OVERVALUED STOCK: M&A OR SEO?

A study of the performance and decision making of overvalued firms.

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Bachelor Thesis

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Abstract:

This study examines two ways of exploiting overvalued stock by US firms: Conducting a seasoned equity offering (SEO) or a stock swap acquisition. As market misvaluations provide short-term opportunities for managers to receive large potential gains, the decision of how to utilize stock overvaluation can have a significant impact on the value created. We find stock swap acquisition to be the superior choice, providing positive effects on long-term operating performance and positive announcement returns. The SEO alternative appears, on the other hand, detrimental for firms with long-term operating performance and announcement returns being significantly negatively affected. Rather than deeming it an irrational decision by managers, we argue that the choice of pursuing an SEO can be attributed to different firm characteristics. Our findings show that firms with a high near-term cash need have a higher likelihood of conducting an SEO, while more mature firms tend to choose a stock swap acquisition instead. These findings support the expectations that more mature firms have lower immediate cash need as they generally have more established continuous cash flows, whereas younger firms require more cash due to the nature of their growth-oriented investments

Keywords:

Overvaluation, mergers and acquisitions, seasoned equity offerings, operating performance, announcement returns, firm characteristics

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1. Introduction

Few issues concerning the asymmetric nature of financial markets are equally noticeable as the discrepancies in informational power between managers and investors. This informational leverage regarding the specific firm in question incentivizes managers to act upon market opportunities in favor of existing shareholders, although occasionally harmful to new investors. One such opportunity is stock overvaluation. This type of market mispricing has largely been associated with two activities in the financial literature, namely seasoned equity offerings (SEOs) and stock swap acquisitions. The idea is that overpriced firms can create value for existing shareholders by either issuing their overvalued stocks or using them as currency in acquisitions of less overvalued targets. Potential gains can thus be achieved by managers recognizing and exploiting this short-term market timing opportunity. Consequently, the two activities are depicted as strategies for arbitrage exploitation accessible for firms in the presence of market mispricing.

Many research papers have scrutinized this notion of value creation subsequent to SEOs and stock swap acquisitions (e.g. Loughran and Ritter (1997) concerning SEOs and Fu, Lin and Officer (2013) concerning acquisitions). However, no direct comparison between the two activities has, to the best of our knowledge, been made in the light of share overvaluation. By providing this direct comparison, the aim of this study is twofold. First, we assess the difference in both long- and short-term value created by firms undertaking an SEO or a stock swap acquisition during a time window of stock overvaluation. This enables us to investigate the question of whether one action generates more value for existing shareholders than the other. Second, we examine factors affecting the choice between an SEO or an acquisition. In doing so, an explanation is provided as to why some firms choose one type of activity though it may seem inferior at first.

To start with, we control for both of our subsamples to include only overvalued issuers and acquirers at the time of the event by utilizing the technique derived by Rhodes-Kropf et. al (2005). The method of decomposing the log of market-to-book ratio allows us to assess the intrinsic (true) value of firms in question. This intrinsic value is then set in relation to the market value at the time of the activity, providing us with approximate subsamples of firms in the position to take advantage of their overvaluation.

After excluding non-overvalued firms, we assess the long- and short-term value created using SEOs or stock financed acquisitions. This is done by evaluating the difference in post-

event operating performance and the difference in announcement returns between the two types of firms in our sample. Our findings show a significant difference in the long-term operating performance between the two activities, with a change of 1.11% for acquiring firms and a negative change of -6.28% for the SEO-conducting firms. These findings indicate that synergies, although not substantial, are being created if firms opt for the stock swap acquisition alternative, while an inefficient use of offer proceeds deteriorates performances in issuing firms. The same story is portrayed by the difference in announcement returns subsequent to each event. Stock swap acquisitions were associated with a cumulative abnormal return of 0.568%, whereas SEOs exhibited a return of -3.50%. This suggests that, whilst a market correction of overvaluation occurs, investors' perception of stock swap acquisitions is positive and in line with the succeeding positive effect on long-term operating performance. Therefore, this mitigates the negative signaling effects of market mispricing that such acquisition announcements may infer. Most important, however, is that our results indicate a consistency between the long- and short-term value created by the two activities, advocating acquisitions as opposed to SEOs when firms are overvalued.

Taking this difference in value creation at face value implies that managers choosing the SEO alternative are making irrational decisions. However, by examining the probabilities of choosing the respective event given certain firm characteristics, we find that there are other potential explanations. Our findings suggest that firms with high near-term cash need have a higher propensity to conduct an SEO, while more mature firms tend to make a stock swap acquisition. This is consistent with the findings of DeAngelo et al. (2010) as well as Owen and Yawson (2010) and supports the expectations that mature firms have more established continuous cash flow, while younger firms at the growth stage tend to invest more and thus have a greater need of cash. By acknowledging the significant impact that such attributes have on the decision taken, we further contribute to previous research by providing a more nuanced view, relative to presenting a more binary decision process of whether to conduct a specific activity or not.

This paper proceeds as follows: Section 2 presents an overview of the relevant previous literature. In section 3, the dataset is discussed and in section 4 we present the empirical methodology used throughout the thesis. Section 5 presents the results we find, and section 6 concludes our findings. The thesis ends with section 7, describing the limitations of the study and suggestions for future research.

2. Previous Literature

2.1 Operating performance of M&As

While there are well documented empirical papers on cash and stock swap M&A-deals not necessarily motivated by exploitation of overvalued stock, the research on overvaluation-driven M&A-deals is more limited. The previous research is, however, not decisive of whether value is created following stock swap acquisition motivated by overvaluation. One of the most cited empirical papers regarding M&A-deals by overvalued acquirers is Shleifer and Vishnu (2003), who declare that acquirers with overvalued stock can create value for shareholders by using their stock as medium of payment to purchase less overvalued firms. Shleifer and Vishay assume inefficient markets in order to include a measure of stock overvaluation, which is not possible if assuming perfectly efficient markets. This is thus an assumption necessary to make also in our study.

A related study was made by Savor and Lu (2009), with the intention to test whether value can be created for long-term shareholders by engaging in stock swap acquisitions with overvalued stocks. They do this by comparing successful stock bidders with unsuccessful stock bidders that fail for exogenous reasons (i.e. not related to the acquirer's valuation). As opposed to Shleifer and Vashnie (2003), however, they assume that all stock swap M&A-deals are motivated by acquirer's overvalued stock, which ignores different possible motives for stock swap acquisitions. Their findings show that successful bidders outperform the unsuccessful ones, where performance is measured as the buy-and-hold abnormal returns. Savor and Lu therefore concludes that there is value inherent in succeeding as stock acquirers.

Following Savor and Lu (2009), significant research has been made to study the long-term performance of stock acquisition motivated by overvalued stock. One such empirical study is Fu, Lin and Officer (2013), where they attempt to assess whether a potential overpayment of acquisition targets still can create value by involving merger synergies. Their study shows that overvalued stock swap acquirers both overpay for their targets and experience deteriorated operating performance in the years following the acquisition, contrasting the conclusions made by Shleifer and Vishny (2003) and Savor and Lu (2009). The measure of overvaluation employed in the study is derived by Rhodes-Kropf, Robinson and Viswanathan (2005), a technique we also use in our study. Akbulut (2013) conducts a similar study, but uses a different approach to measure overvaluation, namely manager's insider trades. The findings of this study also demonstrate that shareholders of the acquiring firms are worse off, both in the short- and long-term.

As indicated by both Shleifer and Vishny (2003) and Fu, Lin and Officer (2013), another way to possibly create value for shareholders when stock is overvalued is by conducting an SEO. This is one area where we believe that our study can contribute. By presenting an additional alternative and directly comparing M&As and SEOs, we provide a greater understanding of the effects on operating performance in combination with previous research that studies the alternatives separately and examine whether they are to be undertaken or not.

2.2 Operating performance of SEOs

Much of the empirical work on SEOs already assumes overvalued stocks (often labeled as beneficial market timing) when SEOs are conducted, and other studies focus on the optimal market timing to issue equity. Loughran and Ritter (1997) intents to study the effect on operating performance of issuing firms post-SEO years. By using numerous different accounting measures, they find that the long-term operating performance decreases for the issuing firms. Their results are consistent with the findings of Hansen and Crutchley (1990), where a similar study is conducted for an earlier time period, and McLaughlin, Safieddine and Vasudevan (1996) for approximately the same time period.

Following these studies, more recent empirical work was made by Fu (2010), with findings that support the results of previous research of a decrease in operating performance in the years following the SEO. Fu also shows that this is mainly a result of overinvestment of SEO proceeds, reducing the asset turnover of issuing firms in the long run.

2.3 Announcement returns

The previous literature investigating market reactions subsequent to stock swap acquisitions is to some extent ambiguous. This can be demonstrated by the inconsistency that is apparent in findings presented by Healy, Palepu, and Ruback (1992) and those reported by Travlos (1987) and Loughran and Vijh (1997). Comparing stock swap acquisitions with other forms, for instance cash financed acquisitions, Healy, Palepu and Ruback (1992) found no relationship between the type of acquisitions and the abnormal stock returns subsequent to their announcement. Travlos (1987) reported, on the other hand, negative announcement returns following stock financed acquisitions and unaffected returns when acquisitions were cash financed. Heron and Lie (2002) investigate this inconsistency in the literature and report negative announcement returns that are congruent with the findings of Travlos (1987).

The literature studying market reactions subsequent to SEO announcements is, however, less ambiguous. As reported by Mikkelson and Partch (1986) and Asquith and Mullins

(1986), the common understanding is that such announcements infer significantly negative stock returns.

These negative market reactions subsequent to announcements of stock swap acquisitions and SEOs are consistent with implications made by Myers and Majluf (1984). In their pecking order theory, the authors relate such reactions to the asymmetric nature of financial markets. The reason is that these activities infer signaling effects that convey negative information about the value of the firm not extensively available to the market. However, comparing the literature on stock swap acquisition with that on SEOs, we notice a clear difference with regards to the magnitude of returns. This can, for instance, be observed the contrasting announcement returns reported by Asquith and Mullins (1986) on SEOs and Heron and Lie (2002) on M&As, where the returns subsequent to SEOs appear to be significantly more negative.

2.4 Firm characteristics affecting decision-making

Given the focus of this study, and its distinctiveness in attempting to objectively evaluate firm characteristics affecting the decision-making process of overvalued firms when opting for one of the two activities. We are subjected to literature examining the characteristics of firms conducting SEOs or M&As separately. This is because there exists no associated body of literature that directly compares the characteristics of such firms. Hence, our study contributes by providing this direct comparison between the characteristics of overvalued firms choosing SEOs or stock swap acquisitions.

2.4.1 SEO characteristics

When assessing the literature on characteristics of SEO-conducting firms, it becomes clear that market mispricing and share overvaluation are prominent factors. Ritter (1991) and Loughran and Ritter (1995) specify this regularity of high valuations in their window of opportunity framework. The notion here is that the managers will issue equity when their informational leverage about the value of the firm is high, i.e. in presence of share overvaluations. Consistent with this notion, market timing theories have been dominant in explaining firms undertaking an SEO (Baker and Wurgler, 2002; Brisker et al., 2014), making the most prevalent characteristic of such firms an ambiguous link to overvaluation.

DeAngelo et al. (2010) examine the prevalence of such market timing in secondary offerings. However, they also examine the effects that different stages of corporate life cycle and near-term cash need have on the probability of conducting an SEO. Their findings suggest

that, whilst timing opportunities and stages of corporate life cycle have statistically solid effects, the explanatory power of these two characteristics are modest. Contrary to previous literature, the authors conclude that the most prominent characteristic affecting the probability of an SEO is a near-term cash need.

2.4.2 M&A characteristics

The literature examining firm characteristics associated with mergers and acquisitions has, to a large extent, been dominated by studies focusing on targets rather than the acquirers. These studies have examined the characteristics of target firms in an attempt to assess the predictability of an acquisition (e.g., Palepu, 1986; Ambrose and Megginson, 1992; Espahbodi and Espahbodi, 2003). This is of importance, since defining such characteristics implies that trading strategies profiting from the high premiums paid to target shareholders can be formulated. The characteristics of acquiring firms have, nevertheless, been brought to light by Jensen (1986), who argued that there exists a strong relationship between firm size and the propensity to participate in acquisitions. The understanding was that managerial power and perquisites were highly linked to firm size, incentivizing growth through acquisitions beyond what is deemed optimal. A large body of literature examined the notion that characteristics such as size and age could have an effect on the probability of becoming an acquirer. One of such studies by Owen and Yawson (2010) investigates the relationship between M&As and different stages of corporate life cycle. Their findings prove to be consistent with Jensen (1986), concluding that older and more mature firms are more likely to conduct acquisitions than others.

2.5 Hypotheses

As presented in the previous sections, the literature suggest a clearly negative relationship between SEOs and subsequent announcement returns and long-term operating performance. However, this relationship is unclear with regards to stock swap acquisitions. In this case, inconsistences in conclusions surrounding the effects on announcement returns and operating performances provide a sense of ambiguity. Comparing the literature, it becomes apparent that an acquisition should be of preference to managers in overvalued firms. Since, even though not congruent with other studies, results by research showing negative effects subsequent to acquisitions still indicate higher performances compared to results on SEOs. Hence, or first hypothesis is that overvalued firms conducting SEOs will suffer from lower short-term announcement returns as well as lower long-term operating performances

compared to firms undertaking stock swap acquisitions.

Moreover, the positive relationship between certain firm characteristics and the two events suggests that these attributes can provide an explanation as to why some firms undertake a certain action even though it might seem inferior. The two characteristics most prominent in the literature are near-term cash need and corporate life cycle stage (defined here as years listed). Thus, our second hypothesis is that the level of near-term cash need and stage of corporate life cycle will have a significant effect on the type of activity conducted.

3. Data

The primary data sources used are the Securities Data Company (SDC) M&A and SEO database, COMPUSTAT and Center for Research in Security Prices (CRSP). Additionally, the industry classifications provided by the Kenneth French Data Library has been used.

3.1 M&A and SEO data

Extensive data on mergers and acquisitions, as well as seasoned equity offerings, is available in the SDC database, which were collected for during the period 1995-2017. This is extended by -5 years and +5 years relative to our main sample between 2000-2012, since we need to exclude firms conducting both an M&A and an SEO within a five-year window, in order to separate the effects of the action on the long-term performance. The data collected is filtrated to only include US acquirers or issuers, as well as only issues in US exchanges. The M&A targets can, however, be both US or foreign. Additionally, financial companies (SIC codes 6000-6999) and government institutions/organizations has been excluded for both events. The effective date and announcement date for the M&As, and the filing date and issue date for the SEOs, is also collected from SDC.

For the M&A observations, the acquirer must own less than 50% of the target company before the acquisition, and 100% after the transaction to include the full effects of the action on the long-term performance, consistent with extant studies such as Fu, Lin and Officer (2013). Other filters used for the M&A sample is to only include stock swap deals, public acquirers, completed transactions and a deal value of minimum $10 million dollars. It is not unusual for acquiring firms to conduct multiple M&As within the same fiscal year. Such firms have been excluded since that would result in the same accounting data being used multiple times in our calculation of the long-term performance, due to the accounting data being based on yearly observations.

Firms having conducted multiple SEOs within the same fiscal year are treated as one observation by aggregating the proceeds from the equity issues. This is consistent with the treatment used by DeAngelo et al. (2010). After these filtrations, without considering whether the firms are overvalued or not at the year of the event, we end up with a dataset of 2520 M&A-deals and 1312 SEOs.

3.2 Accounting and stock data

The M&A- and SEO-sample is subsequently merged with accounting data collected from COMPUSTAT. This data is mainly used to measure whether the firms are overvalued or not

at the year of the event, and thereafter to measure the operating performance of the firms both before and after the event. When calculating the industry median operating performance for each fiscal year, all firms with available accounting data in COMPUSTAT are collected and sorted according to Fama and French 12 industry definitions by SIC codes. When excluding non-overvalued firms, we end up with a dataset of 1253 M&A-deals and 786 SEOs.

Data on stock returns for the sample firms to calculate announcement returns of the respective events are collected from CRSP, as well as returns on the S&P 500 index used to calculate normal returns in the event study. All stock close prices collected are on a daily frequency. This data is merged with our final sample of overvalued M&A and SEO observations to calculate the respective announcement returns.

3.3 Data limitations

We acknowledge the fact that accounting data can be imperfect and subjected to manipulation by preparers. In the event of clearly inappropriate metrics or ratios, these observations are excluded from our sample. Such examples could be negative figures for book and market value of equity, book value of total assets and unreasonably high or low returns. Also, in the event of observations not having sufficient data for the announcement returns or operating performance surrounding the event day or event year, such observations are excluded.

By using filing dates from SDC as announcement dates for SEOs, we obtain an imperfect estimate of when the information reaches the market. However, this is consistent with the data used by Jegadeesh, Weinstein and Welch (1993), which compares their tests with announcement dates gathered from the Wall Street Journal Index and the Dow Jones News Service, with the same result as using the SEC filing dates. Being aware of its limitations, an extended event window is used to capture the actual announcement date for the SEOs.

4. Method

In the following section we present the methodology and empirical frameworks used to examine the long-term performance of firms conducting an M&A or SEO given pre-event overvalued stocks, and the methods used to explain the choice of the inferior action with selected firm characteristics. We begin by calculating whether the sample firms are overvalued or not, and if not, they are excluded from our sample. Secondly, the change in abnormal operating performance between the pre- and post-event years is calculated using ordinary least squares (OLS) regressions. This is consequently compared to the announcement returns for the respective event, using an event study. Finally, we employ logit regression models to examine whether firm characteristics, such as cash need and stage in corporate life cycle, provide explanatory value about the probability of conducting one activity instead of the other.

4.1 Measure of overvaluation

We employ the technique to measure overvaluation derived by Rhodes-Kropf, Robinson and Viswanathan (2005), which decompose the log market-to-book ratio of a firm into two components:

$$Ln\left(\frac{M}{B}\right) = Ln\left(\frac{M}{V}\right) + Ln\left(\frac{V}{B}\right)$$

where *M* is the market value of equity, *B* is the book value of equity and *V* is the intrinsic (true) value of equity, which is unobservable. The market-to-true value [Ln(M/V)] is the part of Ln(M/B) that captures misvaluation. Whenever the market value is different from the intrinsic value, the firm is misvalued. Ln(M/B) will be positive when the firm is overvalued, and negative when undervalued. Since *V* is unobservable, is has to be estimated. By using several different accounting metrics, Rhodes-Kropf, Robinson and Viswanathan (2005) assume that the intrinsic value of a firm is a linear function of its book value of equity, net income and leverage:

$$Ln(M_{it}) = \beta_{0jt} + \beta_{1jt}Ln(B_{it}) + \beta_{2jt}Ln(|NI_{it}|) + \beta_{3jt}I^{-}Ln(|NI_{it}|) + \beta_{4jt}\left(\frac{D}{M}\right)_{it} + \varepsilon_{it}$$

where B_{it} is the book value of equity for firm *i* at year *t*, $|NI_{it}|$ is the absolute value of net income for firm *i* at year *t* and $\left(\frac{D}{M}\right)_{it}$ is the market leverage ratio for firm *i* at year *t*, defined as

total debt divided by the market value of equity. I^- is a dummy variable that equals one for firms with negative net income for a given year and zero if net income is positive. Since the function is estimated with natural logarithms, this allows us to include all the firms with negative net income at a given year. The subscript j denotes industry and ε_{it} represents the market value of equity's deviation from the intrinsic value and is a proxy for misvaluation. Each component of the function is allowed to vary across firms and over time, as the fundamental accounting metrics change.

We run regressions annually for each industry between the years 2000-2012, to estimate the parameters β_{jt} using the Fama and French 12 industry definitions. However, Rhodes-Kropf, Robinson and Viswanathan (2005) also acknowledge that mispricing comprises of both firm-specific and industry-level deviations from intrinsic value. While the residual (ε_{it}) only include the firm-specific misvaluation at a given time, we include the industry-level component by taking the time series average of the estimated coefficients $\left(\hat{\beta}_{jt}\right)$ from the above function, $\bar{\beta}_j = 1/T \times \sum_t \hat{\beta}_{jt}$. Finally, the measure of misvaluation is specified as:

$$Ln\left(\frac{M}{V}\right)_{it} = Ln(M_{it}) - \left[\bar{\beta}_{0j} + \bar{\beta}_{1j}Ln(B_{it}) + \bar{\beta}_{2j}Ln(|NI_{it}|) + \bar{\beta}_{3j}I^{-}Ln(|NI_{it}|) + \bar{\beta}_{4j}\left(\frac{D}{M}\right)_{it}\right]$$

where the time series average industry coefficients are multiplied with firm and year specific accounting data to compute the effective mispricing, namely the aggregation of firm- and industry-level mispricing.

4.2 Operating performance

To test for the long-term performance of our sample firms, we employ the methodology suggested by Healy, Palepu and Ruback (1992) for the acquiring and issuing firms, respectively.

4.2.1 Performance measure

The primary measure of operating performance is earnings before interest, taxes, depreciation and amortization (EBITDA), divided by the market value of assets, defined as the sum of market value of common equity and debt net of cash. This measure is going forward called Operating ROA and operating performance interchangeably:

$$Operating\ ROA_t = \frac{EBITDA_t}{Assets_{t-1}}$$

where t denotes the fiscal year. Consequently, Operating ROA is calculated with the ingoing balance of the market value of assets, denoted with the subscript t-1. EBITDA is used since it is unaffected by the method of financing employed by the given firm, as well as depreciation and amortization, making the measure comparable cross-sectionally.

The operating performance for the acquiring and issuing firm is calculated for 3 fiscal years before, and 5 fiscal years after the event fiscal year (years -3 to +5), consistent with the timeframe employed by Fu, Lin and Officer (2013). The timeframe is chosen to reflect the long-term performance of the given firm after the event, since the effects resulting from the restructurings and integration of the firms in M&A-deals are not evident shortly after the event. Investments resulting from issue proceeds also has their main effects on the long-term performance of the given firm. The median operating performance for the acquiring and issuing firm, respectively, is subsequently calculated, both for the pre-event years (-3 to -1 years) and post-event years (+1 to +5 years)[1].

4.2.2 Abnormal performance

Operating performance can differ between industries, depending on type of business conducted and line items affected. Difference in operating performance between the pre- and post-event years can also be a result of industry wide and macroeconomic factors, e.g. a slow-down of the total economy or industry. In order to include this cross-sectional difference, we calculate the industry median operating performance for each fiscal year surrounding the event fiscal year (years -3 to +5). This is used as a performance benchmark. Hence, the abnormal industry-adjusted operating performance is calculated for each firm and fiscal year, by subtracting the industry median operating performance from the given firm's operating performance. To compute the abnormal changes in operating performance for the acquiring and issuing firms, we run cross-sectional OLS regressions:

$$OperatingPerformance_{post,i} = \beta_0 + \beta_1 OperatingPerformance_{pre,i} + \varepsilon_i$$

where $OperatingPerformance_{post,i}$ is the median abnormal operating performance for firm *i* for the post-event years (years +1 to +5), $OperatingPerformance_{pre,i}$ is the median

[1] The rationale for using the median and not the mean is to avoid year-specific erroneous or missing accounting data affecting the measure of operating performance, and thus bias our calculation.

abnormal operating performance for firm *i* for the pre-event years (years -3 to -1) and β_1 is the coefficient measuring the correlation in abnormal performance between the pre- and post-event years. The constant, β_0, measures the change in the abnormal operating performance for each firm as a result of the merger or SEO, making it the coefficient we are mainly interested in.

4.3 Event Study

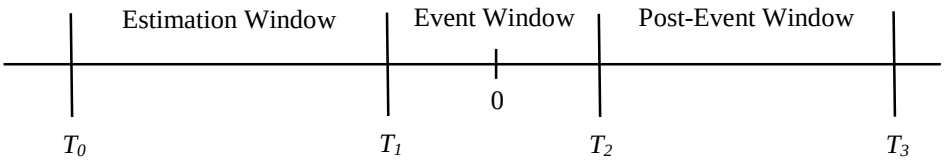
When measuring the impact of the M&As and SEOs on the respective firm's announcement returns, an event study is the fundamental method used. MacKinlay (1997) discusses the usefulness and applications of event studies, and this methodology is the empirical framework used for our tests.

4.3.1 Timeline

A prerequisite for conducting an event study is to identify the time period over which the stock prices of the acquiring and issuing firms will be analyzed, namely the event window. The event day of the M&A or SEO corresponds to the announcement date and filing date, respectively. We use an event window of 5 trading days prior to and 5 days after the event day, labeled "0" in Figure 1. This permits us to examine periods both before and after the event day, which is necessary in order to capture price effects occurring before the event if the market has received information about the event prior to the actual announcement, and also after the event if the information is received late by some investors on the subsequent days.

An estimation window is also necessary to estimate the normal returns of the respective firm's stock, which is to be compared with the actual return of the stock over the event window. We use a window for normal returns of 300 days prior to the event window, and consequently the 5 trading days prior to the announcement is not included to avoid an overlap between the estimation and event window.

Figure 1. Timeline for event study



4.3.2 The Market Model

Several different methods for estimating the normal returns of a firm's stock are suggested by MacKinlay (1997). One such model is the market model and is commonly used in the examples given in the same paper. This model is specified as:

$$E(r_{i,t}) = \alpha_i + \beta_i R_{mkt,t} + \varepsilon_i$$

where r_{it} is the stock return for security *i* at time *t*, R_{mkt} is the market return at time *t* and ε_i is the residual term. β_i measures the systematic risk of security *i* in relation to the market, and α_i is the deviation in return for security *i* from the market performance. Since our two samples consists of public US firms, the S&P 500 index is used as a proxy for the market return, consistent with suggestions presented by MacKinlay (1997).

To receive the abnormal returns, the estimated normal returns are contrasted to the returns during the event window. This is calculated as:

$$AR_{i,t} = R_{i,t} - [\hat{a}_i - \hat{\beta}_i R_{mkt,t}]$$

where $AR_{i,t}$ is the abnormal return for security *i* on day *t*. Whereas $\hat{a}_i$ and $\hat{\beta}_i$ are estimated coefficients for security *i* using the market model. In order to test for and draw conclusions about the event, the abnormal returns must be aggregated across observations:

$$\overline{AR}_t = \frac{1}{N} \sum_{T=T_1}^{T_2} AR_{i,t}$$

where $\overline{AR}_t$ is the average abnormal return for all sample firms at day *t* of the event window. These average abnormal returns are subsequently aggregated over the event window, to receive cumulative abnormal returns

$$\overline{CAR}(T_1, T_2) = \sum_{T=T_1}^{T_2} \overline{AR}_t$$

where $\overline{CAR}(T_1, T_2)$ is the cumulative average abnormal return for all sample firms at each day of the event window.

4.3.3 Tests for difference

Comparing our acquisition and SEO sample with each other requires testing for differences in abnormal returns, which is done by employing the Student's t-test. This test compares the means of the M&A and SEO sample, and tests for equality of the abnormal returns. The alternative hypothesis tested is that the difference in abnormal returns is different from zero. The variant used is the two-sample t-test when sample sizes are allowed to differ, but the variances are not assumed to be equal.

The Wilcoxon rank-sum test is also used to include the non-normality of the abnormal returns in the respective samples. The null hypothesis tested is that the abnormal returns of the two samples are equal, against the alternative that hypothesis that one sample have larger returns than the other.

4.4 Binary logit regression analysis

4.4.1 Dependent variable and probabilities

The binary logit regression analysis is used when assessing firm characteristics that may affect the decision between issuing new equity or conducting an acquisition. This method enables us to model a dichotomous outcome variable which, following our sample specifications, can be defined as conducting one of the two activities. More specifically, this variable will be anchored towards equity offerings. Thus, it takes on the value 1 when firms issue stock and 0 if acquisitions are made. This binary logit regression model can be specified as follows:

$$logit(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 = z_i$$

The probability that firm i undertakes an SEO in our sample is given by p_i. This probability can be mathematically calculated as:

$$p_i = \frac{1}{(1+e^{-z_i})}$$

4.4.2 Independent variables and firm characteristics

The two firm characteristics providing a basis for estimations of the probabilities in the logit model will be near-term cash need and stage of corporate life cycle. These will act as independent variables in our model and are based on proxies used by DeAngelo et al. (2010). Near-term cash need is defined as a firm's cash need one year after the event, had it not been

for the event. Hence, it takes into account the proceeds that may have been raised and subtracts them from the cash balance, giving us the pro forma cash balance. More specifically, it is calculated as the pro forma cash to assets ratio, and can be depicted as:

$$CashNeed = \frac{Cash - Offer\ Proceeds}{Total\ Assets}$$

The corporate lifecycle variable is, compared to the continuous cash need ratio, a categorial variable and is based on the amount of years a firm has been listed on a stock exchange. This variable takes on the value 1 if the firm has been listed for a maximum of five years, 2 if the years listed are between 6 - 10 years, 3 if between 11 - 15 years and 4 if it has been listed for more than 15 years. Incorporating these variables in our binary logit regression model gives it the following specification:

$$logit(p_i) = \ln\left(\frac{p_i}{1 - p_i}\right) = \beta_0 + \beta_1 LifeCycle + \beta_2 CashNeed = z_i$$

4.5 Robustness test

For our calculation of near-term cash need, it is possible that many of our sample firms used the offer proceeds to conduct investments that they would not have undertaken were it not for the proceeds, as highlighted by DeAngelo et al. (2010). This might indicate that the firm actually was not in need of the proceeds. Addressing this issue, we measure the cash need of the sample firms one year after the event by holding the capital expenditures fixed at the event year level, measured as the ratio of capital expenditures to assets. This ratio is subsequently used to calculate the capital expenditure of the sample firms the year after the event (year *t+1*, where *t* is the event year), and the reported capital expenditure for that year is added back to the cash balance. This mainly affects our SEO-sample.

In our sample, we have included observations of firms conducting more than one M&A-deal or SEO within a five-year window, while only excluding firms that have conducted both events within the same window. However, mainly affecting our M&A-sample, acquisitions might be a continuous growth strategy for many of our sample firms, providing small effects on operating performance and announcement return of an additional acquisition. Despite constraining our sample to a certain amount of deal value, we exclude firms conducting the same event (M&A or SEO) within a five-year window to address this concern, and thus only include firms where the event in question is a less common activity of the business operations.

5. Results

5.1 Long-term operating performance

Starting by looking at the change in operating performance, Table 1 shows that the estimate of operating ROA significantly decreases for firms choosing to conduct an SEO, with a change in operating performance of -6.28%, while we can see a small improvement in operating ROA following an M&A-deal by overvalued acquirers, with a corresponding change of 1.11%. This suggests that value is created for firms exploiting their overvalued stock by engaging in an acquisition, while the same is not true for firms deciding to issue equity. Although the increase in operating performance for M&A-deals is not substantial, in relative terms, the stock swap acquisition alternative appears to be a more value-creating alternative to make use of overvalued stocks than an SEO.

Table 1. Change in abnormal operating performance for M&As and SEOs.

This table presents changes in abnormal operating performance after an M&A-deal and SEO, respectively, by overvalued firms. The method used is based on Healy, Palepu and Ruback (1996). The median abnormal operating performance for the pre-event years (-3 to -1 years) and post-event years (+1 to +5 years) is calculated for each firm, where abnormal performance is defined as the firm's operating performance less the industry median operating performance in a given year, using Fama and French 12 industry definitions. We run a cross-sectional regression, with the median post-event operating performance as the dependent variable and the median pre-event operating performance as the independent variable. The reported number is the intercept from this regression and is interpreted as the change in abnormal operating performance of our M&A- and SEO-sample. The t-statistic from the regression output is presented in parentheses.

	M&A	**SEO**
Operating ROA	1.11%	– 6.28%
(t-statistic)	*(7.82)*	*(-13.56)*

These findings are consistent with the findings of Loughran and Ritter (1997) and Fu (2010) regarding deteriorated post-SEO operating performance, but deviates from the conclusions drawn by Fu, Lin and Officer (2013), as they find a negative change in operating performance following the M&A-deal. However, the measure of pre-event operating performance used in this study does not consider the potential combined performance of the acquiror and target in the pre-event years, which is done by Fu, Lin and Officer as they calculate the weighted average performance of the acquiror and target in the pre-event years. This can provide an explanation for the inconsistent result, as their measure is in part dependent on the pre-M&A performance of the M&A-target. What is in line with their results, however, is that the change in operating performance for overvalued acquirers is rather unsubstantial. Our results are thus

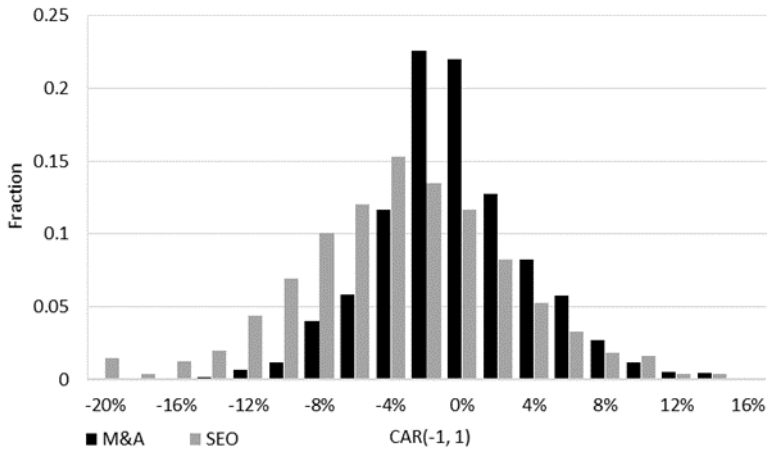
indicative of synergies being created for the acquiring firms when using overvalued stock as payment.

5.2 Announcement Returns

The distribution of announcement returns presented in Figure 1 provides a clear illustration of the differences in market reactions on announcements of seasoned equity offerings and stock swap acquisitions. We can see that he fractions of cumulative abnormal returns (CARs) are noticeably more evenly distributed and negative for SEO announcements. The majority of firms conducting an SEO experience returns between -3% and -8% CAR. However, there exists a large amount of such firms with announcement returns below -8% relative to firms undertaking an acquisition. The announcement returns on stock swap acquisitions are, on the other hand, more concentrated between 0% and -2% CAR. The differences in the distribution of returns, as well as magnitude of negative returns, subsequent these activities are consistent with the literature. This is clearly indicated in the contrasting results presented by Mikkelson and Partch (1986) and by Heron and Lie (2002) concerning market reactions on announcements of SEOs and M&As respectively.

Figure 2. Distribution of CARs for M&As and SEOs from day -1 to +1 relative to announcement day

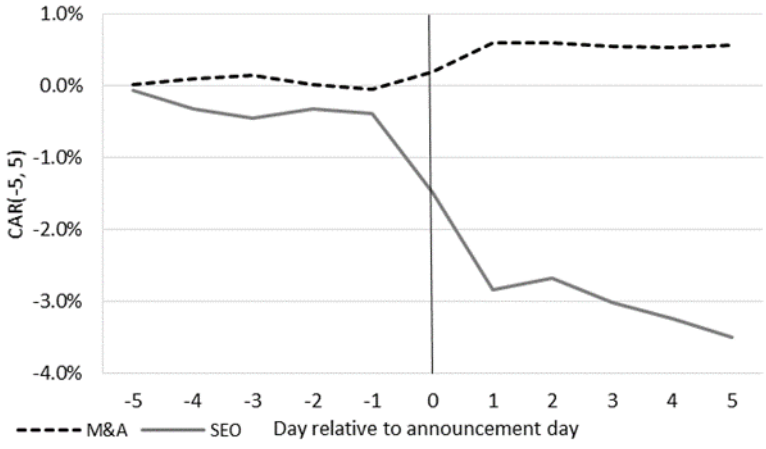
This graph shows the distribution of CARs for days -1 to +1 around the announcement day (day 0) of the respective event. The abnormal returns are calculated using the market model to estimate the normal market return for each firm, which is deducted from the firm's actual return in a given day to receive the abnormal return. Before calculating the average abnormal return, the returns are winsorized on the 5 percent level for each day. The y-axis shows the fraction of each level of CAR relative to the total sample for each respective event.



The CAR from an eleven-day event window surrounding the announcement day, presented in Figure 2, illustrates this contrast between announcement returns even further. It becomes clear that stock swap acquisitions are associated with a small but positive return on average. However, the complete opposite appears to be true this with regards to the announcement returns of SEO. The CARs following the announcements amounts to 0.568% and -3.50% for stock swap acquisition and SEO announcements respectively. This positive announcement return pertaining to acquisitions are inconsistent with previous studies such as Travlos (1987). Nonetheless, this anomaly sheds a light on the ambiguous nature of announcement returns subsequent to stock financed acquisition indicated by Healy, Palepu, and Ruback (1992). It may also be linked to the positive relationship that was found between acquisitions and the subsequent operating performance in our sample. SEO announcement returns are, on the other hand, less ambiguous. In this case, our findings are consistent with both the implications of the pecking order theory by Myers and Majluf (1984), and previous literature, such as Loughran and Ritter (1995), investigating the market reaction of such announcements. Moreover, since the market correction of overvaluation is more severe for SEOs than for stock swap acquisitions. Our results suggest that the signaling effects of overvaluation that SEOs convey to the market are interpreted much stronger than those of acquisitions.

Figure 3. Cumulative abnormal return for M&A- and SEO-firms day -5 to +5 relative to announcement day

This figure presents the cumulative average abnormal return for days -5 to +5 relative to the day of announcement (day 0) for M&As and SEOs. The abnormal returns are calculated using the market model to estimate the normal market return for each firm, which is deducted from the firm's actual return in a given day to receive the abnormal return. Before calculating the average abnormal return, the returns are winsorized on the 5 percent level for each day.



5.3 Consistency between operating performance and announcement returns

The consistencies between the results reported on SEOs and stock financed acquisitions provide a clear indication as to how the shareholders of overvalued firms are affected by each action. Higher value creation by stock swap acquisition holds true both in the long-run, with respect to operating performance, and short-run, specified by abnormal announcement returns. An objective interpretation would, thus, be that there should exist a noticeable preference towards this this type acquisitions by overvalued firms. Hence, this consistency verifies our first hypothesis that the long-term operating performance and the short-term announcement returns are lower for firms conducting SEOs compared to that of firms undertaking stock swap acquisitions.

5.4 Difference testing

To test whether the cumulative abnormal returns around the announcement date differ between announcements of SEOs and M&As, we perform two different tests, namely Student's T-test and the Wilcoxon rank-sum test. As shown in Table 5 in appendix, there is no significant difference between SEO and M&A returns in the period preceding the announcement date. Furthermore, both tests confirm the results shown in Figure 2, that there is a significant difference in the stock price reaction on the announcement day. The difference between SEO and M&A returns is also significant in the first days following the announcement of the respective event. Furthermore, the significant difference perceived by CAR(-10,10) and CAR(-30,30) is a result of including the announcement day in the interval. These results are consistent with expectations that the difference is significant when including the announcement day, and also the reaction afterwards as indicated by the days following the announcement day, although less significant before the announcement of the event has been made public for the market.

5.5 Firm characteristics and logit regressions

When doing the tests for our first hypothesis, no considerations has been taken related to the stage in corporate life cycle nor the different needs of our sample firms. Consequently, an evident way to provide explanations regarding why overvalued firms still choose to conduct the inferior choice is to consider differences in firm characteristics, in this study with focus on a firm's stage in its corporate life cycle and its cash need, respectively.

Table 2 shows that firms with a higher level of cash-to-assets have a smaller likelihood to conduct an SEO, and that more mature firms appear to be less likely to issue equity when

overvalued stock is apparent. As firm's become more mature, indicated by the number of years they have been listed, the likelihood of issuing equity decreases significantly, which seems to be consistent with a smaller short-term need for cash. This is shown by a decreasing likelihood to conduct an SEO when cash-to-assets is regressed in combination with years listed (-2.151), relative to when regressed as the only explanatory variable (-1.885). Furthermore, the relative effect of regressing years listed alone or together with cash-to-assets only provides a marginal effect.

Table 2. Logit regression to assess impact on probability to conduct SEO given a firm's cash need and number of years listed

This table presents the results from a logit regression with the intention to assess the effect a firm's cash need and number of years listed has on the probability to conduct an SEO. Cash need is defined as the reported cash balance divided by total asset for the year after the event, and for our SEO-sample the offer proceeds are deducted from the cash balance. The number of years a firm has been listed is divided in four groups, where the coefficients presented for the years listed variables should be interpreted as the change in the coefficient value in relation to the first group (years listed between 1-5 years). Three different logit regressions are presented, where the difference is how many of the independent variables are included. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

	All Variables	**Years listed alone**	**Cash-To-Assets alone**
Cash-To-Assets	-2.151***		-1.885***
	(0.237)		(0.228)
Years Listed (6-10)	-0.677***	-0.720***	
	(0.153)	(0.146)	
Years Listed (11-15)	-1.118***	-1.162***	
	(0.170)	(0.162)	
Years Listed (15+)	-2.079***	-1.954***	
	(0.137)	(0.132)	
McFadden's R-squared	0.151	0.102	0.042

We interpret these results as indicative of the expectations that more mature firms have had a longer time to establish a continuous cash flow, which decreases their near-term need for cash. A related interpretation of the observed result is that less mature firms, namely firms in their growth stage, have a higher propensity to invest in order to grow their business, resulting in a larger need of cash for younger firms and thus more prone to conduct an SEO. Our results therefore indicate that both a firm's near-term need for cash, and its maturity in terms of years listed, have explanatory value to why firms chooses to conduct an SEO when the results of our first hypothesis indicates that an acquisition is a superior choice. These findings are in line with the conclusions drawn by DeAngelo et al. (2010), both regarding the near-term cash need and lifecycle-stage of a firm, as having a significant impact on a firm's SEO-decision.

The positive relationship between a firm's maturity and likelihood of conducting an acquisition, the opposite interpretation of our logit regression results, are also consistent with relation found by Owen and Yawson (2010).

The predicted probabilities of the respective event are shown in Table 3, based on the coefficients from the logit regression when including all variables, providing a clear picture of the results in Table 2. It becomes evident that the probability of conducting an SEO is negatively related with the number of years a firm has been listed, while the reverse is true for firms choosing to do an acquisition. The effect seems to be the largest at the relatively younger stage of the lifecycle, as the change in probability for both events is most substantial between the two youngest groups.

Table 3. Change in probability of SEO and M&A as a function of number of years listed

This table shows the probabilities and change in probability of conducting an SEO or M&A-deal as firms become more mature, indicated by the number of years it has been listed. The probabilities are calculated from the estimated coefficients received from the following logit regression: $Logit(p_i) = \ln(p_i/1 - p_i) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 = z_i$, where the probability is calculated as $1/(1 + e^{-z_i})$. The coefficients used are from the logit regression when including all explanatory variables in the model. Four groups of years listed are shown, where the second group (6-10 years) shows the change in probability from being listed for 1-5 years. The rest of the probability changes are calculated relative to the group before.

	Years Listed			
	1-5	6-10	11-15	15+
SEO				
Probability	69.14%	47.42%	36.69%	21.30%
(Change in probability)		(-21.71%)	(-10.73%)	(-15.40%)
M&A				
Probability	39.69%	56.24%	67.23%	81.33%
(Change in probability)		(16.55%)	(10.99%)	(14.10%)

5.6 Effects of overvaluation

One factor that may give an explanation to why seasoned equity offerings infer stronger market reactions than stock swap acquisitions is the degree of overvaluation of such firms. The notion is that higher degrees of overvaluation will give rise to stronger market corrections of the overvalued stock, resulting in more negative announcement returns for SEO if this is the case. An assessment is, thus, made to examine the effects that such differences in overvaluation will have on the announcement returns of the two samples. However, to get an understanding of how firms undertaking SEOs and stock swap acquisitions differ in terms share overvaluation, we incorporate the findings from our overvaluation study into our most advanced logit model. The results in table 4 show a logit regression coefficient related the

degree of overvaluation equaling 0.264. Though not as substantial as the effects from firm characteristics, this coefficient implies that a higher level of overvaluation will increase the likelihood of firms conducting an SEO. This suggests that our sample of firms undertaking SEOs are more overvalued on average than the corresponding sample of firms conducting stock swap acquisitions.

In order to evaluate the effects that this difference might have on announcement returns, we hold the level of overvaluation in both our samples constant. This is done by excluding the least overvalued M&A firms and most overvalued SEO firms, leaving us with two smaller samples where the average level of firm overvaluation is merely the same. In figure 4 we can see that there is no significant change in the announcement returns when holding a constant level of overvaluation. The difference between the returns of SEOs and stock swap acquisitions are almost identical to when no such adjustment is made (Figure 3). Thus, indicating that the more negative market reactions subsequent to SEOs are not a consequence of higher levels of overvaluation. Instead, it appears that it is the nature of offering itself and the markets perception of the activity that gives rise to these negative reactions.

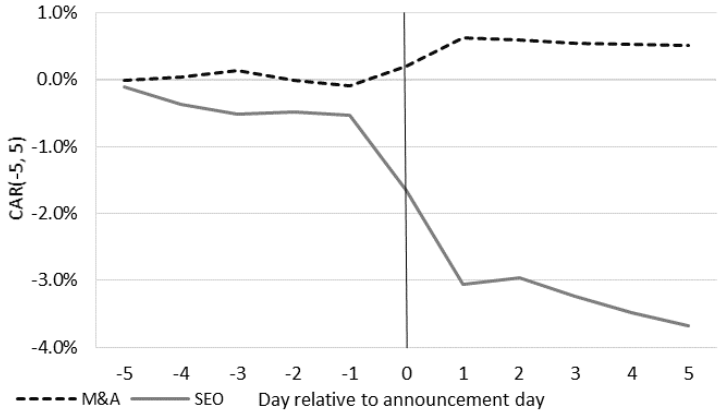
Table 4. Logit regression including variable for overvaluation

This table presents the same logit regression as when including all variables, as in Table 2, including the overvaluation variable. A firm's true value is unobservable and has to be estimated following the technique of Rhodes-Kropf, Robinson and Viswanathan (2005). First, a linear regression on a firm's market value is conducted with book value of equity, net income and leverage as explanatory variables, to estimate coefficients for each industry and year to capture the industry-wide misvaluation: $Ln(M_{it}) = \beta_{0jt} + \beta_{1jt}Ln(B_{it}) + \beta_{2jt}Ln(|NI_{it}|) + \beta_{3jt}I^{-}Ln(|NI_{it}|) + \beta_{4jt}\left(\frac{D}{M}\right)_{it} + \varepsilon_{it}$. The time-series average of the estimated coefficients is calculated and multiplied with the firm specific accounting metric for a given year. The true value of a firm is finally given by: $Ln\left(\frac{M}{V}\right)_{it} = Ln(M_{it}) - \left[\bar{\beta}_{0j} + \bar{\beta}_{1j}Ln(B_{it}) + \bar{\beta}_{2j}Ln(|NI_{it}|) + \bar{\beta}_{3j}I^{-}Ln(|NI_{it}|) + \bar{\beta}_{4j}\left(\frac{D}{M}\right)_{it}\right]$, and if the resulting value is above zero, the firm is overvalued and therefore included in our sample of SEOs or M&As.

Variables	SEO
Cash-To-Assets	-2.052***
	(0.231)
Years Listed (6-10)	-0.641***
	(0.156)
Years Listed (11-15)	-1.081***
	(0.172)
Years Listed (15+)	-1.978***
	(0.139)
Overvaluation	0.264***
	(0.071)
McFadden's R-squared	0.149

Figure 4. Cumulative abnormal return for M&A- and SEO-firms day -5 to +5 relative to announcement day, controlling for overvaluation

This figure presents the cumulative average abnormal return for days -5 to +5 relative to the day of announcement (day 0) for M&As and SEOs, when controlling for overvaluation. This is done by narrowing down the M&A- and SEO-sample to receive two equally overvalued samples on average. 7.98% and 7.38% of the M&A- and SEO-sample is dropped, respectively. Before calculating the average abnormal return, the returns are winsorized on the 5 percent level for each day.



5.7 Robustness

Even though we have confidence in the methods used as a means of reporting the aforementioned findings. Some question can be raised concerning how well certain ratios and samples reflect true nature of the events being tasted.

One of such questions relates our measure of near-term cash need that is used in our logit model. This ratio might not give a fair representation of firm's liquidity, since the propensity to invest one year after the event might increase as a consequence of the cash raised. In order to assess the robustness of our results, we address this concern by holding a constant capital expenditure to assets ratio at the event year level. This will consequently mitigate the effect of increasing investments that give an impression of a higher near-term cash need. However, we find no substantial difference in the results from the logit model presented in Table 2 and the logit model utilizing this adjusted ratio. The coefficient representing near-term cash need increased by a marginal amount from -2.151 (Table 2) to -2.074. This small change indicates that whilst this might be an issue, it surely does not discard the fact that near-term cash need has a significant effect on the probability of firms conducting an SEO. These results are consistent with the findings of DeAngelo et Al. (2010), who reports that a majority of firms conducting SEOs would still be the verge of bankruptcy even when adjusting for constant capital expenditures.

Another issue that can be raised pertains to the fact that the two samples being tested

include firms that have undertaken one of the two activities more than once in a five-year window. This may affect our results, as some firms might have SEOs or M&As as part of an underlying business strategy. Nevertheless, when assessing this issue by repeating our main tests on firms conducting an activity only once, we come to the same conclusions as before. No substantial differences were shown in the results related to the long-term operating performance following an event. The constant measuring the change in abnormal performance subsequent to SEOs changed from -6.27% to -5.45%. As for the corresponding change for Stock swap acquisitions was from 1.10% to 1.18%. Similar to this, the announcement returns changed from a CAR(-5;+5) of -3.50% to -3.91% for the SEO sample and from 0.568% to 0.965% for the M&A sample. Most importantly, the consistency between operating performance and announcement returns still holds when adjusting for this effect. Thus, further confirming our first hypothesis that stock swap acquisitions are superior.

The only noticeable difference appears in our logit test for firm characteristics. In this case, the coefficient representing near-term cash need decreased from -2.151 to -3.55. At the same time as the difference in the categorical coefficients relating to years listed decreased from -0.677 to -0.998 (years listed 6-10), from -1.118 to -1.471 (years listed 11-15), and increased from -2.079 to -1.703 (years listed above 15). This indicates that a near-term cash need has a higher effect on the probability of conducting an SEO when looking at firms only conducting either activity once. The opposite appears to be true for number of years listed.

6. Conclusions

This thesis examined long- and short-term value creation in overpriced firms subsequent to seasoned equity offerings and stock swap acquisitions. The two activities were assumed to be undertaken by virtue of exploitation, as the informational leverage of managers incentives such actions in times of market mispricing. In doing so, this direct comparison increases the understanding of optimal strategy by managers in overvalued firms. We find that there exists a significant difference between the value created following SEOs and stock financed acquisitions. Both long-run operating performances and short-term announcement returns prove to be in favor of acquisitions, as opposed to equity offerings. More specifically, the results indicated positive a change in long-term operating performance of 1.11% by firms undertaking stock swap acquisitions, whilst the corresponding change was -6.28% for SEO-conducting firms. The announcement returns subsequent to each activity displayed similar relations, with CAR amounting to 0.568% and -3.50% for acquiring and issuing firms respectively. This difference in announcement returns was virtually unaffected when controlling for the market's correction of overvalued stock, indicating that signaling effects of overvaluation by SEOs has a greater influence on announcements returns than the level of overvaluation itself.

An intuitive conclusion of these results would be that acquisitions should be of preference to managers in overvalued firms. However, looking at the characteristics of firms in our sample, we find that a near-term cash need had a significant effect on the probability of conducting an SEO. The amount of years listed, used as a proxy for the levels of corporate life cycle, had, on the contrary, a positive effect on the probability of undertaking stock swap acquisitions. This suggests that, since mature firms have been operating for a longer time, they have a more developed establishment of continuous cash flows, reducing their immediate cash need and thus the attractiveness of an SEO. On the other hand, growing young firms tend to invest more, and in combination with a less established flow of recurring cash, their near-term cash need makes the SEO alternative more appealing for them.

7. Limitations and future research

During the process of collecting the observations needed for our M&A- and SEO-sample, no attempt to match the samples based on comparable characteristics has been made. This is partly since our second hypothesis tests for how differences in specific firm characteristics between the two samples can explain the probability of choosing one alternative over the other. Our results therefore provide support for the difficulty of finding proper comparable firms, which would need not only to be overvalued, but also choosing an M&A-deal instead of an SEO or vice versa. However, as emphasized by Barber and Lyon (1996), not using comparable firms in estimating the abnormal performance of firms following corporate events can be problematic. This is partly addressed by using a yearly industry median as benchmark performance, instead of using a control firm as benchmark in the alternative method of comparable samples.

When measuring the cash need of our sample firms, the offer proceeds are deducted from the ratio used for the SEO-sample, in order to get a measure of the cash balance were it not for the equity issue. We acknowledge the limitation it presents for our M&A-sample, as these firms will not have any offer proceeds per definition. This is partly the reason we perform the robustness test, where we hold the ratio of capital expenditures to assets in the pre-event year constant to assume normal business operations.

Our measure of overvaluation is based on regressions to receive the unobservable intrinsic (true) value of a firm in a given time. Of course, this measure of assessing a firm's true value is imperfect, as it otherwise would be possible to always be certain of a firm's correct value and subsequently gain on stock trading using this method. Consequently, we employ a technique that attempts to come as close as possible in establishing the true value of a firm, and may therefore contain small errors.

To provide further guidelines for managers regarding which method to choose, we suggest for future research to look at how the different use of the offer proceeds affect the long-term operating performance for the SEO-firms. As the results of this study finds a negative operating performance, it might not be the case for all usages of the offer proceeds, where some spending's can prove to be relatively better than other. A related suggestion can be made for the M&A-firms, where targets in the same industry can presumably provide more synergies than targets outside the home industry of the acquirer. Thus, the small improvement in operating performance for stock swap acquirers might be larger if the target acquired is competing in the same industry.

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Appendix

Table 5. Tests for significance between M&As and SEOs in CAR during different periods.

This table shows if the stock price reactions in the M&A and SEO sample significantly differ during different time periods around the announcement date of the respective event, using two different tests (Student's T-test and Wilcoxon rank-sum test). The number of observations, mean values and standard deviation for both M&As and SEOs are presented. For the t-tests, two-sided p-values as well as the standard error and t-statistic is included. The t-test allows sample sizes to differ and assume unequal variances. For the rank-sum test the z-statistic and p-value is presented. The cumulative abnormal returns are winsorized at the five percent level.

							Student's T-test			**Wilcoxon rank-sum test**	
CAR-interval	Obs. (M&A)	Obs. (SEO)	Mean (M&A)	Mean (SEO)	Std. Dev (M&A)	Std. Dev (SEO)	Two-sided p-value	Std. Error	T-statistic	P-value	Z-statistic
CAR(-30,-1)	1155	554	0.13%	-0.23%	9.38%	20.26%	0.693	0.90%	0.395	0.759	-0.307
CAR(-10,-1)	1155	554	0.11%	-0.42%	5.52%	10.38%	0.263	0.47%	1.119	0.175	1.356
CAR(-5,-1)	1155	552	-0.05%	-0.38%	3.88%	6.79%	0.293	0.31%	1.051	0.118	1.565
CAR(-3,-1)	1155	552	-0.14%	-0.06%	2.95%	5.14%	0.727	0.24%	-0.348	0.620	0.496
CAR(-2,-1)	1155	552	-0.20%	0.06%	2.37%	4.31%	0.181	0.20%	-1.338	0.342	-0.950
CAR(-1,1)	1155	552	0.58%	-2.51%	4.25%	5.99%	0.000***	0.28%	10.883	0.000***	11.333
CAR(1,2)	1155	552	0.39%	-1.18%	3.49%	4.70%	0.000***	0.22%	7.005	0.000***	6.642
CAR(1,3)	1155	552	0.35%	-1.52%	3.82%	5.59%	0.000***	0.26%	7.073	0.000***	7.174
CAR(-5,5)	1155	552	0.56%	-3.48%	6.74%	10.91%	0.000***	0.51%	8.007	0.000***	8.363
CAR(-8,8)	1155	552	0.57%	-3.94%	7.36%	12.78%	0.000***	0.59%	7.704	0.000***	7.982
CAR(-10,10)	1155	554	0.47%	-4.91%	8.95%	15.93%	0.000***	0.73%	7.409	0.000***	8.107
CAR(-30,30)	1155	554	0.24%	-9.55%	15.70%	33.55%	0.000***	1.50%	6.528	0.000***	6.578

Table 6. Median operating performance (operating ROA) per year and industry.

This table shows the median operating performance for each industry and year used to calculate the abnormal operating performance for each year of our sample firms, where Fama and French 12 industry definitions are used. The abnormal operating performance is defined as the operating performance of the sample firm, less the industry median operating performance for the same year. The medians are calculated using data on all available US-firms in the Compustat database for the years of interest.

	Industry Medians											
Year	Consumer Nondurables	Consumer Durables	Manufacturing	Energy	Chemicals	Business Equipment	Telecom & TV	Utilities	Shops, Retail	Healthcare, Medical	Money, Finance	Other
1997	34.55%	45.60%	46.70%	58.45%	55.91%	41.00%	31.35%	36.22%	34.56%	33.90%	18.36%	32.18%
1998	28.05%	44.32%	35.37%	21.27%	38.57%	-3.72%	23.26%	34.97%	27.34%	31.09%	10.54%	25.07%
1999	12.36%	15.66%	13.35%	12.69%	10.88%	5.51%	6.06%	14.92%	12.66%	-1.04%	9.27%	10.53%
2000	12.57%	13.86%	14.04%	19.85%	10.81%	0.45%	2.45%	20.26%	13.66%	-1.80%	9.14%	9.39%
2001	12.96%	10.93%	11.78%	14.78%	8.30%	-0.99%	4.10%	18.41%	13.11%	-3.35%	8.49%	8.63%
2002	12.20%	12.43%	10.99%	9.93%	10.09%	0.67%	5.70%	18.34%	13.21%	-2.73%	8.46%	8.52%
2003	12.92%	11.74%	11.61%	14.29%	10.42%	6.21%	9.29%	20.33%	15.15%	-0.81%	8.47%	10.30%
2004	11.51%	11.04%	11.79%	12.11%	10.76%	3.71%	7.02%	20.19%	13.57%	-1.09%	7.81%	8.60%
2005	10.87%	9.43%	11.15%	13.46%	10.31%	4.68%	7.60%	20.87%	11.85%	-3.17%	7.84%	8.30%
2006	10.45%	10.17%	12.06%	12.52%	11.12%	4.00%	9.34%	18.71%	11.43%	-4.60%	7.84%	8.16%
2007	9.89%	9.73%	11.47%	13.26%	10.26%	5.01%	8.24%	19.79%	10.48%	-5.75%	7.27%	7.65%
2008	9.60%	8.97%	10.43%	9.12%	9.29%	5.06%	10.35%	16.59%	10.64%	-2.46%	5.36%	6.90%
2009	14.40%	9.44%	10.94%	8.56%	11.59%	8.89%	15.31%	18.87%	15.23%	-0.55%	5.97%	9.59%
2010	14.03%	12.68%	12.89%	11.32%	14.22%	9.26%	15.24%	18.31%	14.46%	-3.06%	8.03%	10.19%
2011	11.69%	12.15%	12.80%	13.17%	12.37%	7.37%	13.99%	18.59%	13.72%	-3.91%	9.63%	9.65%
2012	11.83%	13.42%	13.61%	10.10%	12.03%	6.81%	14.84%	17.37%	13.81%	-4.36%	11.23%	10.34%
2013	10.38%	11.06%	11.95%	8.96%	11.15%	6.11%	13.29%	17.81%	11.67%	-6.30%	10.43%	9.92%
2014	8.17%	9.42%	9.73%	8.94%	8.85%	4.59%	10.53%	17.47%	9.91%	-7.27%	9.79%	8.27%
2015	8.42%	8.81%	9.31%	-2.81%	8.26%	4.11%	10.63%	19.24%	9.33%	-8.41%	9.43%	7.90%
2016	8.11%	9.84%	10.31%	1.97%	9.33%	4.92%	11.68%	19.37%	9.80%	-9.78%	9.08%	8.64%
2017	8.61%	9.20%	9.38%	8.37%	8.69%	5.04%	11.01%	20.00%	8.80%	-11.59%	8.54%	8.69%