuals as our estimates of the firm level misevaluation (i.e., the firm level value deviation from its fair level)

 (7)

Where

 is book value

 is interaction with dummy net income variable, and absolute value of net income

 is leverage (Eq. (8)

 is absolute value of net income

 is computed as:

 (8)

 (9)

In Eq. (9) the fair value of security is divided by security market price” *p”* at time zero.

Where is the Market price of equity at time zero.

On the other hand, our second measure of value uses the RIVM model that originated from accounting literature (Ohlson, 1991, 1995). This model is used to determine the firm value on the basis of its book worth and its earning. In this model, securities are valued at the firm’s book value (book value per share). If a firm earns more or less than its required rate of return due to management decisions, it is called abnormal earning which can be positive or negative. When firms repurchase shares, issue equity, and tender offer etc., these decisions may affect the required rate of return. RIVM is used to measure accumulation of discounted estimated earnings in excess of the required rate of return on book value per share basis.

Formal presentation of RIVM is given below:

 (10)

Where,

= at time 0 commencement of accounting year

 = Value of firm equity at 

= Book value at 

 = Extra-Ordinary Income at time t (by using Perfect Foresight Model)

 = Cost of equity estimated by Fama-French Three Factor Model

The terminal value is calculated using RIVM, for average of 2 years, which should be non-negative. When terminal value is negative, it means that the firm has continuously and perpetually invested in negative net present value projects. Estimated equity misvaluation at time zero is measured by using eq. (10)

 (11)

In Eq. (11) the fair value of security is divided by security market price at time zero.

### **Estimating the abnormal returns (or Measuring the short term and long term market reaction)**

We measure the market reaction to SEO announcements by our sample firms in the short term as well in the long run by estimating Cumulative Abnormal Returns (CARs) and Buy & Hold Abnormal Returns (BHAR) respectively. Below we detail our estimation for both these methods.

* + 1. **Estimating CARs**

To measure the effect of short term stock market reaction generated by our sample SEOs, we use 3 day CARs (%) following the approach introduced by Brown and Warner (1985). The event window in this study consists of three days i.e. from day -1 (a day before the event date), day 0 (the event date) and day +1 (a day after the event date). Our choice of the 3 days event window is based the arguments of Brown and Warner (1985) and the evidence from previous literature. According to Malkiel and Fama (1970), the basic assumption of event study is that the market is efficient. It means that the stock prices are instantaneously incorporating the news arising as a result of the issuance of SEOs and there must be no chance to earn abnormal profit by conducting a trading activity around the event date. If the market is not efficient, there can be a delay in incorporating the SEO news into stock prices, offering contemporaneous gains to traders (MacKinlay, 1997; Peterson, 1989). The use of longer window prevents the confounding effects of an event and reduces the power of an event’s statistical significance (McWilliams & Siegel, 1997);(Brown & Warner, 1985). However, a smaller event window usually captures appropriate effects of the event on the target phenomenon (Dann, Mayers, & Raab Jr, 1977; Mitchell & Netter, 1989; Ryngaert & Netter, 1990).

Moreover, for the estimation of expected returns, we use the market model over an estimation window of 255 trading days ending 46 days before the SEO announcement. The CRSP Value Weighted Index is used as our proxy for market portfolio returns. Further, we require a minimum of 100 days of returns to be available for each firm in the sample to estimate the market model.

* + 1. **Estimating the Buy & Hold Abnormal Returns (BHARs)**

If firms are issuing seasoned equity in order to rebalance their capital structures to their targets, the reaction must not be merely a short term one and rather must persist for a longer time, generating long term abnormal returns, we therefore estimate the Buy & Hold Abnormal Returns to check for this possibility.[[2]](#footnote-2)

Moreover, (Barber & Lyon, 1997; Kooli & Suret, 2004; Ritter, 1991) among others, argue that BHAR have an edge over the CARs in that it precisely measures the investors’ experience. In addition, the long term investor reaction is better tapped by a compounding of the short term returns to arrive at Buy and Hold returns. Thus as an alternative to CARs we first calculate the Buy and Hold Returns by a procedure that considers that the stock is purchased at the first closing price after the issue and is held till its Tth Anniversary. The Buy and Hold return RiT is then given as;

 (12)

Where T is the total number of months for which the abnormal returns are to be calculated and rit is the raw return on firm i in event month t. For T we required a minimum of 12 months and upto a maximum of 60 months of data for our estimations. The holding period return for the benchmark RmT during the corresponding period for firm i is also calculated in the same manner.

We follow Ritter (1991) and Kooli and Suret (2004) to calculate the Buy & Hold Abnormal Returns using market adjusted returns as follows;

 (13)

Where,  represents the return on the benchmark during the corresponding time. The mean BHAR for a time period t is then defined as;

 (14)

We estimate value weighted Buy & Hold Abnormal Returns (BHARs) with annual rebalancing such that the weight xit is where MVi is a firm’s Market value on the date of listing.

Table 2 presents a brief overview of the seasoned equity announcements done by US non-financial firms as stated in the Thomson One Banker database over a period from 2004 to 2013, the median 3-day CARs (%) and the median 60-months BHARs for each year. Deviation represents distance between observed and target leverage, measured using book leverage as well as market leverage with targets calculated from annual cross sectional tobit regressions of leverage determinants. VP (RIVM) is the value to stock price ratio measured by Residual Income Valuation Model and VP (RKRV) is the value to stock price ratio measured by Market-To-Book Decomposition Method of (RKRV).

**Insert table 2 here**

Table 2 shows that the annual 3-day median CARs range from -1.18% to -1.99% during the first four years (2004-2007). These results are derived from the small sample firms of those years. However, in the remaining years (2008-2013) the median CARs fall in much larger range (-3.70% to -7.21%) and the number of firms also increases. The year 2009 is showing the highest negative annual 3 days median CAR that can be due to the effect of 2008-09 US financial crisis. It is further observed from the CAR results that when the US economy is in boom the CAR obtains lower negative range and when the US economy is in recovery it produces higher negative CAR values. The results also enlighten that the numbers of SEO firms decrease during expansionary business period and increase during recessionary time. Moreover, regarding the long term abnormal returns (BHAR), we see that these are mostly positive, as opposed to short term abnormal returns (CARs). The median annual BHARs range from -0.22% in 2005 to 4.97% in 2008.

These figures show that on the average the market reacted negatively to the SEO announcements in the short run while positively over the long run. However, we will shed further light on these returns by considering the possible motives behind SEO announcements. In particular, we test for the market reaction to SEO announcements induced by motives such as capital structure adjustment, cash and short-term exploitation motive and growth opportunities in our next section (Analysis and Results).

1. **Analysis and Results**

We carry out our analysis in a number of ways through multivariate regressions. First, we test whether leverage deviations and equity misvaluation are possible determinants of the SEOs? Next, we test for the market reaction, both the short term price reaction (CARs) as well as long term reaction (BHARs), to SEOs made by firms grouped on the basis of having different leverage deviations from target (over vs. under levered) and different market valuation levels (over vs. undervalued). Finally, we run some robustness checks for other competing possible motives of SEO announcements and the market reactions thereto. We discuss these results in detail in the sections that follow.

* 1. **Capital Structure and Valuation as Determinants of the SEO Decision**

We start our analysis with answering the question of whether firms’ seasoned equity offering decisions are motivated by a cost effective adjustment of the capital structure. We estimate logit regressions of the decision to announce seasoned equity offering on leverage and valuation measures, controlling for other possible motives of the SEO decision. Our dependent variable is *SEO-Decision* dummy which is coded 1 for firms that announced a seasoned equity offering and zero otherwise. For the valuation and leverage factors we followed a classification procedure and created leverage and valuation indicator variables based on the classification. We divided the sample firms into terciles of the deviations of leverage and valuation as calculated in section 3.2 and 3.3 respectively. The middle leverage and value firms were coded as zero because these firms are on (close to) the optimal/target level. Firms belonging to the upper tercile were classified under the indicator *Overlevered* (*Overvalued*) while those in the lower tercile were classified under the indicator *Underlevered* (*Undervalued*). Control variables included firm size, cash and short-term investments scaled by total assets, non-operating cash flow, property plant & equipment, standard deviation of cash flow using 5 years cash flow data with at least a minimum of 3 years data of cash flow and sales growth. All variables are demeaned and all control variables are measured at the end of the prior fiscal year.

Results are shown in Table 3, where the odd-numbered models (i.e. Model 1, 3, 5 and 7) have leverage and valuation indicators included separately while even-numbered models (i.e. 2, 4, 6 & 8 ) are based on interactions of the leverage and valuation indicators to capture the combined effect of these factors on the SEO decision. Results of the individual impacts of leverage and valuation show that overvaluation is a strong motive for issuing seasoned equity. The *Overvalued* indicator is significant and positive with both the book and market leverage specifications in case of the RKRV model (Models 5 & 7) and also with the book leverage-RIVM specification (Model 1). Similarly, out of the leverage indicators, only *Overlevered* is significant in case of one specification i.e. market leverage-residual income (RIV) specification (Model 3). All the other indicator variables are insignificant in all the models. On the other hand, when taken in combination, only the interaction terms of Overlevered-Overvalued and Underlevered-Overvalued are found to be significant determinants of the SEO decision. Overlevered-Overvalued is significant and positive with both measures of leverage in case of the residual income model (model 1&3), while Underlevered-Overvalued is consistently significantly positive consistently across all leverage and valuation models. Overall, the findings show that firms that are overvalued are most likely to announce seasoned equity with being Overlevered as a second main determinant.

Among control variables size and sales growth are found to be positive and significant determinants of the SEO decision. This finding is logical when combined with the overvaluation results that larger firms may have incentives for exploitation of an overvalued stock. This is also supported by a significant cash variable with negative sign in all the models. It means that firms holding more cash (having a shortage of cash) are less (more) likely to issue seasoned equity, respectively.

**Insert table 3 here**

* 1. **Analyzing the Market Reaction to SEOs**

In previous section we found that after equity misvaluation, capital structure adjustment is a second major determinant of the SEO decision. Our logit model results suggest that firms might go for secondary equity issue when overvalued as well as overlevered thereby seeking a correction towards the target leverage by exploiting the equity misvaluation. Here, we examine whether the market recognizes and incorporates this fact in prices over the short as well as long run.

We estimate the short term price reaction to SEO announcements by sample firms classified on the basis of capital structure deviations and equity valuations through 3-days CARs (%). For this purpose, we run panel regressions of 3-day CARs over leverage and valuation dummies based on terciles (as detailed in section 4.1 above) and controlling for other important factors.

Table 4 presents results of the models explaining the relationships of 3-days CARs and leverage and valuation individually (Models 1, 3, 5 & 7) as well as jointly (Models 2, 4, 6 & 8). Where, Models 1 to 4 report the outcomes for book leverage and market leverage respectively using the residual income valuation model (RIVM) as equity valuation tool while column 5 to 8 show the outcomes for book leverage and market leverage respectively with Rhodes Kropf and Viswanathan Valuation model (RKRV) used as equity valuation method. The results for individual leverage & valuation effects show that the indicator variables are insignificant except for overlevered which is positive across all the specifications and is significant at 5% in Models 3 & 7. On the other hand, the valuation indicators are insignificant with undervalued showing negative sign consistently while overvalued being positive & insignificant in two of the four specifications. From among the control variables, Firm size and proxies of cash holding and cash flow (i.e., cash & short term investments and Non-operating cash ratio, respectively) are significant. Size is significant and positive while both the cash related variables are negative and significant across the models. This shows that SEO announcement by firms that are larger and/or have a shortage of cash may receive a positive price reaction.

**Insert table 4 here**

On the other hand, when the combined effect of leverage and valuation is checked for market reaction (Models 2,4,6 & 8), we find that the interaction term of overlevered and overvalued is positive across all the specifications and significant for both the book and market proxies of leverage with the RIVM valuation model (Models 2&4). This is quite in line with the cost-of adjustment assumption that firms that are overlevered would find it more cost effective to adjust their deviations, when overvalued at the same time through a secondary issue. The market also recognizes this fact and reacts therefore positively. On the other hand, the interaction of underlevered and undervalued has a negative sign in all but one of the models and is negative and significant at 5% in Model 6 based on book leverage and RKRV valuation. This also confirms one of our main hypotheses that a capital structure adjustment through SEO offerings by underlevered and undervalued firms would destroy market value and that the market would most negatively react to such SEO announcements. The findings on the other control variables are mostly the same as in case of individual effects regressions.

These findings show, as expected, that the market react positively to SEO announcements made by overlevered-overvalued firms. Moreover, larger firms also receive positive reaction to SEO announcements. The consistent negative signs on cash related variables are also in line with the expectations. The market reacts negatively to SEO announcements when firms hold more cash and abundant cash flows. In other words, firms having shortage of cash or cash flows would be more welcomed by the market when they make SEO announcements. However, these findings reflect a need for analyzing whether the market also reacts positively to SEO announcements by overlevered-overvalued firms and that hold more cash, so as to appraise whether the main motive was leverage driven or a short term exploitation. We, check for this possibility in robustness checks in a later section.

Next, we use the buy and hold abnormal returns to check for the long-term market impact of the SEOs. To this end, we repeat the above analysis by replacing the 3-days CARs by 5-years buy and hold abnormal returns (BHARs) as the dependent variable. The BHARs were calculated using the value weighted Buy and Hold returns with annual rebalancing. We required the availability of a minimum of 12 months of return data for our estimations of the Buy & Hold returns, while the abnormal returns were calculated over a period of 60 months.

Findings of our regressions of the BHARs are reported in Table 5. As before, the Odd numbered Models i.e., 1,3 ,5 & 7 (Even numbered *models i.e.,* 2,4,6 & 8) represent the results for individual impact (joint impact) of leverage and valuation indicators on BHARs. Results of the individual impacts show that underlevered is insignificant in all but one model, where it is positive and significant at 10% level (Model 5). On the other hand, overlevered is positive and significant in three of the four models (Models 1, 3 & 5). Similarly, the overvalued is positive and significant at 10% in both the RKRV models i.e., with market and book leverage. The undervalued indicator is not only negative but also insignificant in three out of the four models. Moreover, this time we find that firm size and sales growth have a positive and significant impact on the long run Buy & Hold returns. The consistent positive sign and significance on the sales growth variable also reflects the fact that growing firms also receive positive long-term reaction from the market for secondary equity issues.

**Insert table 5 here**

Table 5 also shows the results of the tests for the combined impact of leverage and valuation on the long run performance of SEOs (Models 2, 4, 6 & 8). From amongst the main indicator variables, the interaction terms of *Overlevered-Overvalued* and *Underlevered-Undervalued* are significant. The *Overlevered-Overvalued* interaction term is positive and significant at 5% in case of both the book leverage and market leverage models under the RKRV valuation model. On the other hand, the *Underlevered-Undervalued* interaction is insignificant in all the specifications however having a negative sign in most of the models. This shows, as hypothesized, that SEOs by firms that are both overlevered and overvalued generate positive long term returns while on the other hand the market reacts negatively to SEOs by firms that are underlevered and undervalued as these issues destroy market value. Moreover, the results from other control factors once again show firm size and sales growth to have generated positive and significant long-term market reactions.

These findings once again confirm our main hypotheses that firms that are levered above their targets and are also overvalued at the same time, would receive the most positive reaction from the market (even in the long run) when they go for secondary issue of equity. On the other end, since firms that are both underlevered and undervalued destroy firm value, if they issue a secondary equity, they receive the most negative reaction from the market. Moreover, the consistently significant sales growth variable shows that firms that are growing, receive a positive reaction to SEO announcements. While, this seems logical when seen in the underinvestment lens, that growth firms would find it advantageous to issue equity when it is overpriced, it is however tempting us to further analyze that whether it is the capital structure adjustment or the growth opportunities or both in combination that might have generated the long term positive reaction. We investigate this issue in further detail in the next section i.e., robustness checks.

* 1. **Robustness Checks**

In this section, we conduct some robustness checks. Specifically, we test for: (i) whether firms’ decision to issue seasoned equity is driven by a shortage of cash i.e., a short term exploitation of the overpriced equity; (ii) whether the short and long term positive market reactions to SEOs is a result of overvaluation and future growth opportunities and not just for leverage adjustment, and finally (iii) whether pre-event overlevered firms effectively reduced their leverage deviations through the SEOs and how long their deviations remained stable after the event.

* + 1. **Short Term Exploitation as Motive of SEO Announcement**

The literature on the determinants of Seasoned Equity Offerings suggests that firms that are short of cash may also likely issue seasoned equity in order to take advantage of short-term mispricing as it arises. In other words, firms that are short of cash and their equity is overvalued in the market, would be more likely to issue seasoned equity. Moreover, our results for the determinants of SEOs in section 4.1 and for the short-term market reaction (CARs) to SEOs in section, 4.2 show that the cash holding and cash flow variables were highly significant with negative signs. This indicated that cash shortage is a determinant of the SEO decision and that the market would positively react to SEOs made by firms with low cash holding or having cash flow problems, and vice versa. Therefore, as a further robustness check, here we are interested to study the cash motive in combination with the capital structure motive and see whether firms had a capital structure adjustment, a cash shortage or both, as the motive to issue seasoned equity.

For this purpose, we classified firms based on their cash holding. In order to identify a firm as having a shortage or excess of cash we first calculated industry median cash ratios for all the firms in the sample. Taking this industry median cash ratio as a firm’s target cash ratio, cash- holding deviations were calculated for each firm. Next, we classified the whole sample of our SEO firms into terciles based on their cash deviations. We then created two dummy variables *OverCash* and *UnderCash* such that *OverCash* (*UnderCash*) takes the value of 1 for firms in the upper (lower) tercile and zero otherwise. We assume firms in the middle tercile as those having cash holding close to the target. Next, we re-estimate the logit model (of section 4.1) of the determinants of SEO decision including these new cash related indicator variables.

Table 6 below reports results of our re-estimation of logit regressions of the determinants of SEO decision. Models 1, 3, 5 & 7 show the results of models with *OverCash* and *UnderCash* indicator variables included separately along with leverage and valuation indicators, as determinants of the SEO decision. These results, mostly weak, show that the cash indicators are insignificant. Out of the leverage and valuation indicator variables only *Overvalued* is significant with a positive sign showing that overvalued firms will be more likely to issue a seasoned equity. On the other hand, Models 2, 4, 6 & 8 show results for cash, leverage and valuation variables crossed in different combinations to find the combined impact of these factors on the SEO decision. The results are mostly insignificant and weak. *Overlevered-Undervalued-OverCash* and *Underlevered-Undervalued-OverCash* are significant in one for each of the four models at 10% both carrying negative signs as expected. This finding, though weak, is logical in that firms that are above or below the target leverage may not issue seasoned equity if their equity is undervalued and they have more cash, as this would mean a cash and value destroying decision. Similarly, *Overlevered-Overvalued-UnderCash* is significant 10% and positive in only one of the models. This finding is again as expected and shows that firms will more likely issue secondary equity when overlevered and short of cash. However, the results are weak.

**Insert table 6 here**

These findings show that while leverage, valuation and cash are all determinants of an SEO decision, but when taken in combination the valuation and leverage motives seem to be relatively stronger motivations as opposed to cash or short term exploitation.

* + 1. **Growth Opportunities, Capital Structure and SEO Market-Reaction**

We test whether positive short-term and long-term market reaction to SEOs in our sample was driven solely by an adjustment of the capital structure or a cost effective financing of existing growth opportunities or both. In order to test for this, we classify our sample firms this time based on Market to Book (MTB) Ratio. We calculated industry median MTB ratios for each firm and then created a dummy variable *Growth* which takes a value of 1 for firms that have their MTB ratio above the industry median and 0 otherwise. Next, we re-estimate our market reaction regressions (CARs and BHAR) of section 4.2 thereby including the *Growth* dummy in combination along with leverage and valuation indicators.

Results of our regressions of growth leverage and SEO market-reaction are reported in Table 7 below. Models 1 to 4 show the results of short-term price reaction (3-days CARs) and Models 5 to 8 show the results of long term reaction (BHAR). The results on the CARs show that out of all the models using different specifications of leverage and valuation in combination with the *Growth* indicator, the interaction terms are insignificant except for *Underlevered-Overvalued-Growth* which is positive and significant at 5% in one out of the four models. This finding supports the growth opportunities motive and its recognition by the market as witnessed in positive CARs. In other words, the market favorably reacted to SEO announcements by firms having growth opportunities at a time when their equity was overvalued. On the other hand, results of the BHARs are mostly similar with the interaction terms being insignificant except for the *Underlevered-Undervalued-Growth* which is significant (at 10%) in only one of the four model specifications.

Overall, these findings reflect that when tested for the market reaction (both short term and long term) of SEO announcement including leverage valuation and growth as separate explanatory variables (Section 4.2 & 4.3), the results indicated a positive reaction to leverage adjusting firms announcing SEOs. However, the introduction of this new dimension, growth, in combination with leverage and valuation has turned the results insignificant, showing that leverage adjustments are the main reason for market reaction.

**Insert table 7 here**

* + 1. **Post SEO Leverage Deviations**

Our third area of concern in robustness checks is to confirm whether the leverage deviations remained stable, at least for a reasonable time in the future, after the SEOs for firms that were seeking a capital structure adjustment.

In order to achieve this, we followed our sample firms up to 3 and 5 years after the event. We re-estimated leverage deviations for the years event-year+3 and event-year+5 for all the leverage-and-valuation based classes of the sample firms. Next, we tested whether the average deviations of capital structure-adjusting firms, in the years event-year+3 and event-year+5, were significantly different from zero. Hence, if the average leverage deviations were not significantly different from zero we would deduce that the firms achieved their objective of adjusting down their leverage to the target leverage and thus minimizing their deviations to zero.

Results of the average post-SEO leverage deviations are shown in Table 8 below. Panel-A (Panel-B) shows the results for the leverage-valuation classes based on the RKRV market-to- book decomposition (RIM-Residual Income) valuation model. Results in Panel-A show that the one sample difference of mean t-test for the ex-ante Overlevered firms is insignificant for both the event-year+3 and event-year+5 hence making the null hypothesis acceptable that the average deviations are equal to zero. On the other hand, results with the RKRV valuation model in Panel-B show that in the event-year+3 the ex-ante Overlevered firms (whether Overvalued or Undervalued) had average leverage deviations significantly different from zero. While the in the event-year+5 the Overlevered-Overvalued firms had average leverage deviations significantly different from zero, all the other classes had their deviations equal to zero. Overall, post event evidence suggests that on the average overlevered firms reduced their deviations from the target and that their leverage levels mainly stayed around the targets till at least 3 years after the secondary equity issues.

**Insert table 8 here**

1. **Conclusion**

We extend the literature on the market reaction to secondary equity offerings, by relating capital structure and valuation motives and controlling for the potential impact of other important determinants. The trade-off theory suggests that overlevered firms can get benefit from SEOs that enable them to lower their capital structure and move towards the optimal leverage. The market timing theory suggests that an overvalued firm can get benefit from equity issuance at less issuance cost and meet its financial needs. We evaluate both of these theories in a unified framework by considering that firms have target capital structures and since adjustment to the target is often costly, firms may find it beneficial to adjust positive deviations from targets through seasoned equity issuance at times when the equity is overvalued. Our main hypotheses are that firms will more likely issue seasoned equity when they are overlevered and overvalued and overlevered and get a favorable market reaction as compared to when they are underlevered and undervalued. This is because overvalued firms already have buffer to incorporate the decrease in value when supply increases. On the other hand, undervalued firms have not much choice except share repurchases or an increase in the level of debt. Moreover, an important implication of the tradeoff theory is that growth firms may find it costly to issue further debt for financing their growth if they are already overlevered. We, therefore also test whether growth opportunities and capital structure combination have an impact over the SEO decision and/or the subsequent market reactions.

Our results suggest that capital structure, cash holding, growth and valuation are important determinants of an SEO announcement when seen in isolation. However, consistent with our hypothesized predictions, when taken in combination, it is found that in contrast to cash and growth, leverage and valuation are important determinants of an SEO decision.

Our results regarding the market reactions also show, controlling for the possible effect of growth opportunities, that leverage deviation and misvaluation have important effects on the short term and long term market reactions to these SEO announcements. In summary, our finding is that adjustments in capital structure will increase value for SEOs when firms are overlevered and overvalued. Firms can get more benefit if they integrate leverage and valuation into their decision to announce seasoned equity offerings. Our findings thus support the implications of both the trade-off theory and market timing theory of capital structure. Furthermore, we could not distinguish between the abnormal stock returns to SEOs if there is some news prevailing in the market on the same day as the SEOs are announced. Moreover, our results about the determinants of SEO decisions ignored the effect of corporate governance factors of firms for example the CEO’s compensation, her various characteristics and in particular her risk preferences. As the CEO compensation increases, which makes them risk taker and align their interest with shareholders. It means financing policy could be affected by CEO compensation structure as well. Future studies could therefore assess whether corporate governance factors of firms such as CEO compensation and her risk preferences do have an impact on the determinants and market’s reaction to SEO offerings.

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**Table 1:** Predictions about the influence of target capital structure and equity mispricing on SEO’s (Bonaimé et al., 2014)

|  |  |  |
| --- | --- | --- |
|  | **Equity overvalued**(Equity mispricing: issue equity) | **Equity undervalued**(Equity mispricing: repurchase equity) |
| **Firm overlevered**(Trade-off theory: issue equity and/or decrease debt) | Medium announcement returns | Lowest announcement returns |
| **Firm underlevered**(Trade-off theory: increase debt and/or repurchase equity) | Lowest announcement returns | Negative announcement returns |

*Note:* This table presents our major hypotheses. The columns indicate whether the firm is overvalued or undervalued while the rows indicate whether the firm is overlevered or underlevered. **Table 2:** Summary Statistics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Year  | BHAR (N) | Median BHARs (%) | CAR (N) | Median CARs (%) | VP(RKRV) | VP(RIM) | Deviation |
| Market  | Book  |
| 2004 | 105 | 1.8858% | 119 | -1.99% | 0.5707 | 0.3087 | 0.0626 | 0.0705 |
| 2005 | 100 | -0.2236% | 117 | -1.18% | 0.5697 | 0.3061 | 0.0557 | 0.0427 |
| 2006 | 121 | 0.6760% | 142 | -1.28% | 0.5563 | 0.3390 | 0.0577 | 0.0621 |
| 2007 | 94 | 1.9211% | 123 | -1.23% | 0.5512 | 0.3627 | 0.1266 | 0.0933 |
| 2008 | 55 | 4.9767% | 65 | -4.76% | 0.5597 | 0.3858 | 0.0425 | 0.0422 |
| 2009 | 195 | 3.2453% | 205 | -7.21% | 0.5742 | 0.3589 | 0.3687 | 0.1976 |
| 2010 | 173 | 4.1062% | 202 | -5.19% | 0.5549 | 0.4451 | 0.0590 | 0.0244 |
| 2011 | 178 | 1.9496% | 206 | -5.68% | 0.5549 | 0.4746 | 0.0865 | 0.0431 |
| 2012 | 196 | 1.4114% | 238 | -6.67% | 0.5204 | 0.4861 | 0.0829 | 0.0483 |
| 2013 | 62 | 1.0885% | 308 | -3.70% | 0.5122 | 0.4879 | 0.1001 | 0.0893 |
| Total  | 1279 | 2.1037% | 1725 | -3.89% | 0.5513 | 0.4019 | 0.1042 | 0.0714 |
| *Note:* This table presents a brief overview of the seasoned equity announcements done by the sample firms, the median 3-day CARs (%) and the median 60-months BHARs for each year. Deviation represents distance between observed and target leverage, measured using book leverage as well as market leverage with targets calculated from annual cross-sectional Tobit regressions of leverage determinants. VP (RIVM) is the value to stock price ratio measured by Residual Income Valuation Model and VP (RKRV) is the value to stock price ratio measured by Market-To-Book Decomposition Method of (RKRV). |

**Table 3:** Determinants of the SEO Decision

|  |  |  |
| --- | --- | --- |
| Valuation Measure | RIVM | RKRV |
| Leverage Measure | Book | Market | Book | Market |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Underlevered | 0.012 |  | 0.015 |  | 0.0106 |  | 0.0191 |  |
|  | (-0.015) |  | (-0.014) |  | (-0.0149) |  | (0.0159) |  |
| Overlevered | 0.004 |  | 0.0327\*\* |  | 0.0019 |  | 0.0012 |  |
|  | (-0.014) |  | (-0.014) |  | (-0.0135) |  | (0.0137) |  |
| Undervalued | 0.015 |  | 0.021 |  | -0.0185 |  | -0.0180 |  |
|  | (-0.014) |  | (-0.016) |  | (-0.0151) |  | (0.0151) |  |
| Overvalued | 0.0327\*\* |  | 0.003 |  | 0.0285\* |  | 0.0284\* |  |
|  | (-0.014) |  | (-0.014) |  | (-0.0147) |  | (0.0147) |  |
| Overlevered\*Overvalued |  | 0.0353\*\* |  | 0.0317\* |   | 0.0197 |  | 0.0246 |
|  |  | (-0.017) |  | (-0.017) |   | (-0.0172) |  | (0.0181) |
| Underlevered\*Overvalued |  | 0.0322\* |  | 0.0427\*\* |   | 0.0518\*\*\* |  | 0.0548\*\*\* |
|  |  | (-0.019) |  | (-0.018) |   | (-0.0186) |  | (0.0206) |
| Overlevered\*Undervalued |  | 0.017 |  | 0.011 |   | -0.0040 |  | -0.0289 |
|  |  | (-0.016) |  | (-0.016) |   | (-0.0186) |  | (0.0193) |
| Underlevered\*Undervalued |  | -0.008 |  | 0.024 |   | -0.0120 |  | 0.000814 |
|  |  | (-0.018) |  | (-0.018) |   | (-0.0177) |  | (0.0193) |
| FixedAssets | -0.043 | -0.043 | -0.044 | -0.045 | -0.0471 | -0.0468 | -0.0485 | -0.0478 |
|  | (-0.047) | (-0.047) | (-0.047) | (-0.047) | (-0.0467) | (-0.0466) | (0.0466) | (0.0465) |
| NOPCashFlow | 0.000 | 0.000 | 0.000 | 0.000 | 0.0003 | 0.0003 | 0.0003 | 0.000280 |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (-0.0004) | (-0.0004) | (0.0004) | (0.0004) |
| FirmSize | 0.0215\*\*\* | 0.0215\*\*\* | 0.0219\*\*\* | 0.0220\*\*\* | 0.0205\*\*\* | 0.0213\*\*\* | 0.0210\*\*\* | 0.0212\*\*\* |
|  | (-0.001) | (-0.001) | (-0.001) | (-0.001) | (-0.0015) | (-0.0013) | (0.0015) | (0.0015) |
| SalesGrowth | 0.00598\*\* | 0.00609\*\* | 0.00600\*\* | 0.00605\*\* | 0.00683\*\* | 0.00649\*\* | 0.00686\*\* | 0.00681\*\* |
|  | (-0.003) | (-0.003) | (-0.003) | (-0.003) | (-0.0028) | (-0.0028) | (0.0028) | (0.0028) |
| SEOPlanSize | -0.00144\*\*\* | -0.00143\*\*\* | -0.00144\*\*\* | -0.00143\*\*\* | -0.00141\*\*\* | -0.00141\*\*\* | -0.00141\*\*\* | -0.00141\*\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (-0.0002) | (-0.0002) | (0.0002) | (0.0002) |
| CashFlowVar | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| CashHolding | -0.0576\*\*\* | -0.0582\*\*\* | -0.0575\*\*\* | -0.0581\*\*\* | -0.0577\*\*\* | -0.0577\*\*\* | -0.0577\*\*\* | -0.0579\*\*\* |
|  | (-0.016) | (-0.016) | (-0.016) | (-0.016) | (-0.0156) | (-0.0156) | (0.0156) | (0.0156) |
| MTB | -0.00599\* | -0.00623\* | -0.00597\* | -0.00592\* | -0.00608\* | -0.00615\* | -0.00606\* | -0.00624\*\* |
|  | (-0.003) | (-0.003) | (-0.003) | (-0.003) | (-0.0032) | (-0.0032) | (0.0032) | (0.0032) |
| Constant | -0.0751\*\*\* | -0.0620\*\*\* | -0.0828\*\*\* | -0.0712\*\*\* | -0.0517\*\* | -0.0573\*\*\* | -0.0593\*\* | -0.0568\*\* |
|   | (-0.022) | (-0.020) | (-0.023) | (-0.020) | (-0.0256) | (-0.0216) | (0.0273) | (0.0237) |
| Observations | 7066 | 7066 | 7066 | 7066 | 7066 | 7066 | 7,066 | 7,066 |
| R-squared | 0.046 | 0.047 | 0.046 | 0.047 | 0.047 | 0.047 | 0.047 | 0.047 |
| No of firms | 884 | 884 | 884 | 884 | 884 | 884 | 884 | 884 |
| Robust standard errors stated below the coefficients |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |
| *Note:* This table presents the results of logit regressions of the SEO announcement dummy over indicators of valuation and leverage and other possible determinants. The odd-numbered models (i.e. Model 1,3,5 and 7) have leverage and valuation indicators included separately while even-numbered models (i.e. 2,4,6 & 8 ) are based on interactions of the leverage and valuation indicators to capture the combined effect of these factors. Column 1 and 3 (5 and 7) report the outcomes for book leverage targets and for valuation using RIVM (RKRV) model. Column 2 and 4 (6 and 8) report the outcomes for market leverage targets and for valuation using RIVM (RKRV) model. Valuation and leverage are binary coded variables such that observations which are above (below) the middle tercile are coded as over (under) levered or valued. Control variables include; FixedAssets (measured as the value of fixed assets scaled by total assets), NOPCashFlow (measured as Non-operation cash flow divided by total assets), FirmSize which is the natural log of market capitalization. SalesGrowth measured as the percentage change in sales over last year, SEOPlanSize (the announced or declared size of secondary issue, CashFlowVar which is the standard deviation of cash flow (calculated over a 5-year period ending prior fiscal year so that we require a minimum of 3 years of available cash flow data), CashHolding (measured as cash and short-term investments and property divided by total assets) and MTB is the Market to book ratio calculated as the market capitalization scaled by book value of total assets. Asterisks \*\*\*, \*\*, or \* show significance level at the 1%, 5% or 10%, respectively. |

**Table 4:** Short Term Market Reaction to SEOs

|  |  |  |
| --- | --- | --- |
| Valuation Measure | RIVM | RKRV |
| Leverage Measure | Book | Market | Book | Market |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Underlevered | 0.0003 |  | -0.0114 |  | 0.0009 |  | -0.0107 |  |
|  | (-0.0113) |  | (-0.0120) |  | (-0.0112) |  | (-0.0121) |  |
| Overlevered | 0.0121 |  | 0.0227\*\* |  | 0.0126 |  | 0.0239\*\* |  |
|  | (-0.0103) |  | (-0.0103) |  | (-0.0104) |  | (-0.0103) |  |
| Undervalued | -0.0114 |  | -0.0120 |  | -0.0010 |  | -0.0004 |  |
|  | (-0.0130) |  | (-0.0130) |  | (-0.0105) |  | (-0.0104) |  |
| Overvalued | 0.0026 |  | 0.0016 |  | -0.0042 |  | -0.0060 |  |
|  | (-0.0132) |  | (-0.0131) |  | (-0.0115) |  | (-0.0113) |  |
| Overlevered\*Overvalued | 0.023\* |  | 0.0265\* |   | 0.0178 |  | 0.0104 |
|  |  | (-0.0142) |  | (-0.0144) |   | (-0.0171) |  | (-0.0133) |
| Underlevered\*Overvalued | 0.0164 |  | -0.0041 |   | -0.0074 |  | 0.0027 |
|  |  | (-0.0131) |  | (-0.0140) |   | (-0.0148) |  | (-0.0139) |
| Overlevered\*Undervalued | 0.0014 |  | -0.0004 |   | 0.0088 |  | 0.0002 |
|  |  | (-0.0145) |  | (-0.0130) |   | (-0.0143) |  | (-0.0143) |
| Underlevered\*Undervalued | -0.0112 |  | -0.0128 |   | -0.0281\*\* |  | 0.0013 |
|  |  | (-0.0141) |  | (-0.0155) |   | (-0.0113) |  | (-0.0146) |
| Fixed Assets | -0.0683 | -0.0677 | -0.0725 | -0.0718 | -0.0652 | -0.0646 | -0.0697 | 0.0033 |
|  | (-0.0500) | (-0.0499) | (-0.0503) | (-0.0499) | (-0.0503) | (-0.0487) | (-0.0506) | (-0.0096) |
| NOPCashFlow | -0.0238\*\* | -0.0230\*\* | -0.0252\*\* | -0.0236\*\* | -0.0238\*\* | -0.0244\*\* | -0.0252\*\* | -0.0145\*\* |
|  | (-0.0106) | (-0.0104) | (-0.0101) | (-0.0104) | (-0.0108) | (-0.0106) | (-0.0102) | (-0.0062) |
| FirmSize | 0.00522\*\* | 0.00542\*\* | 0.00439\* | 0.00505\*\* | 0.00496\*\* | 0.00484\*\* | 0.00407\* | 0.0018 |
|  | (-0.0024) | (-0.0024) | (-0.0023) | (-0.0024) | (-0.0024) | (-0.0023) | (-0.0023) | (-0.0013) |
| SalesGrowth | -0.0032 | -0.0030 | -0.0031 | -0.0029 | -0.0033 | -0.0030 | -0.0034 | 0.0020 |
|  | (-0.0023) | (-0.0023) | (-0.0023) | (-0.0023) | (-0.0023) | (-0.0023) | (-0.0023) | (-0.0016) |
| SEOPlanSize | -0.0002 | -0.0002 | -0.0003 | -0.0002 | -0.0002 | -0.0003 | -0.0003 | 0.0001 |
|  | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0001) |
| CashFlowVar | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|  | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| CashHolding | -0.0351\*\* | -0.0344\*\* | -0.0362\*\* | -0.0361\*\* | -0.0370\*\*\* | -0.0393\*\*\* | -0.0382\*\*\* | -0.0262\*\* |
|  | (-0.0141) | (-0.0141) | (-0.0142) | (-0.0143) | (-0.0143) | (-0.0142) | (-0.0144) | (-0.0107) |
| MTB | 0.0072 | 0.0074 | 0.0068 | 0.0064 | 0.0068 | 0.0066 | 0.0064 | 0.0080 |
|  | (-0.0095) | (-0.0094) | (-0.0094) | (-0.0095) | (-0.0095) | (-0.0095) | (-0.0094) | (-0.0058) |
| Constant | -0.0382 | -0.0419 | -0.0231 | -0.0351 | -0.0361 | -0.0095 | -0.0200 | -0.0450\*\* |
|   | (-0.0383) | (-0.0372) | (-0.0370) | (-0.0362) | (-0.0388) | (-0.0327) | (-0.0376) | (-0.0204) |
| Observations | 1309 | 1,309 | 1309 | 1,309 | 1,309 | 1,309 | 1,309 | 1,309 |
| R-squared | 0.085 | 0.089 | 0.092 | 0.087 | 0.080 | 0.085 | 0.088 | 0.071 |
| No of firms | 703 | 703 | 703 | 703 | 703 | 703 | 703 | 703 |
| Robust standard errors stated below the coefficients |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |
| Note:This table presents results of the models explaining the relationships of 3-days CARs and leverage and valuation individually (Models 1, 3, 5 & 7) as well as jointly (Models 2, 4, 6 & 8). Where, Models 1 to 4 report the outcomes for book leverage and market leverage respectively using the residual income valuation model (RIVM) as equity valuation tool while column 5 to 8 show the outcomes for book leverage and market leverage respectively with Rhodes Kropf and Viswanathan Valuation model (RKRV) used as equity valuation. Valuation and leverage are binary coded variables such that observations which are above (below) the middle tercile are coded as over (under) levered or valued. Control variables include; FixedAssets (measured as the value of fixed assets scaled by total assets), NOPCashFlow (measured as non-operation cash flow divided by total assets), FirmSize which is the natural log of market capitalization. SalesGrowth measured as the percentage change in sales over last year, SEOPlanSize (the announced or declared size of secondary issue, CashFlowVar which is the standard deviation of cash flow (calculated over a 5-year period ending prior fiscal year so that we require a minimum of 3 years of available cash flow data), CashHolding (measured as cash and short-term investments and property divided by total assets) and MTB is the Market to book ratio calculated as the market capitalization scaled by book value of total assets. Asterisks \*\*\*, \*\*, or \* show significance level at the 1%, 5% or 10%, respectively. |

**Table 5:** Long Term Market Reaction (BHAR) to SEOs

|  |  |  |
| --- | --- | --- |
| Valuation Measure | RIVM | RKRV |
| Leverage Measure | Book | Market | Book | Market |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Underlevered | 0.0128 |  | 0.00156 |  | 0.0138\* |  | 0.00180 |  |
|  | (0.00798) |  | (0.00768) |  | (0.00796) |  | (0.00768) |  |
| Overlevered | 0.0157\* |  | 0.0149\* |  | 0.0150\* |  | 0.0137 |  |
|  | (0.00865) |  | (0.00864) |  | (0.00863) |  | (0.00874) |  |
| Undervalued | -0.00597 |  | -0.00566 |  | 5.88e-05 |  | -7.43e-06 |  |
|  | (0.00973) |  | (0.00975) |  | (0.00772) |  | (0.00781) |  |
| Overvalued | 0.0108 |  | 0.0113 |  | 0.0159\* |  | 0.0151\* |  |
|  | (0.00981) |  | (0.00979) |  | (0.00840) |  | (0.00843) |  |
| Overlevered\*Overvalued |  | 0.0153 |  | 0.00884 |   | 0.0249\*\* |  | 0.0318\*\* |
|  |  | (0.0116) |  | (0.0121) |   | (0.0123) |  | (0.0124) |
| Underlevered\*Overvalued |  | 0.0154 |  | 0.00107 |   | 0.0196\* |  | 0.00325 |
|  |  | (0.00995) |  | (0.00982) |   | (0.0117) |  | (0.0117) |
| Overlevered\*Undervalued |  | 0.00515 |  | 0.00346 |   | 0.0110 |  | 0.00595 |
|  |  | (0.0113) |  | (0.0111) |   | (0.0126) |  | (0.0161) |
| Underlevered\*Undervalued |  | 0.00474 |  | -0.00851 |   | 0.0103 |  | -0.00291 |
|  |  | (0.0110) |  | (0.0120) |   | (0.0100) |  | (0.0109) |
| FixedAssets | -0.00327 | -0.00188 | -0.00303 | -0.000536 | 0.00471 | 0.00361 | 0.00496 | 0.00360 |
|  | (0.0108) | (0.0108) | (0.0108) | (0.0107) | (0.0109) | (0.0108) | (0.0109) | (0.0108) |
| NOPCashFlow | 0.000339 | 0.000658 | 0.000539 | 0.000268 | 0.000184 | 0.0000 | 0.000351 | 0.000397 |
|  | (0.00113) | (0.00102) | (0.00112) | (0.00101) | (0.00100) | (0.000977) | (0.000997) | (0.000970) |
| FirmSize | 0.000\*\*\* | 0.000\*\*\* | 0.000\*\*\* | 0.000\*\*\* | 0.000\*\*\* | 0.000\*\*\* | 0.000\*\*\* | 0.000\*\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| SalesGrowth | 0.00398\* | 0.00404\* | 0.00402\* | 0.00397\* | 0.00460\*\* | 0.00450\*\* | 0.00461\*\* | 0.00452\*\* |
|  | (0.00225) | (0.00225) | (0.00224) | (0.00225) | (0.00227) | (0.00226) | (0.00226) | (0.00226) |
| SEOPlanSize | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| CashFlowVar | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| CashHolding | -0.000946 | -0.000859 | -0.00219 | -0.00199 | -0.000408 | -0.000649 | -0.00183 | -0.00141 |
|  | (0.0126) | (0.0126) | (0.0125) | (0.0125) | (0.0125) | (0.0124) | (0.0125) | (0.0124) |
| MTB | 0.0001 | -0.000108 | -0.000229 | 0.0000 | 0.0005 | 0.000542 | 0.000170 | -0.0001 |
|  | (0.00285) | (0.00284) | (0.00291) | (0.00284) | (0.00281) | (0.00286) | (0.00289) | (0.00284) |
| Constant | -0.00865 | -0.00295 | -0.00401 | 0.00207 | -0.0166 | -0.00755 | -0.0108 | -0.00454 |
|   | (0.0120) | (0.00931) | (0.0118) | (0.00902) | (0.0104) | (0.00885) | (0.0101) | (0.00871) |
| Observations | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 |
| R-squared | 0.011 | 0.007 | 0.011 | 0.005 | 0.012 | 0.011 | 0.011 | 0.012 |
| No of firms | 724 | 724 | 724 | 724 | 724 | 724 | 724 | 724 |
| Robust standard errors stated below the coefficients |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |
| *Note:* This table shows the impact of leverage and valuation on the long run performance of SEOs. Odd numbred Models i.e. 1, 3, 5 & 7 (Even numbered models i.e. 2, 4, 6 & 8) represent the results for individual impact (joint impact) of leverage and valuation indicators on BHARs. Where, Models 1 to 4 report the outcomes for book leverage and market leverage respectively using the residual income valuation model (RIVM) as equity valuation tool while column 5 to 8 show the outcomes for book leverage and market leverage respectively with Rhodes Kropf and Viswanathan Valuation model (RKRV) used as equity valuation. Valuation and leverage are binary coded variables such that observations which are above (below) the middle tercile are coded as over (under) levered or valued. Control variables include; FixedAssets (measured as the value of fixed assets scaled by total assets), NOPCashFlow (measured as non-operation cash flow divided by total assets), FirmSize which is the natural log of market capitalization. SalesGrowth measured as the percentage change in sales over last year, SEOPlanSize (the announced or declared size of secondary issue, CashFlowVar which is the standard deviation of cash flow (calculated over a 5-year period ending prior fiscal year so that we require a minimum of 3 years of available cash flow data), CashHolding (measured as cash and short-term investments and property divided by total assets) and MTB is the Market to book ratio calculated as the market capitalization scaled by book value of total assets. Asterisks \*\*\*, \*\*, or \* show significance level at the 1%, 5% or 10%, respectively. |

**Table 6:** Leverage, Valuation, Cash and SEO Decision

|  |  |  |
| --- | --- | --- |
| Valuation Measure | RIVM | RKRV |
| Leverage Measure | Book | Market | Book | Market |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Underlevered | 0.0114 |  | 0.0209 |  | 0.0106 |  | 0.0190 |  |
|  | (-0.0148) |  | (-0.0160) |  | (-0.0149) |  | (-0.0159) |  |
| Overlevered | 0.0043 |  | 0.0027 |  | 0.0020 |  | 0.0013 |  |
|  | (-0.0135) |  | (-0.0137) |  | (-0.0135) |  | (-0.0137) |  |
| Undervalued | 0.0153 |  | 0.0153 |  | -0.0184 |  | -0.0178 |  |
|  | (-0.0141) |  | (-0.0141) |  | (-0.0151) |  | (-0.0151) |  |
| Overvalued | 0.0326\*\* |  | 0.0326\*\* |  | 0.0285\* |  | 0.0283\* |  |
|  | (-0.0144) |  | (-0.0144) |  | (-0.0147) |  | (-0.0146) |  |
| UnderCash | -0.0040 |  | -0.0039 |  | -0.0019 |  | -0.0018 |  |
|  | (-0.0138) |  | (-0.0138) |  | (-0.0138) |  | (-0.0138) |  |
| OverCash | 0.0083 |  | 0.0082 |  | 0.0077 |  | 0.0077 |  |
|  | (-0.0220) |  | (-0.0220) |  | (-0.0220) |  | (-0.0220) |  |
| Overlevered\*Overvalued\*OverCash |  | 0.0065 |  | -0.0184 |  | 0.0214 |  | -0.0045 |
|  |  | (-0.0246) |  | (-0.0224) |  | (-0.0250) |  | (-0.0223) |
| Underlevered\*Overvalued\*OverCash |  | 0.0177 |  | 0.0046 |  | 0.0152 |  | 0.0158 |
|  |  | (-0.0276) |  | (-0.0280) |  | (-0.0264) |  | (-0.0263) |
| Overlevered\*Undervalued\*OverCash |  | 0.0216 |  | 0.0020 |  | -0.0352 |  | -0.0479\* |
|  |  | (-0.0261) |  | (-0.0245) |  | (-0.0288) |  | (-0.0265) |
| Underlevered\*Undervalued\*OverCash |  | -0.0022 |  | 0.0127 |  | -0.0402\* |  | -0.0307 |
|  |  | (-0.0245) |  | (-0.0246) |  | (-0.0236) |  | (-0.0244) |
| Overlevered\*Overvalued\*UnderCash |  | 0.0391 |  | 0.0479\* |  | -0.0011 |  | -0.0053 |
|  |  | (-0.0281) |  | (-0.0282) |  | (-0.0267)  |  | (-0.0247) |
| Underlevered\*Overvalued\*UnderCash |  | 0.0406 |  | 0.0298 |  | 0.0358 |  | 0.0190 |
|  |  | (-0.0291) |  | (-0.0300) |  | (-0.0293) |  | (-0.0311) |
| Overlevered\*Undervalued\*UnderCash |  | 0.0037 |  | -0.0058 |  | -0.0111 |  | -0.0451 |
|  |  | (-0.0278) |  | (-0.0256) |  | (-0.0309) |  | (-0.0293) |
| Underlevered\*Undervalued\*UnderCash | 0.0043 |  | 0.0212 |  | 0.0119 |  | 0.0140 |
|  |  | (-0.0286) |  | (-0.0295) |  | (-0.0256) |  | (-0.0258) |
| FixedAssets | -0.0422 | -0.0419 | -0.0440 | -0.0421 | -0.0468 | -0.0456 | -0.0482 | -0.0425 |
|  | (-0.0468) | (-0.0469) | (-0.0467) | (-0.0468) | (-0.0467) | (-0.0467) | (-0.0467) | (-0.0470) |
| NOPCashFlow | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0002 |
|  | (-0.0004) | (-0.0004) | (-0.0004) | (-0.0004) | (-0.0004) | (-0.0004) | (-0.0004) | (-0.0004) |
| FirmSize | 0.0215\*\*\* | 0.0217\*\*\* | 0.0219\*\*\* | 0.0220\*\*\* | 0.0205\*\*\* | 0.0214\*\*\* | 0.0210\*\*\* | 0.0212\*\*\* |
|  | (-0.0012 | (-0.0012) | (-0.0013) | (-0.0012) | (-0.0015) | (-0.0013) | (-0.0015) | (-0.0013) |
| SalesGrowth | 0.00596\*\* | 0.00598\*\* | 0.00598\*\* | 0.00591\*\* | 0.00681\*\* | 0.00614\*\* | 0.00683\*\* | 0.00603\*\* |
|  | (-0.0028) | (-0.0028) | (-0.0028) | (-0.0028) | (-0.0028) | (-0.0028) | (-0.0028) | (-0.0028) |
| SEOPlanSize | -0.00144\*\*\* | -0.00143\*\*\* | -0.00144\*\*\* | -0.00142\*\*\* | -0.00141\*\*\* | -0.00141\*\*\* | -0.00141\*\*\* | -0.00142\*\*\* |
|  | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) |
| CashFlowVar | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|  | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| CashHolding | -0.0732\* | -0.0556\*\*\* | -0.0730\* | -0.0477\*\* | -0.0706\* | -0.0500\*\* | -0.0705\* | -0.0495\*\* |
|  | (-0.0383) | (-0.0196) | (0.0383) | (-0.0192) | (-0.0382) | (-0.0200) | (-0.0383) | (-0.0204) |
| MTB | -0.00599\* | -0.00583\* | -0.00596\* | -0.00559\* | -0.00606\* | -0.00595\* | -0.00604\* | -0.00596\* |
|  | (-0.0033) | (-0.0033) | (-0.0033) | (-0.0033) | (-0.0032) | (-0.0032) | (-0.0032) | (-0.0032) |
| Constant | -0.0720\*\*\* | -0.0614\*\*\* | -0.0797\*\*\* | -0.0650\*\*\* | -0.0501\* | -0.0547\*\*\* | -0.0577\*\* | -0.0496\*\* |
|  | (-0.0238) | (-0.0195) | (-0.0250) | (-0.0196) | (-0.0269) | (-0.0205) | (-0.0283) | (-0.0213) |
| Observations | 7,066 | 7,066 | 7,066 | 7,066 | 7,066 | 7,066 | 7,066 | 7,066 |
| R-squared | 0.046 | 0.046 | 0.046 | 0.046 | 0.047 | 0.046 | 0.047 | 0.046 |
| No of firms | 884 | 884 | 884 | 884 | 884 | 884 | 884 | 884 |
| Robust standard errors stated below the coefficients |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |

*Note:* This table presents the results of re-estimation of logit regressions of the determinants of SEO decision including cash holding indicator variables *OverCash* and *UnderCash* such that *OverCash (UnderCash)* is 1 for firms belonging to the upper (lower) tercile based on cashholding deviations from industry median. Models 1, 3, 5 & 7 show the results of models with *OverCash* and *UnderCash* indicator variables included separately along with leverage and valuation indicators, as determinants of the SEO decision. Where, Models 1 to 4 report the outcomes for book leverage and market leverage respectively using the residual income valuation model (RIVM) as equity valuation tool while column 5 to 8 show the outcomes for book leverage and market leverage respectively with Rhodes Kropf and Viswanathan Valuation model (RKRV) used as equity valuation. Cash, Valuation and leverage are binary coded variables such that the middle leverage, value and cash holdings of firms are coded as 0 because these firms are near to optimal level. Observations which are above or below the middle level are coded as over/under Cash,leverage or valuation levels. Control variables include; FixedAssets (measured as the value of fixed assets scaled by total assets), NOPCashFlow (measured as non-operation cash flow divided by total assets), FirmSize which is the natural log of market capitalization. SalesGrowth measured as the percentage change in sales over last year, SEOPlanSize (the announced or declared size of secondary issue, CashFlowVar which is the standard deviation of cash flow (calculated over a 5-year period ending prior fiscal year so that we require a minimum of 3 years of available cash flow data), CashHolding (measured as cash and short-term investments and property divided by total assets) and MTB is the Market to book ratio calculated as the market capitalization scaled by book value of total assets. Asterisks \*\*\*, \*\*, or \* show significance level at the 1%, 5% or 10%, respectively.

**Table 7:** Growth. Leverage and SEO Market Reaction

|  |  |
| --- | --- |
| CARs | BHARs |
| Valuation Measure | RIVM | RKRV | RIVM | RKRV |
| Leverage Measure | Book | Market | Book | Market | Book | Market | Book | Market |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Overlevered\*Overvalued\*Growth | 0.0237 | 0.0205 | 0.0219 | -0.0107 | 0.00111 | 0.0001 | 0.0133 | 0.0159 |
|  | (-0.0207) | (-0.0190) | (-0.0248) | (-0.0121) | (0.0154) | (0.0150) | (0.0174) | (0.0168) |
| Underlevered\*Overvalued\* Growth | 0.0173 | 0.0089 | 0.0003 | 0.0239\*\* | 0.0151 | 0.0009 | 0.0170 | 0.0092 |
|  | (-0.0138) | (-0.0162) | (-0.0182) | (-0.0103) | (0.0130) | (0.0116) | (0.0162) | (0.0162) |
| Overlevered\*Undervalued\* Growth | 0.0056 | 0.0063 | -0.0037 | -0.0004 | 0.00697 | 0.0113 | 0.00920 | -0.0130 |
|  | (-0.0174) | (-0.0149) | (-0.0210) | (-0.0104) | (0.0164) | (0.0157) | (0.0206) | (0.0212) |
| Underlevered\*Undervalued\* Growth | -0.0013 | 0.0143 | -0.0198 | -0.0060 | -0.0036 | -0.0121 | 0.0231\* | 0.0031 |
|  | (-0.0157) | (-0.0190) | (-0.0139) | (-0.0113) | (0.0150) | (0.0164) | (0.0130) | (0.0136) |
| FixedAssets | -0.0633 | -0.0659 | -0.0656 | -0.0697 | -0.00111 | -0.0003 | 0.0000 | 0.00123 |
|  | (-0.0492) | (-0.0496) | (-0.0485) | (-0.0506) | (0.0107) | (0.0107) | (0.0108) | (0.0108) |
| NOPCashFlow | -0.0238\*\* | -0.0235\*\* | -0.0238\*\* | -0.0252\*\* | 0.0003 | 0.0002 | -0.0001 | 0.0003 |
|  | (-0.0102) | (-0.0103) | (-0.0104) | (-0.0102) | (0.0010) | (0.0010) | (0.0010) | (0.0010) |
| FirmSize | 0.00513\*\* | 0.00541\*\* | 0.00467\*\* | 0.00407\* | 7.46e-06\*\*\* | 7.44e-06\*\*\* | 8.06e-06\*\*\* | 6.81e-06\*\*\* |
|  | (-0.0025) | (-0.0024) | (-0.0023) | (-0.0023) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| SalesGrowth | -0.0028 | -0.0029 | -0.0027 | -0.0034 | 0.00401\* | 0.00389\* | 0.00425\* | 0.00429\* |
|  | (-0.0023) | (-0.0023) | (-0.0023) | (-0.0023) | (0.0022) | (0.0022) | (0.0023) | (0.0023) |
| SEOPlanSize | -0.0002 | -0.0002 | -0.0002 | -0.0003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|  | (-0.0002) | (-0.0002) | (-0.0002) | (-0.0002) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| CashFlowVar | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|  | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| CashHolding | -0.0380\*\*\* | -0.0386\*\*\* | -0.0378\*\*\* | -0.0382\*\*\* | -0.0020 | -0.0020 | -0.0019 | -0.0025 |
|  | (-0.0142) | (-0.0143) | (-0.0141) | (-0.0144) | (0.0125) | (0.0125) | (0.0125) | (0.0125) |
| MTB | 0.0128 | 0.0128 | 0.0080 | 0.0064 | 0.0005 | 0.0000 | 0.0016 | 0.0006 |
|  | (-0.0107) | (-0.0102) | (-0.0101) | (-0.0094) | (0.0029) | (0.0028) | (0.0029) | (0.0029) |
| Constant | -0.0430 | -0.0467 | -0.0329 | -0.0200 | 0.0012 | 0.0029 | -0.0019 | -0.0002 |
|  | (-0.0367) | (-0.0370) | (-0.0357) | (-0.0376) | (0.0087) | (0.0086) | (0.0087) | (0.0087) |
| Observations | 1,309 | 1,309 | 1,309 | 1,309 | 1,261 | 1,261 | 1,261 | 1,261 |
| R-squared | 0.083 | 0.082 | 0.082 | 0.088 | 0.005 | 0.005 | 0.008 | 0.006 |
| No of firms | 703 | 703 | 703 | 703 | 724 | 724 | 724 | 724 |
| Robust standard errors stated below the coefficients |  |  |  |  |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |  |  |  |  |
| *Note:* This table summarizes the regressions of growth, leverage and SEO market-reaction. Models 1 to 4 show the results of short-term price reaction (3-days CARs) and report the outcomes for book leverage and market leverage respectively using the residual income valuation model (RIVM) as equity valuation tool and Models 5 to 8 show the results of long term reaction (BHAR). Where, Models 1 to 4 reports the outcomes for residual income valuation model (RIVM) as equity valuation tool for book leverage and market leverage respectively while column 5 to 8 shows the outcomes for Rhodes Kropf and Viswanathan Valuation model (RKRV) as equity valuation tool for book leverage and market leverage respectively. Valuation and leverage are binary coded variables. We divide data into terciles. Where, the middle leverage and value firms are coded as 0 because these firms are near to optimal level. Observations which are above or below the middle level known as over/under leverage or valuation levels. For the estimation of growth variable, we calculated industry median MTB ratios for each firm and then created a dummy variable *Growth* which takes a value of 1 for firms that have MTB ratios above the industry median and 0 otherwise. Control variables include; FixedAssets (measured as the value of fixed assets scaled by total assets), NOPCashFlow (measured as non-operation cash flow divided by total assets), FirmSize which is the natural log of market capitalization. SalesGrowth measured as the percentage change in sales over last year, SEOPlanSize (the announced or declared size of secondary issue, CashFlowVar which is the standard deviation of cash flow (calculated over a 5-year period ending prior fiscal year so that we require a minimum of 3 years of available cash flow data), CashHolding (measured as cash and short-term investments and property divided by total assets) and MTB is the Market to book ratio calculated as the market capitalization scaled by book value of total assets. Asterisks \*\*\*, \*\*, or \* show significance level at the 1%, 5% or 10%, respectively. |

**Table 8:** Tests of Average Post-SEO Leverage Deviations

|  |
| --- |
| ***Panel-A: Leverage - Valuation (RKRV)*** |
|  | **Event-Year+3** | **Event-Year+5** |
| Classification (Leverage/Valuation) | N | Mean | Std. Err. | t | Sig. (2-tailed) | N | Mean | Std. Err. | t | Sig. (2-tailed) |
| Overlevered-Overvalued | 846 | .0912 | .6057 | .2221 | .8243 | 1208 | .3386 | 8.8373 | .9914 | .3217 |
| Overlevered-Undervalued | 271 | .1711 | 1.6967 | .8205 | .4127 | 384 | .2213 | 2.0190 | 1.3079 | .1917 |
| Underlevered- Overvalued | 494 | .1221 | 1.2851 | .6158 | .5383 | 669 | .0709 | .5618 | -.7195 | .4721 |
| Underlevered- Undervalued | 402 | .0741 | .2894 | -.8651 | .3875 | 558 | .0762 | .3522 | -.6944 | .4877 |
| ***Panel-B: Leverage - Valuation (RIM)*** |
|  | **Event-Year+3** | **Event-Year+5** |
| Classification (Leverage/Valuation) | N | Mean | Std. Err. | t | Sig. (2-tailed) | N | Mean | Std. Err. | t | Sig.(2-tailed) |
| Overlevered-Overvalued | 481 | .0409 | .2903 | -3.4487\*\*\* | .0006 | 635 | .0510 | .2942 | -3.0475\*\*\* | .0024 |
| Overlevered-Undervalued | 446 | .0316 | .2521 | -4.6020\*\*\* | .0000 | 542 | .0621 | .3913 | -1.4525 | .1469 |
| Underlevered- Overvalued | 497 | .0976 | .5560 | .4416 | .6590 | 684 | .1128 | .5890 | 1.1667 | .2437 |
| Underlevered- Undervalued | 405 | .1453 | 1.4283 | .8279 | .4082 | 516 | .0687 | .4936 | -.8192 | .4130 |
| *Note:* This table shows the results of our tests of average post-SEO event leverage deviations. The test used is a t-test of whether the average deviations of capital structure-adjusting firms, in the years event-year+3 and event-year+5, are significantly different from zero. Panel-A (Panel-B) shows the results for the leverage-valuation classes based on the RKRV market-to- book decomposition (RIM-Residual Income) valuation model. Standard Errors and probabilities are reported. Asterisks \*\*\*, \*\*, or \* show significance level at the 1%, 5% or 10%, respectively. |

*Figure 1: Number of SEOs announcements 2003-2014 NASDAQ and NYSE*

**Appendix-A**

**Table A-1**

**Estimating a model of leverage determinants**

|  |  |  |
| --- | --- | --- |
|   | Market Lev | Book Lev |
| Profit | 0.0655 | -0.0715 |
|   | (0.0160) | (0.0816) |
| Market to Book Ratio | -0.0003 | -0.0004 |
|   | (0.0001) | (0.0001) |
| Depreciation  | 1.5700 | 1.6626 |
|   | (0.2505) | (0.2335) |
| Tangibility  | 0.3070 | 0.2576 |
|   | (0.0560) | (0.0532) |
| R&D Expense | -0.2225 | -0.0815 |
|   | (0.0354) | (0.1017) |
| Size | -0.0402 | 0.0041 |
|   | (0.0010) | (0.0025) |
| Median leverage for Industry | 0.1192 | 0.4944 |
|   | (0.0378) | (0.0798) |
| Constant | 0.5847 | 0.0078 |
|   | (0.0391) | (0.0390) |
| Average number of Firms in yearly Regressions | 907 | 907 |
| *Note:* This table summarizes the results of estimating a Tobit model to predict leverage [both market leverage and book leverage] for a firm. The value of predicted leverage is restricted to lie between zero and 1. The values for predicted leverage used in this study are estimated on a yearly basis using the cross section of sample firms over a10-years period from 2004 to 2013. Industry dummies using the Fama and French (1997) industry definitions are included. This table presents the time series means of the coefficient estimates from the 10 yearly regressions. The significance levels are for a test of the hypothesis that the time series mean is equal to zero, using the time series standard error of the mean estimate for each coefficient. |

1. We are thankful to an anonymous referee for bringing these two important aspects to our attention. [↑](#footnote-ref-1)
2. We are thankful to an anonymous referee for highlighting this important point. [↑](#footnote-ref-2)