Expected Firm Performance and IPO Price Formation

by

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Abstract

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This study examines how accounting information influences investors' evaluations of IPO firms. Specifically, I examine whether a simple financial statement analysis process that provides information about the future prospects of IPO firms is useful in explaining the investor feedback that issuing firms receive *during* the bookbuilding portion of the IPO process. I find that this information about an IPO firm's prospects is not fully captured in the price that the underwriter proposes for the offering and that investors use the bookbuilding process to adjust the proposed price to more fully reflect this information. I also show that investors' use of this accounting information improves the accuracy of IPO pricing. Finally, I show that this information is more likely to be fully impounded into the final offer price when there is greater participation from institutional investors in the bookbuilding process. These findings highlight the value that investors associate with an IPO firm's accounting information and reveal that the price revision is much more predictable than suggested by the extant literature.

CHAPTER 1

Introduction

An initial public offering (IPO) is one of the most important events in a public firm's life cycle. Despite this importance, Wysocki (2007) notes that "the accounting literature on this topic remains in its infancy."[1] The goal of this paper is to further our understanding about how accounting information influences investors' evaluations of IPO firms. Specifically, I use a simple financial statement analysis process to examine whether an accounting-based signal about the future prospects of IPO firms is useful in explaining the price revision that occurs *during* the bookbuilding portion of the IPO process. By focusing on the price revision, rather than the final offer price, I am able to isolate the investor feedback received during IPO price formation and identify how accounting information influences that feedback.

Understanding the price revision is important for several reasons. First, the price revision directly impacts a firm's cost of equity capital. Because issuing firms anchor on the midpoint of the proposed pricing range (Loughran and Ritter, 2002), the price revision represents the difference between the issuing firm's expected cost of equity capital and its actual cost of equity capital. Second, an underwriter's credibility depends on its equity marketing history (Chemmanur and Fulghieri, 1994). Thus, the price

[1] Similarly, Charles Lee (2001) notes that IPOs are a topic that has "traditionally been the domain of corporate finance or investments, even though accounting information plays an important role in [this] decision context."

revision directly influences an underwriter's reputational capital.[2] Third, Ritter (2011) identifies the price revision as the single variable with the greatest explanatory power of firms' initial returns. Accordingly, a greater understanding of the price revision is likely to yield a better understanding of this heavily researched topic (Ritter and Welch 2002).

I expect that a firm's future prospects, as signaled by its accounting information, will influence the price revision due to the incentives that are inherent when firms issue equity. Specifically, issuing firms have a strong incentive to maximize the proceeds they receive in exchange for their shares. Aware of this, underwriters vying to be selected to lead a potential IPO firm's offering may attempt to increase the probability of being selected to lead the offering by proposing a valuation suggesting that the firm has abnormally strong growth prospects. While some IPO firms may indeed have future prospects that justify a high valuation, the competitive underwriter selection process likely leads many IPO firms to be marketed as having future prospects that exceed their actual prospects. Consistent with this conjecture, the majority of firms that go public either price below the midpoint of the underwriter's proposed pricing range or elect to withdraw their offering during the registration process.[3]

If each firm comes to market with a proposed price reflecting strong future performance then the information that investors use to determine these firms' actual

[2] While theory has assumed this relationship when constructing models of underwriter reputation, no prior empirical evidence exists to support this statement. Accordingly, I examine this relationship empirically as one of the additional analyses included in Chapter 6 of this paper. Consistent with the assumed relationship, I show that an underwriter's future market share is increasing in the average price revision of the firms that the underwriter has historically brought to market.

[3] Specifically, approximately 60% of the firms in my sample (IPOs from 2001 – 2007) either withdrew an offering or priced below the midpoint of the proposed pricing range. Similar distributions have also been observed for earlier time periods (Lowry and Schwert, 2004). Refer to Appendix B for additional commentary regarding the competitive nature of the underwriter selection process.

future prospects should be useful in predicting the price revision. That is, a firm that presents investors with information that corroborates the firm's strong future prospects is more likely to maintain its proposed valuation than is a firm without supporting information. Consistent with investors using a firm's accounting information to determine these firms' future prospects, I find that an accounting-based signal about an IPO firm's future prospects is positively associated with the investor feedback that issuing firms receive during the bookbuilding portion of the IPO process. I also show that investors' reliance on this accounting information improves the accuracy of IPO pricing. Finally, I show that this information is more likely to be fully impounded into the final offer price when there is greater participation from institutional investors in the bookbuilding process. These findings highlight the value that investors associate with an IPO firm's accounting information and reveal that the price revision is much more predictable than suggested by the extant literature.

To perform my tests, I rely on the fundamental analysis literature to guide my selection of detailed financial statement information that has been shown to provide useful information about a firm's future performance (Ou and Penman, 1989; Lev and Thiagarajan, 1993; Abarbanell and Bushee, 1997). I then use a simple financial statement analysis process to construct a measure (*Performance*) that sorts the cross-section of IPO firms into groups based on their expected future performance (e.g., Piotroski, 2000; Wahlen and Wieland, 2011).[4] Importantly, the information required to construct this

[4] Specifically, Performance is a composite score comprised of the following six fundamental signals: Δ PP&E, Δ Leverage, Δ CFO, Δ EBIT, Δ Asset Turnover, and Δ GM. While prior research has found each of these signals to be useful in predicting a firm's future performance, there is no look-ahead bias in my study since I examine the price changes that occur during IPO price formation. Refer to Section 3.2.1 for additional information about this measure.

measure is available to investors prior to the beginning of the bookbuilding period. However, for research purposes, Compustat only provides this information for the subset of firms that successfully complete an offering. To avoid the selection bias concerns associated with excluding the investor feedback for the firms that withdrew an offering during the registration period, I manually gather their information directly from their registration statements. This provides me with a data set that is able to address my question of interest without conditioning my findings to the subset of successful offerings. It also provides a rare, detailed examination of the characteristics of firms that elect to withdraw their IPOs during the registration process.[5]

I begin my empirical analysis by examining whether *Performance* helps explain the cross-sectional variation in the investor feedback received during the bookbuilding process. I identify a positive, nearly monotonic relationship between the values of *Performance* and the investor feedback. This positive association is robust to the inclusion of controls for market conditions, firm characteristics, the terms of the offering, and both year and underwriter fixed effects. This result is also economically meaningful as a one standard deviation increase in *Performance* is associated with a 4.6 percent increase in the probability that the firm successfully completes its offering and a 5.1 percent increase in the price revision for the successfully completed offerings. These results are consistent with my main prediction and provide evidence that investors

[5] The percentage of firms that begin the IPO process and elect to withdraw their offering has historically been between 20-25 percent (Hao, 2011). While the costs associated with manually gathering the information for this group of firms has generally resulted in their exclusion from empirical research, Busaba et al. (2001) provide evidence that these firms are similar in size and profitability to those firms that successfully complete an offering. Further, he finds that these firms also engage underwriters that are equally as reputable as those facilitating successful offerings.

attach more value-relevance to this publicly available accounting information than is reflected in the underwriter's proposed valuation.

To reinforce my finding that an IPO firm's accounting information is influencing the investor feedback received during the bookbuilding process, I examine a cross-sectional setting in which the quality of the accounting-based signal is likely to be either higher or lower. Specifically, I expect that the investor feedback will be less sensitive to the *Performance* variable for the most R&D-intensive IPO firms. I expect this relationship because the high level of uncertainty surrounding the future benefits of R&D investment reduces the predictive value of a firm's accounting information (Lev and Sougiannis, 1996; Kothari et al., 2002). Thus, investors are likely to look to information sources other than an R&D-intensive firm's accounting information to project its future prospects. Consistent with this prediction, I find that *Performance* is less predictive of the investor feedback received for the more R&D-intensive group of firms. This finding provides additional support for my main prediction by showing that investor feedback is differentially impacted by IPO firms' accounting information based on its quality.

While my prior results suggest that investors use an issuer's accounting information to adjust the underwriter's proposed price, they do not speak to whether or not investors used this information correctly. To this point, an IPO firm's long-term value may be accurately reflected by the proposed price but investors adjust it because they are unable to verify the private information included therein. Under this information-based theory, the IPO firm's price would be expected to revert back to the proposed price as investors learn additional information about the firm's value *after* the offering is priced. Contrary to this theory, I identify a positive, nearly monotonic relationship

between *Performance* and the abnormal stock returns earned by IPO firms when they begin trading on the secondary market. However, I also find that this result is reduced when institutional investors are more involved in the bookbuilding process. These findings suggest that investors' increased reliance on this accounting information improved the accuracy of IPO pricing and that sophisticated investors are more likely to extract the full value relevance of this information during the bookbuilding process.

This study makes several contributions. First, I exploit a powerful setting to highlight the value that investors associate with an IPO firm's accounting information. While prior studies frequently suggest that an IPO firm's accounting information is either ignored by investors (Shiller, 1990) or that it is of limited use for valuation purposes (Ritter, 1998; Kim and Ritter, 1999), my results indicate that accounting plays a significant role in investors' evaluations of IPO firms.

Second, I show that the price revision is much more predictable than is suggested by prior research. Specifically, I show that a firm's expected future performance, as indicated by its historical accounting information, is positively associated with the price revision. This finding combines with Lowry and Schwert (2004) to caution future research against using the underwriter's proposed price as an unbiased predictor of the final offer price.

Third, I extend the fundamental analysis literature by documenting the signaling role of accounting information for growth firms. While prior literature questions whether a firm's fundamental signals are useful for projecting a growth firm's future prospects (Piotroski, 2000), my findings reveal that this information is positively associated with the secondary market abnormal returns of IPO firms.

Finally, included in my additional analyses, I provide the first empirical evidence that underwriters incur reputational damage for marketing overpriced offerings. Specifically, I show that an underwriter's future market share is increasing in the average price revision of the firms that the underwriter has brought to market. This finding provides support to prior theory that assumes this relationship (e.g., Chemmanur and Fulghieri, 1994) and cautions underwriters from engaging in competitive bidding during the underwriter selection process.

The paper proceeds as follows. Chapter 2 provides information about the IPO setting and discusses the motivation for my study. Chapter 3 describes the data used in my study. Chapter 4 discusses the empirical results. Chapter 5 documents robustness tests for my empirical results. Chapter 6 provides additional analyses, and Chapter 7 concludes.

CHAPTER 2

Background and Hypothesis Development

2.1 Background and Research Design

Several prior studies examine whether accounting information is useful for valuing IPO firms. A recurring theme in this literature is that trading strategies which are based on accounting information at the time of the IPO earn abnormal returns subsequent to the initial offering (Peristiani and Hong, 2004; Purnanandam and Swaminathan, 2004; Demers and Joos, 2007; Bhattacharya et al., 2010; Gao et al., 2012). This persistent finding, aided by frequent media commentary,[6] has raised questions about whether the investors involved in the bookbuilding process are ignoring the accounting information of IPO firms when making their investment decisions.

One reason that investors may ignore an issuer's accounting information is because underwriters propose a suggested price for the offering at the beginning of the bookbuilding process. Rather than incurring their own costs to gather and process an IPO firm's information (Merton, 1987), investors may choose to simply rely on the underwriter's proposed price (Grossman, 1976). Consistent with this possibility, Shiller (1990) presents survey evidence that only a small minority of IPO investors performed

[6] For example, following Facebook's IPO, Aswath Damodaran wrote a guest post for Forbes noting that "Much as I would like to believe that the pricing of Facebook's IPO was based upon an assessment of the fundamentals, I am a realist. Much of what passes for valuation on Wall Street and corporate boardrooms is not valuation, but pricing (Damodaran, 2012)." Similar articles are easily found for Groupon, Zynga, Twitter, and many other IPOs.

any calculation of a share's fundamental value and compared it to the underwriter's proposed price. Rather, these repeat investors reported that their investment decisions were primarily determined by the underwriter's recommendation.

The underwriter's role in the IPO process has impeded researchers' ability to identify how investors use an IPO firm's accounting information in their investment decisions. While some studies find accounting information to be value-relevant for IPO firms (Bhabra and Pettway, 2003; Aggarwal et al., 2009), a value-relevance research design is unable to disentangle whether investors are using the firm's accounting information or simply relying on the underwriter's proposed valuation (Shiller, 1990). To overcome this limitation, and examine how a firm's accounting information influences investors' investment decisions, I examine the investor feedback provided to underwriters *after* they have proposed a valuation for the offering. This research design allows me to examine how investors use accounting information to evaluate IPO firms *without* the endogeneity concerns introduced by the underwriter's involvement in the IPO process.

2.2 Setting: The IPO Process

The vast majority of IPOs are priced using the bookbuilding mechanism (Wilhelm, 2005; Jagannathan and Sherman, 2006). To better understand the role of bookbuilding and the investor feedback provided during this process, it is useful to consider the bilateral information asymmetry that exists when firms go public. Specifically, investors generally have very little information about an IPO firm prior to its offering, while the IPO firm knows neither the investors who may be interested in the offering nor their level of interest (Draho, 2004). To reduce this bilateral information asymmetry, an IPO

firm files a registration statement with the SEC providing extensive information about the firm (Leone, et al., 2007; Loughran and McDonald, 2013). In the event that an IPO firm learns new information during the registration period that may reasonably impact its valuation, it has a legal responsibility to communicate this new information to investors by amending its registration statement. This process, required by the Securities Act of 1933, is designed to produce a single document about the IPO firm which investors can use to make an informed investment decision.

Having provided this information to investors, the underwriter proposes a price for the offering and begins to market it through the bookbuilding process. During this process, underwriters solicit non-binding indications of interest from potential investors. The underwriter then uses this information to understand the actual demand for the offering and sets the final offer price accordingly. While the registration statement includes a proposed pricing range for the offering, the final offer price frequently varies both within and outside of this range. This price change, measured from the midpoint of the proposed pricing range to the final offer price, is referred to as the price revision. The price revision is extremely important to a firm since it captures the difference between the firm's expected and actual cost of equity capital.

INSERT FIGURE 1

While the underwriter uses investors' indications of interest to set the final price (Cornelli and Goldreich, 2001, 2003), this price may not reflect investors' actual level of demand. This is because investors will only reveal that their valuation is in excess of the proposed price if the underwriter agrees to only partially impound this information into

the final offer price (Benveniste and Spindt, 1989). By only partially impounding the positive information received during the bookbuilding process, the underwriter can then use its allocation discretion to reward the investors that revealed the positive information with underpriced shares (Aggarwal et al., 2002). On the other hand, if investors' valuations are lower than the underwriter's proposed price then this negative information must be fully impounded into the final price in order to clear the market. Thus, the firm's stock returns from its first day of trading on the secondary market must also be considered when attempting to quantify the full extent of the mispricing (Hanley, 1993).

2.3 Motivation

Issuing firms provide extensive information in the registration statement to potential investors. However, these investors remain at a significant information disadvantage relative to the issuing firms. To overcome this information problem, issuing firms contract with an underwriter that can use its reputational capital to enhance the offering's credibility (Leland and Pyle, 1977; Booth and Smith, 1986). In this role of financial intermediary, underwriters face conflicting pressures to both minimize an IPO firm's cost of capital *and* to provide investors with attractive investment opportunities (Beatty and Ritter, 1986). Given these conflicting pressures, the analytical models that underlie the IPO literature assume that the prices proposed by underwriters will be reflect all of the information known to the underwriter about the value of issuing firms (Rock, 1986; Benveniste and Spindt, 1989). This assumption implies that the price revision is exclusively related to new information learned by the underwriter during the bookbuilding process

Based on these analytical models, the limited empirical research that examines the price revision has generally focused on how the arrival of new information *during* the bookbuilding period (e.g., changes in macroeconomic conditions) influences the price revision. While these studies find that the price revision is sensitive to changes in macroeconomic conditions during the bookbuilding period (Lowry and Schwert, 2004; Ince, 2008), they are unable to explain the quantitative magnitude of the price revision that is observed in the U.S. market. Accordingly, Ritter (2011) concludes that the information-based theories that underlie the IPO literature are "at best of second order importance" and admonishes future research to more fully consider the quality of the underwriter's proposed price.

One reason that the quality of an underwriter's proposed price may be compromised is because an IPO firm has a strong incentive to minimize its cost of capital. Given this incentive, an underwriter that is pessimistic about a firm's future prospects is unlikely to be selected to lead that firm's offering. Aware of this, potential underwriters competing to be selected to lead a firm's offering may attempt to increase the probability of being selected by only proposing valuations that reflect issuing firms as having abnormally strong future prospects.[7] While some IPO firms may indeed have future prospects that justify such a valuation, the competitive underwriter selection process likely leads many IPO firms to be marketed as having future prospects that exceed their actual prospects.[8]

[7] Refer to Appendix B for additional commentary regarding underwriter behavior during the underwriter selection process.

[8] Note that this process is likely to result in a winner's curse (Thaler, 1988). However, underwriters don't incur the financial repercussions associated with this overbidding since they are able to adjust the price after the bookbuilding process to reflect the market's actual level of demand. This is one of the primary reasons that

This potential misvaluation provides investors with a financial incentive to gather information about the values of IPO firms (Grossman, 1976; Kothari, 2001). As part of this process, I expect investors to use the accounting information of IPO firms to obtain a more objective indicator about these firms' future prospects, which they can then use to revise the proposed prices. While prior research questions whether a growth firm's accounting information is capable of providing a reliable signal about that firm's future prospects (Ritter, 1998; Piotroski, 2000), an IPO firm's accounting information is generally viewed as the most accurate and detailed information available to investors about the IPO firm's operations. Accordingly, I expect issuing firms whose accounting information corroborates the strong future prospects reflected in their proposed valuations to be more likely to maintain that valuation relative to those firms that do not have the supporting accounting information and make the following prediction:

> ***Prediction 1****: The investor feedback received during the bookbuilding period is increasing in an IPO firm's expected future performance, as indicated by its fundamental signals.*

Prediction 1 is based on the premise that the majority of IPO firms are marketed as having strong future prospects to investors and that investors use these firms' accounting information to determine whether these claims are accurate.[9] However, if the predictive value of these firms' accounting information is driving investors' use of it then the association between this accounting information and the investor feedback

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underwriters prefer using the bookbuilding method to price IPOs rather than fixed-price methods (Biais and Faugeron-Crouzet, 2002).

[9] Consistent with this idea that investors look to an IPO firm's historical information to determine its future prospects, Brau and Fawcett (2006) provide survey evidence that IPO investors consider "having strong historical earnings" as the strongest signal regarding an IPO firm's value.

received by IPO firms should vary based on the information's predictive value. Accordingly, I examine a cross-sectional setting in which the quality of this signal is likely to be either higher or lower. Specifically, I examine whether the relationship between issuers' expected future performance, as communicated by their accounting information, and the investor feedback received during the bookbuilding period is lower for R&D-intensive firms. I expect this relationship because the predictive value of a firm's accounting information is reduced by the high level of uncertainty about the future benefits associated with R&D investment (Lev and Sougiannis, 1996; Kothari et al., 2002). Thus, I make the following prediction:

> ***Prediction 2****: An IPO firm's expected future performance, as indicated by its fundamental signals, is less predictive of the investor feedback received during the bookbuilding process for R&D-intensive firms.*

The underlying premise of this paper is that investors will use an accounting-based signal to reduce the mispricing that arises from the competitive underwriter selection process. While my prior predictions seek to establish that investors are using an IPO firm's accounting information to revise the proposed price, they do not speak to whether or not investors use this information correctly. To this point, the prices proposed for IPO firms may actually reflect their long-term values but investors adjust them because they are unable to verify the private information included therein. In this case, investors' use of these firms' accounting information to convey their future prospects may actually reduce the accuracy of IPO pricing (Teoh et al., 1998; Kim and Ritter, 1999). Thus, it is imperative to examine the subsequent performance of IPO firms

to determine whether or not investors used this information to improve the accuracy of IPO pricing. Based on my hypothesis that investors used this information to revise the proposed prices closer to firms' long-term values, I make the following prediction:

> ***Prediction 3****: Investors' increased weighting of a firm's expected future performance, as indicated by its fundamental signals, increases the accuracy of IPO pricing.*

CHAPTER 3

Sample Selection and Variable Measurement

3.1 Data Sources and Sample Selection

I obtain a listing of all U.S. industrials that filed their initial registration statement with the SEC from 2001–2007 from the Global New Issues Database within Thomson Financial's SDC Platinum.[10] Consistent with prior research on IPO firms, I exclude from my sample: unit offers, ADRs, carve-outs/spin-offs, reverse LBOs, partnerships, financial firms (SIC code 6000-6999), and filings of less than $10 million. My research design further requires that IPO firms have comparable audited financial statements for the two years prior to their filing; firms without this information are also excluded from my study. Table 1 details this sample selection process resulting in 698 IPO filings that meet the criteria for inclusion in my study. Of these, 510 filings were successfully completed and the remaining 188 were withdrawn prior to completion.

The historical financial information for IPO firms is generally available through Compustat for the subset of firms that successfully complete an offering. However, it is not readily available for the subset of firms that elected to withdraw their filing during the registration process. To avoid the selection bias concerns associated with excluding

[10] I select this particular time period for my sample so that two highly unusual periods of IPO activity don't influence my results. First, I begin my period in 2001 to exclude IPOs completed during the internet bubble when IPOs exhibited anomalous pricing behavior (Ljungvist and Wilhelm, 2003). Second, I conclude my sample at the end of 2007 to avoid the financial crisis that also resulted in a period of unusual IPO pricing and activity.

this group of firms from my sample, I manually gather their information from their registration statements filed with the SEC.[11]

INSERT TABLE 1

3.2 Variable Measurement

I now discuss the construction of each variable used in my study and provide descriptive statistics for these variables in Table 2. I also include more detailed descriptions of each variable as part of Appendix A.

INSERT TABLE 2

3.2.1 Measuring Expected Firm Performance

The fundamental analysis literature examines the predictive value of detailed financial statement information.[12] I rely on this prior research, and surveys of institutional investors, to guide my selection of historical financial information that investors may recognize as useful signals of an IPO firm's future performance. Specifically, I choose a total of six fundamental signals from three distinct areas of the firm: profitability, capital structure, and operating efficiency. I then use a simple financial statement analysis process to create a measure that sorts the cross-section of IPO firms into groups based on their expected future performance. This measure (*Performance*) is constructed by assigning point values based on the directional changes observed for each fundamental

[11] Note that the inclusion of these firms significantly increases the data gathering costs for this study. While I could incorporate additional years in the study by manually gathering the information for the firms that withdrew their offerings in those years, the anomalous nature of the neighboring time periods (as described in footnote 10) present external validity concerns if I include these periods in my sample. Thus, I do not collect the additional data as I suspect that the costs associated with gathering this information will exceed the benefit gained from doing so.

[12] See Kothari (2001) and Richardson et al., (2010) for excellent overviews of the fundamental analysis literature.

signal included in the scoring model, with higher values predicting better future performance.

The first two fundamental signals included in my scoring model relate to changes in a firm's profitability. Specifically, I include Δ Earnings before Interest and Taxes (*Δ EBIT*) and Δ Cash Flow from Operations (*Δ CFO*). I choose EBIT rather than net income because there are often significant changes made to a firm's capital structure in conjunction with its IPO.[13] Thus, EBIT is often viewed as a more useful measure of an IPO firm's future profitability than is net income. While an increase in a growth firm's profitability is considered a positive signal of its future performance, so is an increase in its cash flow from operations. An increase in either of these two measures for an IPO firm sends a strong signal to investors that the firm has completed the start-up phase of its life cycle and has entered into its growth phase. Accordingly, I include both of these measures in my scoring model and assign IPO firms that show year-over-year increases in CFO or EBIT during the pre-IPO period a point value of one for each increase, zero otherwise.

The next two fundamental signals included in my scoring model examine recent changes in the capital structure of IPO firms. These two signals are Δ Leverage (*Δ Lev*) and Δ Property, Plant, and Equipment (*Δ PP&E*). A firm that decreases its leverage signals to investors that it is able to internally generate sufficient funds to operate its business (Myers and Majluf 1984). This provides new investors with some assurance that their equity position will not be significantly diluted in the near future.

[13] For example, Baker and Wurgler (2002) report that the average IPO firm's leverage ratio (measured as long-term debt to assets) decreased from 66.5 percent to 43.2 percent after going public.

Additionally, equity investors generally prefer that IPO firms use the proceeds from the offering to invest in the firm's growth rather than to satisfy debt obligations. Hence, firms that have reduced their debt in the pre-offering period generally appear more attractive to equity investors. [14] Capital expansion also sends a strong positive signal to investors that the firm's current growth opportunities exceed its prior production capacity (Cooper et al., 2008). Accordingly, I assign a point value of one for firms that have a year-over-year decrease (increase) in leverage (PP&E) during the pre-IPO period, zero otherwise.

The final two fundamental signals that I include in my scoring model examine the changes in an IPO firm's operating efficiencies. Specifically, I include Δ Asset Turnover ($\Delta\ AT$) and Δ Gross Margin ($\Delta\ GM$) in the scoring model. These two staples of the fundamental analysis literature are used to evaluate how well a firm is positioned to grow its business. An increase in asset turnover suggests that a firm is improving the manner in which it employs its capital. On the other hand, changes in gross margin measure the firm's changing position in its input markets relative to its output markets. IPO firms that have improved their asset turnover or gross margin signal their ability to increase their profitability with their current business model. Accordingly, I assign a point value of one for firms that show year-over-year increases in their asset turnover or gross margin during the pre-IPO period, zero otherwise.

[14] An argument could be made that an increase in a firm's leverage is a more positive signal of its future prospects than is a decrease in leverage. However, consistent with a decrease in leverage being viewed as a positive signal for IPO firms, Ernst & Young (2009) finds that 70 percent of surveyed institutional investors indicated that "reduced debt levels prior to the IPO event" was the type of corporate activity that created the most value for pre-listed firms.

As previously discussed, *Performance* is a composite score variable that sums the values of six binary signals. This simple approach produces a variable that can range from a low score of zero to a high score of six, with higher values predicting stronger future performance. As noted in prior research, there are two primary concerns that arise when employing scoring models to answer research questions. The first concern questions the selection method used to identify the individual components included in the composite score. In my case, each of the six fundamental signals selected has been used for decades in prior research and has been shown to be a useful signal of a firm's future performance. Prior research has identified far more than six signals (Ou and Penman, 1989). However, I selected these six signals to include in my scoring model based on their relevance to growth firms, which are the focus of my study.[15]

The second concern that arises from the use of my scoring model is the translation of continuous signals into binary signals. I select this simplified methodology for several reasons. First, prior studies have found that these signals retain much of their predictive ability when a simplified classification scheme is used (Piotroski, 2000; Wahlen and Wieland, 2011). Second, it allows multiple signals to be combined together in a simple and transparent manner when the combination of multiple signals is viewed as a better proxy than any individual signal. While an alternative approach would be to combine multiple signals by assigning a rank value to each firm's continuous signal relative to the cross-section of other firms, this ranking approach requires the user to identify all of the other firms in the cross-section to perform the analysis. On the other hand, my

[15] In selecting these six signals, I do not have any expectation that I have selected the optimal set of signals and make no attempts in the paper to identify the optimal set of signals for this purpose. However, Section 5.1 includes extensive robustness tests using various combinations of the six signals included in my composite score.

simplified approach requires the user to have only the IPO firm's two most recent years of accounting information, which is included in the firm's registration statement.[16]

3.2.2 Measuring Investor Feedback

I use five variables to measure the investor feedback received during the bookbuilding process. Each of these variables has been used in prior research and is computed so that higher values represent greater investor feedback received. These variables are computed as follows:

IPO Completion: I construct an indicator variable (*Public*) that takes the value of one if the IPO is successful, zero otherwise.

Price Range: I create an ordinal variable (*Range*) that captures where an IPO firm's final price is relative to the proposed pricing range. Specifically, *Range* has a value of zero for firms that withdraw their offering, one for firms that price below the proposed range, two for firms that price within the proposed range, and three for firms that price above the proposed range.

Price Revision: The price revision captures the percentage change between an IPO firm's final offer price and the midpoint of the initially proposed pricing range (*Revision*). Because this outcome is only observed for the subset of IPO firms that complete an offering, all inferences made when using *Revision* as a dependent variable are conditional on completing the offering.

Initial Return: An IPO firm's initial return captures the percentage change in a firm's stock price on its first day of trading on the secondary market (*Init_Return*). As

[16] In Section 5.1, I perform extensive robustness tests using alternative methodologies that allow for increased variation in the individual signal realizations. I find that my results are robust to several alternative methodologies.

noted in Section 2.2, the initial return may include a portion of the mispricing from the proposed offer price. Thus, I create an additional variable (*Tot_Revision*) that combines the price revision and the initial return into a single variable to capture the full extent of the mispricing for successfully completed offerings.

3.2.3 Measuring Firm Value

The *Performance* measure is designed to sort the cross-section of firms into groups based on their expected future performance. Thus, regardless of whether it has predictive value about the investor feedback received during the bookbuilding period, this measure should be value-relevant. While value-relevance studies generally use a firm's price per share as the dependent variable, the IPO literature has generally used alternative measures to examine questions of value-relevance since underwriters prefer to price each offering around $15 (Fernando et al., 2004). This clustering around a single price forces the explanatory power to come through the correlation between the variable of interest and the number of shares outstanding. As a result, value-relevance studies of IPO firms that use a traditional price per share measure generally have very little explanatory power and highly unstable results (Beatty et al., 2000).

To combat this problem, value-relevance studies of IPO firms generally use the total market value of equity or a log transformation of that amount as the dependent variable. Comparing models that use these two measures, those that use the log transformation generally provide the best fit (Beatty et al., 2000; Hand, 2003). Further, its distribution more closely resembles that of a normal distribution, providing it with

attractive econometric properties.[17] Thus, I follow prior research and use the log transformation of each firm's total market value of equity as the dependent variable for my tests of value-relevance. I calculate this measure at each of the three stages of the IPO process by taking the natural log of the product of the IPO firm's post-IPO shares and the midpoint of the proposed pricing range (*Initial*), the offer price (*Offer*), and the closing price on the firm's first day of trading on the secondary market (*Secondary*).

3.2.4 Control Variables

I include several control variables that prior research has shown to impact either IPO price formation or valuation. These variables primarily relate to IPO firm-specific accounting information but also include variables relating to deal characteristics and market conditions during the IPO process.

Firm-Specific: The firm-specific accounting information included as control variables in my study include the IPO firm's: book value of equity (*Book_Value*), cash flow from operations (*CFO*), total revenues (*Revenues*), R&D expenditures (*R&D*), leverage (*Leverage*), and both the signed and absolute value of earnings before income tax (*EBIT*, *Abs_EBIT*). I also include the percentage of the firm's post-IPO shares held by the firm's executives and directors (*Insider*). For consistency with the transformations made to firm value (and to enhance comparison with prior research), I also make log transformations to all of the IPO firm-specific variables with the exception of *Leverage*, which is a ratio. When the original value is positive for these variables, I make the transformation as log (1+value) but make the transformation as –log (1-value) when the

[17] In my sample, the distribution of firm value at the final offer price displays considerable non-normality as the skewness is 7.74 and the kurtosis is 87.24. However, the distribution of the natural log of firm value has a much closer resemblance to the normal distribution as the skewness is -0.01 and the kurtosis is 3.74.

value is negative. This transformation is able to retain the negative values included in the original data while also maintaining the monotonic relationship among the actual realized values.

Deal Characteristics: I also include several deal characteristics as control variables in my study that may impact either the IPO valuation or the price revision. Foremost, I control for the underwriter's reputation (*Underwriter*) using the average Carter-Manaster ranking of the lead underwriters (Carter and Manaster, 1990). I also include a variable indicating that a Big Five auditor signed off on the IPO firm's financial statements (*Auditor*), the natural log of one plus the number of risk factors disclosed in the initial registration statement (*Risk_Factors*), and the natural log of one plus the filing amount (*Filing_Amount*).

Market Conditions: Prior research finds that changes in macroeconomic conditions are a significant determinant of the price revision (Loughran and Ritter, 2002; Lowry and Schwert, 2004). Accordingly, I include two control variables that capture these changes in my study. First, I use the CRSP value-weighted index during each firm's registration period (*Mkt_Ret*). Second, I use the percentage of the successfully completed IPOs to the total number of completed IPOs (successfully completed + withdrawn) during each firm's registration period (*Mkt_Comp*).

Fixed Effects: I include both year and underwriter fixed effects in my analysis. Year fixed effects are included in my research design to remove any time-specific variation in the IPO price formation process. On the other hand, underwriter fixed effects are included to remove the idiosyncratic effect that each underwriter may have on the price formation process. For example, Liu and Ritter (2011) provide limited evidence that

underwriters receive compensation in the form of higher initial returns for packaging non-price dimensions (e.g., analyst coverage, price support) with their underwriting services. Thus, the underwriter fixed effects will remove the portion of the price changes that are associated with any non-price dimensions that are consistently offered by any individual underwriter.

CHAPTER 4

Empirical Results

4.1 Determinants of Investor Feedback

I begin my empirical analysis by examining the relationship between a firm's expected future performance and the investor feedback that it receives during the bookbuilding period. To do so, I estimate the following equation:

$$Feedback\_Variable_i = \beta_0 + \beta_1 Performance_i + \beta_2 Book\_Value_i + \beta_3 EBIT_i + \beta_4 Abs(EBIT)_i + \beta_5 CFO_i + \beta_6 Revenues_i + \beta_7 R\&D_i + \beta_8 Leverage_i + \beta_9 Risk\_Factors_i + \beta_{10} Auditor_i + \beta_{11} Filing\_Amount_i + \beta_{12} Underwriter_i + \beta_{13} Mkt\_Ret_i + \beta_{14} Mkt\_Comp_i + \beta_{15} Mid\_Price_i + \beta_{16} IPO\_Price_i + fixed\ effects + \varepsilon_i \quad \textbf{(1)}$$

where $Feedback\_Variable_i$ is either $Public_i$, $Range_i$, $Revision_i$, $Init\_Return_i$, or $Tot\_Revision_i$. Each of these dependent variables is defined in Section 3.2.2 of this paper and captures the investor feedback that is received during the IPO process. As motivated in Section 2.3, β_1 is the primary coefficient of interest for this model and is predicted to have a positive coefficient. All other variables included in the model are as defined in Section 3.2.4.[18]

INSERT TABLE 4

[18] Note that the investor feedback captures differences between the underwriter's proposed valuation and the final offer price. Given the absence of theory about which variables will be valued by underwriters and investors, and the lack of prior empirical research on this topic, the empirical model is admittedly ad-hoc. However, I include prior variables shown to influence investor feedback in prior literature (e.g., market conditions) as well as other variables that have been shown to influence firm value. By including these additional variables, I reduce the concern that my result is driven by omitted correlated variables.

Table 4, Panel A provides the results from estimating Equation 1. Consistent with the main prediction of this paper, I find that β_1 is positive and statistically significant in each of the models. This relationship is also economically meaningful as a one standard deviation increase in *Performance* is associated with a 4.6 percent increase in the probability that the IPO firm completes its offering (Model 1), a 5.1 percent increase in the price revision (Model 3), and a 3.8 percent increase in its initial return (Model 4).[19] The strength of this finding is also evidenced by the fact that the only other variable that is statistically significant in each model is *Mkt_Ret*, which captures the change in macroeconomic conditions during the registration period. This result highlights the value that investors associate with accounting information when evaluating IPO firms. It also combines with Lowry & Schwert (2004) to caution future research against using the underwriter's proposed price as an unbiased predictor of the final offer price.

Figure 2 charts the average price revision (*Revision*) and the average total revision (*Tot_Revision*) for each value of *Performance*. Consistent with the multivariate results documented in Panel A of Table 4, Figure 2 reveals a positive, nearly monotonic relationship between the values of *Performance* and the investor feedback received during the IPO process for the successfully completed offerings. Additionally, two well-established empirical patterns are evident from the graphical representation. First,

[19] As part of my additional analyses, I examine how this information about firms' future prospects differentially impacts firms' initial returns conditional on the sign of the price revision. As noted in Section 2.2, the partial adjustment hypothesis suggests that the information revealed by investors during the bookbuilding process will be fully (partially) impounded into the final offer price for proposed valuations that are above (below) investors valuations of the firm. Thus, if investors are using this information to adjust the proposed price then the *Performance* variable should only continue to have explanatory power over firms' initial returns when the information has not been fully impounded into the final offer price (e.g., when the price revision is not negative). Consistent with this logic, I find that the coefficient on the *Performance* variable is estimated to be insignificant (significantly positive) for offerings with negative (non-negative) price revisions. See Section 6.2 for additional information.

initial returns are significantly positive (Ibbotson and Jaffe, 1975; Ritter, 1984). Second, the initial returns are increasing in the price revision. This observation highlights the asymmetric price response to good and bad information revealed about IPO firms during the bookbuilding portion of the IPO process (Benveniste and Spindt, 1989; Hanley, 1993).

INSERT FIGURE 2

4.2 Value-Relevance

My prior results show that *Performance* is useful in explaining the cross-sectional variation in the investor feedback received during IPO price formation. However, the underlying motivation to create the *Performance* variable is to separate the more valuable firms from those that are less valuable. While my primary hypothesis is based on the premise that the proposed price does not accurately reflect the appropriate variation in the future prospects of IPO firms, this variation should be apparent at the conclusion of the bookbuilding process. Thus, I estimate the following OLS regression to examine the value-relevance of *Performance* at each stage of the IPO process:

$$\begin{aligned} Firm\_Value\_Variable_i = {} & \beta_0 + \beta_1 Performance_i + \beta_2 Book\_Value\_Post_i + \\ & \beta_3 EBIT_i + \beta_4 Abs(EBIT)_i + \beta_5 CFO_i + \beta_6 Revenues_i + \beta_7 R\&D_i + \beta_8 Leverage_i + \\ & \beta_9 Risk\_Factors_i + \beta_{10} Auditor_i + \beta_{11} Underwriter_i + \beta_{12} Insider_i + \\ & fixed\ effects + \varepsilon_i \end{aligned} \quad \textbf{(2)}$$

where *Firm_Value_Variable*$_i$ is either the natural log of one plus the IPO firm's total equity value based on the midpoint of the initial pricing range (*Initial*), the final offer price (*Offer*), or the firm's closing price on its first day of trading on the secondary market (*Secondary*). The primary variable of interest in this equation is the *Performance*

variable that is predicted to have a positive coefficient. All other variables included in the model are as defined in Section 3.2.4.

Panel B of Table 4 includes the results from estimating Equation 2. I find that the magnitude of β_1 is increasing at each progressive stage of the IPO process. Specifically, I find that β_1 is estimated as 0.0122 for the proposed price (Model 1), increases to 0.0366 for the offer price (Model 2), and ultimately to 0.580 when the firm is trading on the secondary market (Model 3).[20] This progression illustrates how the value-relevance of accounting information is altered by investors' use of that information during the bookbuilding process. While Bartov et al., (2002) highlighted that there were differences in the value-relevance of accounting variables across the different stages of the IPO pricing process, they made no attempt to explain why these differences existed. My results suggest that some of these differences stem from investors removing the incentives behind the underwriters' proposed prices.

4.3 Variation in Predictive Value

To reinforce that my initial finding was driven by investors' use of the accounting information of IPO firms, I examine a cross-sectional setting in which the predictive value of firms' accounting information is likely to be either higher or lower. Specifically, I classify the quartile of firms in my sample with the highest R&D intensity as producing a lower-quality signal relative to the other firms in my sample. I then partition the sample based on this designation (*R&D_Inten*) and re-estimate Equation 1

[20] The actual number of observations in my sample with a value for *Initial* is 580 as opposed to the 510 that are reported in Panel B of Table 4. As only 510 of the firms completed their offerings, 70 firms had disclosed their proposed valuation prior to withdrawing their offerings. When estimating Equation 2 for the full 580 observations in my sample, I find that the estimated coefficient is 0.0329 (t-statistic = 1.17) resulting in the same inferences when restricting the sample to the completed offerings. Thus, I elect to tabulate only the completed offerings in order to enhance the comparability of the estimates across the different stages of the IPO process.

for each partition of firms. Based on my expectation that investors will reduce their use of the firm's accounting information when it is of lower quality, I predict that β_1 will be lower for the more R&D-intensive group of firms.[21]

INSERT TABLE 5

Consistent with my prediction, Panel A of Table 5 reveals that the estimate for β_1 is lower for the more R&D-intensive group of firms in each of the five models, four of which indicate that the difference is statistically significant. This result is consistent with investors reducing their use of this accounting information when it is of lower quality. To reinforce this interpretation, I also re-estimate Equation 2 for each partition of firms. In untabulated results, I again find that the estimated coefficient for the *Performance* variable is always lower for the more R&D-intensive firms. Further, while the difference in the coefficient's magnitude *is not* statistically significant at the initial valuation (t-stat = -1.09), the difference *is* statistically significant at the conclusion of the price formation process (t-stat = -2.13). Taken together, the findings from Table 5 are consistent with my main prediction and provide evidence that the results documented in Table 4 are in fact being driven by investors' use of the issuing firm's accounting information.

4.4 IPO Pricing Accuracy

The underlying premise of my study is that investors can improve the accuracy of IPO pricing by increasing the weighting of firms' expected future performance, as indicated

[21] Separating my sample of firms on their R&D-intensity does not create a group of growth firms and a separate group of value firms. In fact, the underlying distributions reveal that the majority of firms in each group is in the lowest quintile of book-to-market ratios trading on the NYSE, AMEX or NASDAQ. Further, the mean and median book-to-market ratio for each group is in the lowest quintile of book-to-market ratios. This is a significant contrast to Piotroski (2000) who restricted his sample to those firms in the top quintile of the book-to-market ratio distribution.

by their accounting information. While my prior results show that investors are using this information to adjust the proposed price, they do not indicate whether investors used this information correctly. Accordingly, I now examine whether investors' increased weighting of this information improves the accuracy of IPO pricing.

To address this question, I examine the relationship between the *Performance* variable and the buy-and-hold abnormal returns earned by firms when they begin trading on the secondary market. If investors incorrectly applied the increased weighting to this accounting information when pricing these IPO firms then we would expect to see a negative relationship between the *Performance* variable and these firms' abnormal returns when they begin trading on the secondary market. On the other hand, if this information was used to increase the accuracy of IPO pricing then we should not observe this negative relationship. Accordingly, I form portfolios on the individual values of the *Performance* variable and examine the average buy-and-hold abnormal returns for each portfolio.

I measure each firm's BHAR by adjusting its gross returns for the first 180 days by its size and risk. Specifically, I subtract the returns earned by each firm's Fama-French 10x10 portfolio over the same period 180 day period. I choose 180 days because two prominent features that impact the secondary market pricing of IPOs are expired after 180 days of trading, namely insiders' lockup provisions (Field and Hanka, 2001) and underwriters' overallotment options (Lewellen, 2006). By allowing sufficient time for these features to expire, I remove concerns that the observed price is not a true market price. Using the Fama and French 10x10 portfolios as a benchmark, I follow Barber and

Lyon (1997) in applying the following calculation for issuing firm *i* over horizon *n* to derive each firm's buy-and-hold abnormal return:

$$BHAR_{i.n} = \left[\prod_{n=2}^{n=181}(1 + R_{i,n})\right] - \left[\prod_{n=2}^{n=181}(1 + R_{m,n})\right] \quad \textbf{(3)}$$

where $R_{i,n}$ is the gross stock return in period *n* for issuing firm *i* and $R_{m,n}$ is the benchmarked return in period *n* for benchmark *m*.

Contrary to the negative relationship that would exist if investors had used the information incorrectly, Figure 3 reveals a positive, nearly monotonic relationship between the values of *Performance* and *BHAR*. This finding suggests that investors' use of this accounting information improved the accuracy of IPO pricing. In fact, the positive relationship between *Performance* and *BHAR* suggests that the accuracy of IPO pricing could be further improved if investors had placed an even greater reliance on this information when pricing IPOs. Table 6, Panel A provides additional detail about this relationship revealing that the entire distribution of abnormal returns earned by IPO firms on the secondary market has shifted to the right for firms with higher values of *Performance.* This result closely resembles the one identified by Piotroski (2000) in his study examining the ability of a firm's fundamental signals to predict the abnormal returns of publicly traded value firms. To better understand the economic impact of my result, I design a pseudo-trading strategy that buys (sells) IPO firms with high (low) values of *Performance* and find that it produces annualized abnormal returns in excess of 11 percent.[22]

[22] I refer to the trading strategy as a pseudo-trading strategy since the IPOs occur at various times. Thus, it is not feasible to use the proceeds from shorting the low *Performance* firms to purchase the high *Performance* firms as is typically assumed in trading strategies.

Having shown that Performance is positively associated with BHAR, I now examine whether *Performance* provides incremental explanatory power about the BHAR of IPO firms. To do so, I estimate the following OLS equation:[23]

$$BHAR_i = \beta_0 + \beta_1 Performance_i + \beta_2 CRSP_i + \beta_3 BM_i + \beta_4 Secondary_i + \beta_5 Tot\_Revision_i + \beta_6 EBIT_i + \beta_7 Underwriter_i + \beta_8 Filing\_Amount_i + fixed\ effects + \varepsilon_i \quad \textbf{(4)}$$

Consistent with the distribution documented in Panel A of Table 6, Panel B reveals that β_1 is positive and statistically significant for the univariate regression (Model 1). Model 2 reveals that this positive association is robust to the inclusion of the other variables that have been documented to impact the abnormal returns earned by IPO firms. Consistent with prior research, I also find that firms' book-to-market ratio (*BM*), profitability (*EBIT*), the concurrent market conditions (*CRSP*), and underwriter prestige (*Underwriter*) are also all positively associated with firms' BHAR. Overall, Table 6 provides evidence that investors used these firms' expected future performance, as depicted by their accounting information, to improve the accuracy of IPO pricing.[24] They also provide additional evidence that IPO pricing accuracy could be further improved if investors placed greater reliance on the accounting information of IPO

[23] In addition to the standard controls used in tests of abnormal returns (BM, Size, Market Return), I also include variables that prior research has shown to predict abnormal returns of IPO firms. Specifically, I include *EBIT* to measure the firm's profitability (Peristiani and Hong, 2004; Purnanandam and Swaminathan, 2004), *Underwriter* to capture the prestige of the underwriter (Carter et al., 1998), *Filing_Amount* to capture the size of the offering (Carter et al, 1998) and the total revision (*Tot_Revision*) to capture the momentum at the time of the offering.

[24] One could employ several different techniques to examine whether the increased weighting of the *Performance* variable improved the accuracy of IPO pricing. One alternative to the method outlined above is to compare the price after 181 trading days to both the proposed price and a price determined by fitting an OLS regression using only the proposed price and the *Performance* variable. Using this alternative approach, I find that the fitted value has lower absolute pricing differences for 61.9% of the 510 completed offerings. Thus, this alternative approach yields the same inference as that drawn from examining the relationship between *Performance* and *BHAR*.

firms (Peristiani and Hong, 2004; Purnanandam and Swaminathan, 2004; Demers and Joos, 2007; Bhattacharya et al, 2010; Gao et al., 2012).

INSERT TABLE 6

4.5 Variation in Investor Sophistication

My finding that *Performance* continues to have predictive value on the secondary market (Table 6) raises questions about why investors would use this information to revise the proposed price but not impound its full value-relevance into the final price. One reason that investors may not completely extract this information is because they have limited information-processing abilities (Merton, 1987). To examine how investors' information processing abilities influence the secondary market predictive value of the *Performance* variable, I examine a cross-sectional setting where the investors participating in the bookbuilding process have information-processing abilities that are either higher or lower. Specifically, I partition my sample of firms based on whether a top-tier underwriter facilitated the offering. This partition allows me to examine this question since IPOs facilitated by lower-quality underwriters place a greater portion of the initial allocation with retail investors (Field and Lowry, 2009).[25]

INSERT TABLE 7

Consistent with investors' information-processing abilities influencing the extent to which a firm's accounting information is reflected in its final offer price, Table 7 reveals that the results documented in Table 6 are primarily driven by the offerings conducted

[25] Ideally, I would like to use the percentage of the issuer's shares allocated to institutional investors to make my partition. However, this data is not publicly available and an attempt to use the holdings at the end of the first quarter will not be accurate due to the high trading volume that occurs during the immediate post-offering period.

by lower-tier underwriters. Specifically, Panel A of Table 7 reveals that the trading strategy employed among offerings conducted by lower-tier underwriters generates more than three-times the amount of abnormal returns than the same strategy employed among offerings conducted by top-tier underwriters (22.3 percent annualized BHAR vs. 6.7 percent annualized BHAR). Further, the BHAR from the trading strategy are only statistically significant for the offerings conducted by lower-tier underwriters (t-stat 2.381 vs. t-stat 1.226).

Panel B of Table 7 provides the results from estimating Equation 4 partitioned by underwriter quality. Consistent with the results documented in Panel A, Columns 1-2 of Panel B show that the statistically significant positive association between *Performance* and *BHAR* is concentrated in the offerings conducted by lower-tier underwriters. Columns 3-4 of Panel B also show that this result is robust to the inclusion of other determinants known to influence the secondary market performance of IPO firms. Taken together, Table 7 provides information about why *Performance* continues to have explanatory power even after the bookbuilding process is concluded. It also provides further evidence that investors' information processing abilities have a significant impact on the extent to which market prices reflect the full value-relevance of publicly available information (Bartov et al., 2000; Cohen and Frazzini, 2008).

CHAPTER 5

Robustness Tests

5.1 Alternative Measures of Performance

My results suggest that investors use an accounting-based signal about the future prospects of IPO firms to revise the prices proposed for offerings closer to these firms' long-term values. As noted in Section 3.2.2, some concerns arise from my use of a binary scoring model to perform my tests. In this section, I address these concerns by examining the robustness of my main results to several alternative measures of *Performance*.

As noted previously, I select six fundamental signals to include in my scoring model. While I explain the reasoning for choosing multiple signals in Section 3.2.2, one potential concern with my measure is that a single fundamental signal is driving my results, making it unnecessary to construct the *Performance* measure. To rule out this concern, I construct six alternative measures ($Performance_{1\text{-}6}$) that drop one of the six fundamental signals included in the original scoring model and re-estimate Equations 1, 2, and 4.[26] Similar to the original *Performance* variable, Table 8 reveals that the coefficients for these alternative measures of *Performance* are estimated to be positive and statistically significant for each of the dependent variables examined in my study

[26] Specifically, the alternative measures are computed as follows: $Performance_1$ = *Performance* – Δ *AT*, $Performance_2$ = *Performance* – Δ *Lev*, $Performance_3$ = *Performance* – Δ *PP&E*, $Performance_4$ = *Performance* – Δ *CFO*, $Performance_5$ = *Performance* – Δ *GM* and $Performance_6$ = *Performance* – Δ *EBIT*.

with the exception of *Initial*. This provides evidence that my results are not driven by any single fundamental signal included in my scoring model. Additionally, I re-estimate each of the regressions using each individual fundamental signal separately and find that no individual signal is estimated to be statistically significant as frequently as any of the composite scores.[27]

INSERT TABLE 8

A second potential concern with my measure arises from my use of binary signals. While I explain the reasoning for this scoring approach in Section 3.2.2, alternative combinations of the six signals that allow for increased variation should yield similar results. Accordingly, I perform additional robustness tests by constructing two alternative measures ($Performance_{7\text{-}8}$) that allow for increased variation in the individual signals.[28] Table 8 reveals that the coefficient for each of these alternative measures is estimated to be positive and statistically significant for all nine of the different models examined in my study. Also, I find that the t-statistics are noticeably higher for the value-relevance regressions when using these alternative measures that utilize the variation in each of the fundamental signals. Consistent with prior studies (Piotroski, 2000), these results suggest that there is slight loss of efficiency from using the simplified methodology.

[27] For brevity, I do not tabulate the regressions using the individual fundamental signals. However, the correlations between each of the individual components and the various dependent variables are provided for readers in Panel B of Table 3. As expected, the correlations between each individual signal and the dependent variables are all positive.

[28] Specifically, $Performance_7$ assigns values to each firm based on the continuous realization of its fundamental signals in comparison to the prior year's decile cutoffs. It then sums these decile rankings to form the aggregate performance measure. $Performance_8$ ranks the continuous realization for each fundamental signal for the entire cross section of firms (e.g., ranks 1-698) and sums the ranks together to form the aggregate measure.

5.2 The 2005 Securities Offering Reform

One reason that I expect investors place a significant weight on the accounting information to assess the future prospects of IPO firms is because of the scarcity of other information available about these firms during the registration process. The Securities Offering Reform was placed into effect on December 1, 2005 which modified the registration, communications, and offering processes under the Securities Act of 1933. The SEC notes that *"Among many other provisions, the rules update and liberalize permitted offering activity and communications to allow more information to reach investors by revising the "gun-jumping" provisions under the Securities Act."* Because this offering reform potentially provides IPO investors more timely information about the issuer during the registration process, its enactment may alter the extent to which investors rely on firms' historical financial information as a signal of their future prospects.

To examine how the enactment of the 2005 Securities Reform influenced my findings, I modify Equations 1, 2, and 4 and examine whether my results are driven by pre-reform offerings. Specifically, I include an indicator variable identifying whether or not the offering began following the enactment of the 2005 reform and the interaction of this indicator variable with the *Performance* variable. Similar to the results reported throughout Chapter 4, I find that the *Performance* variable is estimated to be positive and is statistically significant for all of the estimations with the exception of when *Initial* is used as the dependent variable in Equation 2. Also, I find that the interaction term is not statistically significant for any of the regressions suggesting that investors' use of an IPO firm's historical accounting information as a signal of its expected firm performance has

not significantly changed in the new regulatory environment. These results also provide evidence that the results in Chapter 4 are robust across time.

CHAPTER 6

Additional Analyses

6.1 Reputational Effects of Marketing Overpriced Securities

Theory suggests that underwriters incur reputational damage from marketing overpriced securities (Beatty and Ritter, 1986; Chemmanur and Fulghieri, 1994). However, this theory is difficult to understand if the price revision is entirely driven by factors outside of the underwriter's control (e.g., changes in macroeconomic conditions), as has been the focus of prior empirical studies. In contrast, my findings suggest that underwriters systematically exclude value-relevant information from their proposed prices. Thus, my findings link this reputational penalty to an underwriter's action rather than a random event.

Given this link, I estimate the following OLS regression to examine whether underwriters incur reputational damage for marketing overpriced securities:[29]

$$\Delta\_Mkt\_Share\_Var_{i,t+1} = \beta_0 + \beta_1 Rep\_Var_{i,t} + \beta_2 Init\_Return\_Rep_{i,t} + fixed\ effects + \varepsilon_{i,t} \quad \textbf{(5)}$$

where $\Delta\_Mkt\_Share\_Var_{i,t+1}$ captures the future change in an underwriter's market share. This variable is measured as the percentage change in either the number of offerings facilitated by underwriter i in year $t+1$ ($\Delta\_Mkt\_Share\_Count_{i,t+1}$) or the percentage

[29] Unlike my prior analyses, this analysis requires no financial history about issuing firms. Thus, I expand my sample for this analysis to include those firms that were not included in my prior analysis. I also extend my time period to 2011 to increase the power of my tests. This increases my sample size to a total of 1,050 IPOs.

change in the dollar amount of the offerings facilitated by underwriter *i* in year *t+1*(*Δ_Mkt_Share_Amount* $_{i,t+1}$). $Rep\_Var_{i,t}$ is the variable of interest and is designed to capture how well underwriter *i* has been able to price its offerings relative to its proposed prices over the previous two-year period.[30] I measure this variable as either the percentage of underwriter *i*'s offerings that have been successfully completed ($Public\_Rep_{i,t}$), the average pricing outcome of underwriter *i*'s offerings relative to the proposed pricing range ($Range\_Rep_{i,t}$), or the average price revision of underwriter *i*'s successfully completed offerings ($Revision\_Rep_{i,t}$).[31] Following prior literature that suggests that initial returns negatively influence underwriter reputation (Beatty and Ritter, 1986; Nanda and Yun, 1997), I also include $Init\_Return\_Rep_{i,t}$ in my model which is defined as the average initial return of underwriter *i*'s offerings over the previous two-year period.

INSERT TABLE 9

Table 9, Panel B provides the results from estimating Equation 5. This panel reveals that β_1 is estimated to be positive and is statistically significant in each model. Focusing on Model 6, the economic magnitude of this finding suggests that a one standard deviation change in *Revision_Rep* is positively associated with a 0.5 percent change in an underwriter's market share. Given that the average annual size of the IPO market was $15.3 billion in the U.S. during this sample period, a 0.5 percent change is equivalent to

[30] I also perform my tests using one-year and three-year periods to capture the underwriter's pricing reputation. For each of these alternative time periods, the results are qualitatively similar to those using the two-year period.

[31] Similar to the *Range* variable used in my prior analyses, the *Range_Rep* variable assigns the value of zero to firms that withdraw their offering, one to firms that price below the proposed pricing range, two to firms that price within the proposed pricing range, and three to firms that price above the proposed pricing range.

$76.5 million in proceeds. While prior theory alludes to this relationship, this is the first empirical evidence to my knowledge that underwriters incur reputational damage from marketing overpriced initial public offerings.

6.2 *Performance* and the Partial Adjustment Phenomenon

In Sections 3.2.2 and 4.1, I include firms' initial returns (*Init_Return*) as one of the variables that captures the investor feedback received as part of the bookbuilding process. I include this as one of the investor feedback variables because the bookbuilding mechanism is designed to reward investors that reveal that their valuation exceeds the proposed valuation by only partially impounding their revealed information into the final offer price. However, as discussed in Section 2.2, all of the information must be impounded into the final offer price if investors' valuations are below the proposed price in order for the market to clear.

This asymmetric response to the information revealed by investors suggests that the *Performance* variable should not continue to have explanatory power about firms' initial returns if there was a negative price revision. Thus, I modify Equation 1 to include an indicator variable that takes the value of one if there was a non-negative price revision (*Revision_Pos*), zero otherwise. I also include the interaction of this variable with the *Performance* variable in the modified equation. I provide the results of estimating this modified equation in Table 10. Consistent with the partial adjustment phenomenon, Column 2 of Table 10 reports that the coefficient for the interaction variable is estimated to be positive and is statistically significant (t-stat = 2.45) while the main effect for *Performance* is statistically insignificant (t-stat = 0.34). Also, we observe that the inclusion

of the interaction reduces the coefficient for the *Revision_Pos* variable. This attenuating effect provides further evidence that the *Performance* variable represented a portion of the information revealed about the value of IPO firms that was not included in the final offer price.

CHAPTER 7

Conclusion

This study examines how accounting information influences investors' evaluations of IPO firms. Prior research has attempted to answer this question by examining how an IPO firm's accounting information relates to its final offer price. However, a research design using price levels is unable to disentangle whether investors are using the firm's accounting information or simply relying on the underwriter's proposed valuation. To overcome this limitation, I examine the investor feedback provided to underwriters *after* the underwriters have proposed a valuation for the offering.

I predict and find that an accounting-based signal about the future prospects of IPO firms is not fully captured in the price that the underwriter proposes for the offering and that investors use the bookbuilding process to adjust the proposed price to more fully reflect this information. I also show that investors' use of this accounting information improves the accuracy of IPO pricing. Finally, I show that this information is more likely to be fully impounded into the final offer price when there is greater participation from institutional investors in the bookbuilding process. These findings highlight the value that investors associate with an IPO firm's accounting information and reveal that the price revision is much more predictable than suggested by the extant literature.

Figures

Figure 1. IPO Timeline

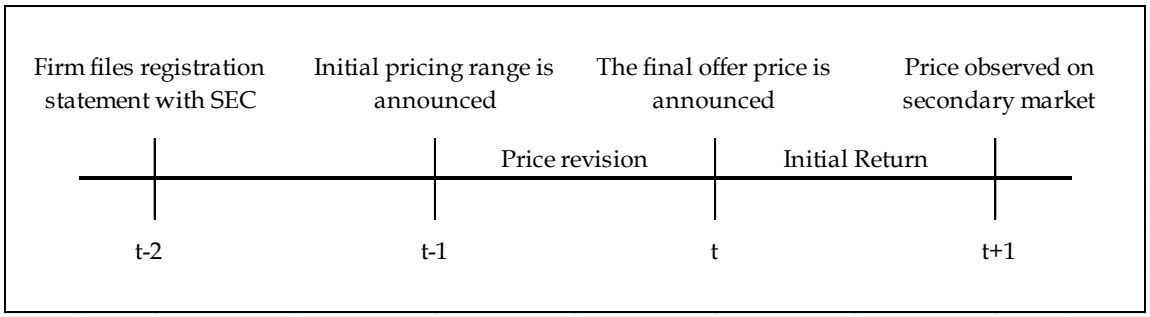


Figure 2. Mean Investor Feedback by *Performance*

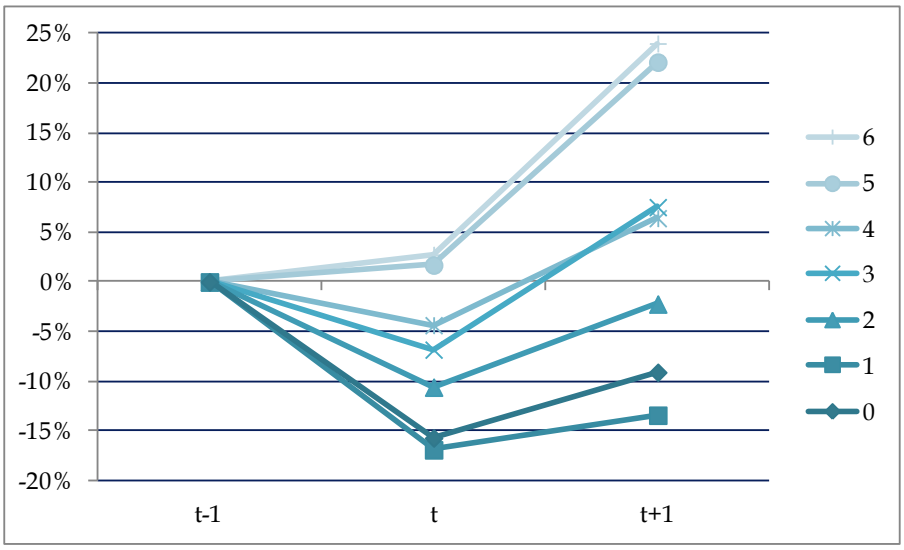
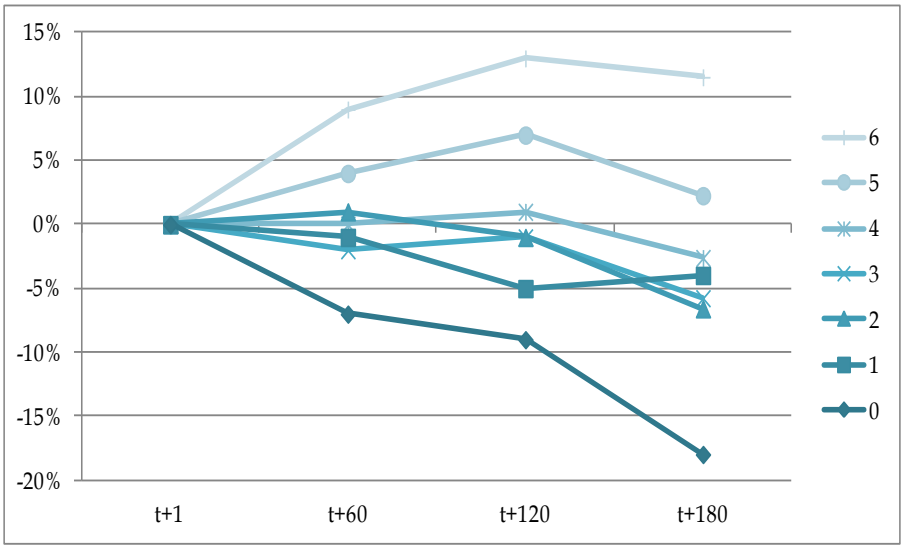


Figure 3. Mean *BHAR* by *Performance*



Tables

Table 1. Final Sample

Panel A. Sample Selection

Details	Observations
SDC Platinum listing of U.S. firms that filed their original IPOs during 2001 - 2007, excluding unit offers, ADR's, carve-outs/spin-offs, reverse LBOs, partnerships, hedge funds (SIC code 6726), and firms filing on foreign exchanges.	938
Less: Financial firms (SIC code 6000 - 6999)	142
Less: IPO firms with incomplete data	98
Final Sample	698

Notes: This panel details my sample selection process and reports the final number of firms included in my empirical analysis.

Panel B. Sample Distribution

Industry Classification	2001	2002	2003	2004	2005	2006	2007	Total
Consumer Non-Durables	0	1	3	3	5	4	1	17
Consumer Durables	0	1	3	2	5	3	3	17
Manufacturing	2	1	3	1	12	9	6	34
Oil & Gas	2	2	1	3	11	13	7	39
Chemicals	0	0	1	6	3	8	1	19
Business Equipment	9	15	12	46	34	26	34	176
Telecommunications	0	1	3	5	8	5	7	29
Utilities	1	0	0	2	1	0	3	7
Wholesale	4	9	6	20	16	17	8	80
Healthcare	12	15	12	46	31	37	40	193
Other	6	9	12	18	12	12	18	87
Total	36	54	56	152	138	134	128	698

Notes: This panel details the distribution of my final sample reporting both the year and Fama-French 12 industry classification.

Table 2. Descriptive Statistics

Panel A. Descriptive statistics for IPO firms

	Full Sample					
Variable	N	Mean	Std. Dev	Q1	Median	Q3
Initial	510	12.67	0.87	12.26	12.63	13.15
Offer	510	12.60	0.93	12.03	12.60	13.16
Secondary	510	12.70	0.99	12.11	12.68	13.34
Public	698	0.73	0.44	0.00	1.00	1.00
Range	698	1.43	1.04	0.00	2.00	2.00
Range	510	1.95	0.66	2.00	2.00	2.00
Revision	510	-0.05	0.20	-0.18	0.00	0.08
Init_Return	510	0.13	0.21	0.00	0.08	0.23
Tot_Revision	510	0.09	0.38	-0.17	0.04	0.29
BHAR	510	-0.01	0.36	-0.28	-0.06	0.21
Performance	698	3.56	1.56	2.00	4.00	5.00
Book_Value	698	-0.11	3.94	-3.87	-0.76	3.58
Book_Value_Post	510	2.75	3.30	2.22	3.86	4.77
EBIT	698	0.45	3.00	-2.49	0.91	3.16
Abs(EBIT)	698	5.34	2.70	3.50	5.51	7.05
CFO	698	0.77	2.85	-2.21	1.34	3.25
Revenues	698	3.99	2.17	2.68	4.21	5.58
R&D	698	1.29	1.31	0.00	1.15	3.25
Leverage	698	1.56	1.41	0.70	1.02	2.02
Risk_Factors	698	3.54	0.25	3.37	3.56	3.71
Auditor	698	0.88	0.33	1.00	1.00	1.00
Insider	510	0.33	0.14	0.28	0.36	0.42
Filing_Amount	698	4.51	0.85	3.93	4.44	4.99
Underwriter	698	7.77	1.71	7.00	8.50	9.00
Mkt_Ret	698	16.11	26.86	-0.88	16.21	33.10
Mkt_Comp	698	73.58	10.95	69.05	73.68	80.00
Mid_Price	510	14.33	6.63	12.00	14.00	16.00
IPO_Price	510	13.69	6.34	10.00	13.00	17.00
BM	510	0.23	0.33	0.03	0.18	0.37
CRSP	510	0.03	0.08	-0.01	0.05	0.08

Notes: This panel provides descriptive statistics for my sample of firms. The data used in this study is collected from a variety of sources including COMPUSTAT, CRSP, the SEC EDGAR database and Jay Ritter's IPO Database. Each variable is motivated in Section 3 and is defined in Appendix A.

Table 2. Descriptive Statistics, Continued

Panel B. Pearson Correlations (Independent Variables)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	*Performance*	1																		
2	*Book_Value*	0.26	1																	
3	*Book_Value_Post*	0.19	1	1																
4	*EBIT*	0.48	0.49	0.39	1															
5	*Abs(EBIT)*	-0.02	0.15	0.08	0.32	1														
6	*CFO*	0.49	0.43	0.35	0.81	0.24	1													
7	*Revenues*	0.50	0.42	0.32	0.77	0.37	0.74	1												
8	*R&D*	-0.26	-0.39	-0.31	-0.48	0.02	-0.39	-0.40	1											
9	*Leverage*	-0.32	-0.66	-0.64	-0.44	-0.09	-0.41	-0.44	0.34	1										
10	*Risk_Factors*	-0.06	-0.16	-0.12	-0.28	-0.12	-0.23	-0.25	0.27	0.11	1									
11	*Auditor*	-0.02	-0.12	-0.07	-0.02	0.20	-0.01	0.10	0.19	0.10	-0.03	1								
12	*Insider*	0.02	-0.14	-0.01	-0.10	-0.09	-0.11	-0.13	0.12	0.03	0.06	0	1							
13	*Filing_Amount*	0.19	0.25	0.27	0.48	0.59	0.49	0.63	-0.13	-0.25	-0.07	0.22	-0.08	1						
14	*Underwriter*	0.16	0.02	0.06	0.16	0.38	0.18	0.34	0.21	-0.12	0.11	0.44	0.04	0.58	1					
15	*Mkt_Ret*	-0.12	-0.01	0.01	-0.01	0.07	0.06	0.00	0.01	0.06	-0.16	0.00	0.03	0.07	-0.09	1				
16	*Mkt_Comp*	-0.09	-0.06	-0.06	-0.10	-0.02	-0.07	-0.09	0.11	0.03	-0.06	0.09	-0.02	-0.07	-0.01	0.00	1			
17	*Mid_Price*	0.12	0.19	0.18	0.31	0.40	0.28	0.35	-0.03	-0.16	0.01	0.12	-0.07	0.49	0.31	-0.05	0.00	1		
18	*IPO_Price*	0.23	0.21	0.19	0.38	0.38	0.35	0.45	-0.13	-0.19	-0.02	0.10	-0.07	0.64	0.36	0.05	-0.06	0.88	1	
19	*BM*	0.11	0.73	0.73	0.36	0.08	0.37	0.33	-0.32	-0.56	-0.11	-0.10	-0.17	0.20	0.00	-0.01	-0.01	0.16	0.12	1
20	*CRSP*	-0.05	0.01	0.03	0.01	0.00	0.00	-0.07	-0.03	0.03	0.06	-0.04	0.06	-0.07	-0.04	-0.15	-0.20	0.00	-0.05	-0.01

Notes: This panel reports Pearson correlation coefficients for the independent variables used in my study. Each variable is motivated in Section 3 and is defined in Appendix A.

Table 3. The *Performance* Variable

Panel A. *Performance* Variable Construction

Signal	Information Content	Score = +1	Score = 0	Mean
Δ CFO	Operating Cash Flow	Increase	Non-Increase	0.58
Δ EBIT	Profitability	Increase	Non-Increase	0.62
Δ GM	Gross Margin	Increase	Non-Increase	0.48
Δ AT	Asset Turnover	Increase	Non-Increase	0.70
Δ PP&E	Fixed Capital	Increase	Non-Increase	0.67
Δ LEV	Leverage	Decrease	Non-Decrease	0.50

Notes: This panel details the construction of the *Performance* variable including the mean value for each of the individual fundamental signals included in the variable's construction. Additional information about the *Performance* variable and each of the individual fundamental signals included therein is included in Section 3.2.

Table 3. The *Performance* Variable, Continued

Panel B. Pearson Correlations (Dependent Variables)

	Variable	1	2	3	3	4	5	6	7	8	9	10	11	12	13	14	15
1	*Public*	1															
2	*Range*	0.84	1														
3	*Revision*	.	0.70	0.70	1												
4	*Init_Return*	.	0.45	0.45	0.47	1											
5	*Tot_Revision*	.	0.68	0.68	0.86	0.84	1										
6	*Initial*	.	0.03	0.03	0.13	0.11	0.15	1									
7	*Offer*	.	0.19	0.19	0.37	0.21	0.34	0.97	1								
8	*Secondary*	.	0.25	0.25	0.43	0.38	0.47	0.94	0.98	1							
9	*BHAR*	.	-0.03	-0.03	-0.02	0.02	-0.01	0.06	0.05	0.05	1						
10	*Performance*	0.14	0.22	0.23	0.29	0.21	0.29	0.17	0.24	0.26	0.14	1					
11	*Δ CFO*	0.13	0.17	0.14	0.18	0.07	0.14	0.08	0.12	0.13	0.15	0.61	1				
12	*Δ EBIT*	0.13	0.17	0.13	0.26	0.15	0.23	0.18	0.24	0.26	0.09	0.71	0.46	1			
13	*Δ GM*	0.10	0.11	0.06	0.16	0.02	0.10	0.08	0.12	0.12	0.06	0.61	0.24	0.44	1		
14	*Δ AT*	0.04	0.10	0.13	0.17	0.17	0.20	0.10	0.13	0.16	0.08	0.50	0.21	0.29	0.16	1	
15	*Δ PP&E*	0.02	0.08	0.13	0.09	0.12	0.13	0.07	0.08	0.10	0.01	0.33	-0.06	-0.04	0.04	0.00	1
16	*Δ LEV*	0.01	0.08	0.15	0.09	0.14	0.14	0.05	0.07	0.08	0.07	0.45	0.09	0.14	0.06	-0.02	0.15

Notes: This panel reports Pearson correlation coefficients for the individual fundamental signals that comprise the *Performance* variable and each of the dependent variables that are used in my study. All variable definitions are included in Appendix A.

Table 4. Determinants of Investor Feedback and IPO Valuation

Panel A: Determinants of Investor Feedback

Variables	Predicted Sign	*Public* (1)	*Range* (2)	*Revision* (3)	*Init_Return* (4)	*Tot_Revision* (5)
Performance	+	0.1507***	0.1647***	0.0325***	0.0245***	0.0636***
		(3.43)	(5.12)	(5.22)	(4.04)	(6.33)
Book_Value		0.0225	-0.0002	-0.0033	-0.0020	-0.0057
		(0.92)	(-0.02)	(-1.48)	(-0.66)	(-1.21)
EBIT		0.0461	0.0148	0.0027	-0.0023	-0.0009
		(1.32)	(0.63)	(0.51)	(-0.34)	(-0.09)
Abs_EBIT		0.0126	-0.0472**	-0.0208***	-0.0134***	-0.0358***
		(0.40)	(-2.10)	(-6.12)	(-2.76)	(-5.33)
CFO		-0.0149	-0.0463**	-0.0141***	-0.0124*	-0.0273**
		(-0.43)	(-2.02)	(-2.81)	(-1.70)	(-2.47)
Revenues		0.0302	0.0061	-0.0036	0.0051	0.0023
		(0.63)	(0.21)	(-0.52)	(0.71)	(0.19)
R&D		0.0532	0.0087	-0.0073	0.0008	-0.0050
		(0.89)	(0.26)	(-0.99)	(0.11)	(-0.43)
Leverage		0.1337**	0.0447	0.0067	0.0020	0.0104
		(2.12)	(1.20)	(0.94)	(0.20)	(0.65)
Risk_Factors		0.1324	0.0764	0.0221	-0.0205	0.0322
		(0.45)	(0.37)	(0.55)	(-0.53)	(0.45)
Auditor		-0.3488*	-0.2473*	-0.0337	-0.0220	-0.0581
		(-1.70)	(-1.96)	(-1.46)	(-0.76)	(-1.30)
Filing_Amount		-0.4603***	0.0598	0.1978***	0.0491**	0.3000***
		(-3.73)	(0.66)	(10.40)	(2.34)	(9.19)
Underwriter		0.0539	0.0206	-0.0100	0.0193**	0.0084
		(0.99)	(0.64)	(-1.35)	(2.35)	(0.58)
Mkt_Ret		0.0141***	0.0110***	0.0012***	0.0008**	0.0020***
		(5.21)	(7.59)	(4.42)	(2.09)	(3.29)
Mkt_Comp		0.0330***	0.0135***	-0.0016**	-0.0018**	-0.0037***
		(4.94)	(3.16)	(-2.05)	(-2.38)	(-2.67)
Mid_Price				-0.0056***		-0.0089***
				(-3.81)		(-3.00)
IPO_Price					0.0034	
					(1.60)	
Underwriter Fixed Effects		Included	Included	Included	Included	Included
Year Fixed Effects		Included	Included	Included	Included	Included
Observations		698	698	510	510	510
Adjusted R-Squared		-	0.1501	0.4216	0.1369	0.3339
Pseudo R-Squared		0.1799	-	-	-	-

Notes: This table reports pooled regressions using several dependent variables that capture the investor feedback received during the bookbuilding portion of the IPO process. *Performance* is the primary variable of interest for this table and is predicted to be positive. All variables are motivated in Section 3 and are defined in Appendix A. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 4. Determinants of Investor Feedback and IPO Valuation, Continued

Panel B. Determinants of IPO Valuation

Variables	Predicted Sign	*Initial* (1)	*Offer* (2)	*Secondary* (3)
Performance	+	0.0122	0.0366**	0.0580***
		(0.68)	(2.00)	(2.76)
Book_Value_Post	+	0.0239**	0.0260**	0.0249**
		(2.36)	(2.47)	(2.21)
EBIT	-	-0.0114	-0.0141	-0.0130
		(-0.50)	(-0.60)	(-0.51)
Abs_EBIT	+	0.1082***	0.0986***	0.0942***
		(8.70)	(7.71)	(6.53)
CFO	+	0.0468**	0.0406**	0.0289
		(2.44)	(2.00)	(1.21)
Revenues	+	0.0691***	0.0956***	0.1073***
		(2.68)	(3.36)	(3.55)
R&D	+	0.0851***	0.0608**	0.0610**
		(3.25)	(2.24)	(2.04)
Leverage	+	0.0208	0.0436	0.0455
		(0.91)	(1.58)	(1.64)
Risk_Factors	+	0.2003	0.2075	0.1856
		(1.52)	(1.41)	(1.17)
Auditor	?	-0.1301	-0.1917**	-0.2189**
		(-1.55)	(-2.08)	(-2.33)
Underwriter	+	0.1395***	0.1499***	0.1725***
		(7.10)	(6.65)	(6.93)
Insider	+	0.1215	0.2198	0.2861*
		(0.81)	(1.45)	(1.71)
Underwriter Fixed Effects		Included	Included	Included
Year Fixed Effects		Included	Included	Included
Observations		510	510	510
Adjusted R-Squared		0.6841	0.6604	0.6142

Notes: This table reports pooled log-linear regressions where the dependent variables represent the natural log of firm value at each stage of the IPO pricing process. *Performance* is the primary variable of interest for this table and is predicted to be positive. All variables are motivated in Section 3 and are defined in Appendix A. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 5. The Differential Impact of *Performance* on Investor Feedback

Variables	Predicted Sign	*Public* (1) Low Quality	*Public* (2) High Quality	*Range* (3) Low Quality	*Range* (4) High Quality	*Revision* (5) Low Quality	*Revision* (6) High Quality	*Init_Return* (7) Low Quality	*Init_Return* (8) High Quality	*Tot_Revision* (7) Low Quality	*Tot_Revision* (8) High Quality
Performance		-0.1180	0.1350***	0.0416	0.1698***	0.0287**	0.0378***	-0.0067	0.0340***	0.0322	0.0805***
		(-0.80)	(2.91)	(0.57)	(4.99)	(2.30)	(5.58)	(-0.47)	(4.73)	(1.57)	(6.77)
Diff of $\beta_{Performance}$ =Low - High Quality	-	t-statistic: -1.65*		t-statistic: -1.68*		t-statistic: -0.68		t-statistic: -2.65***		t-statistic: -2.00**	
Remaining Controls		Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year Fixed Effects		Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Observations		176	522	176	522	122	388	122	388	122	388
Adjusted R-Squared		-	-	0.1806	0.1277	0.7189	0.2758	0.2208	0.1006	0.6229	0.2040
Pseudo R-Squared		0.3982	0.1052	-	-	-	-	-	-	-	-

Notes: This table reports regressions partitioned by the R&D intensity of the issuing firms. Low (High) Quality represents the top quartile (bottom three quartiles) of R&D intensive firms in my sample. For each partition, I estimate OLS regressions using several dependent variables that capture the price changes that occur during the bookbuilding portion of the IPO process. The difference between the coefficient estimated for the *Performance* variable for the Low Quality partition and the coefficient estimated for the *Performance* variable for the High Quality partition is the primary variable of interest for this table and is predicted to be negative. All variables are motivated in Section 3 and are defined in Appendix A. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 6. *Performance* and Post-IPO Stock Returns

Panel A: Distribution of *BHAR* by *Performance*

	All Firms					
	n	Mean	Q25	Median	Q75	% Positive
Sample	510	-0.014	-0.276	-0.055	0.212	0.424
Performance						
0	11	-0.180	-0.307	-0.162	-0.003	0.091
1	43	-0.040	-0.293	-0.183	0.127	0.326
2	64	-0.066	-0.328	-0.081	0.174	0.406
3	96	-0.057	-0.337	-0.117	0.130	0.365
4	116	-0.026	-0.282	-0.078	0.204	0.414
5	122	0.023	-0.251	-0.003	0.226	0.492
6	58	0.115	-0.100	0.110	0.345	0.586
Low *Performance*	54	-0.068	-0.303	-0.172	0.036	0.278
High *Performance*	180	0.052	-0.228	0.024	0.264	0.522
= High - Low	234	0.056	-0.105	0.058	0.195	0.568
t-statistic	-	2.41**	-	2.30**	-	-

Notes: This panel reports the average buy-and-hold abnormal returns (*BHAR*) earned from portfolios of IPO firms based on values of *Performance*. Each firm's abnormal return is measured for 180 days from the closing market price on its first day of trading. I adjust each IPO firm's gross returns for its size and risk using its Fama-French 10x10 portfolio formed on its market value of equity and book-to-market ratio. High (Low) *Performance* firms include those with values greater than 4 (less than 2). The mean return on the 'High – Low' portfolio is equal to the weighted average of a portfolio that is long (short) firms with high (low) values of *Performance*. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 6. *Performance* and Post-IPO Stock Returns, Continued

Panel B: Determinants of *BHAR*

Variables	Predicted Sign	*BHAR* (1)	(2)
Performance	+	0.0336***	0.0259*
		(2.83)	(1.96)
CRSP	+		0.8770***
			(2.81)
BM	+		0.1165**
			(2.07)
Secondary	+		0.0138
			(0.44)
Tot_Revision	-		-0.0238
			(-0.44)
EBIT	+		0.0004*
			(1.67)
Underwriter	+		0.0240**
			(2.18)
Filing_Amount	?		-0.0003**
			(-2.00)
Observations		510	510
R-squared		0.0188	0.0669

Notes: This panel reports pooled OLS regressions where the dependent variable is the buy-and-hold abnormal returns (*BHAR*) measured for 180 days from the closing market price on firms' first day of trading on the secondary market. *Performance* is the primary variable of interest for this table. All variables are motivated in Section 3 and are defined in Appendix A. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 7. The Differential Impact of *Performance* on Post-IPO Stock Returns

Panel A: *Performance*-based Trading Strategy by Investor Sophistication

	High Info Processing				Low Info Processing			
	n	Mean	Median	Positive	n	Mean	Median	Positive
Sample	352	0.007	-0.039	0.449	158	-0.059	-0.085	0.354
Low *Performance*	28	-0.021	-0.188	0.286	26	-0.119	-0.142	0.192
High *Performance*	132	0.036	-0.007	0.477	48	0.099	0.090	0.563
= High - Low	160	0.033	0.018	0.513	74	0.106	0.114	0.635
t-statistic	-	1.226	0.977	-	-	2.381**	2.524**	-

Notes: This panel reports the average buy-and-hold abnormal returns (*BHAR*) earned from portfolios of IPO firms based on values of *Performance*. The results are partitioned by whether the offering was facilitated by a top-tier underwriter. High (Low) Info Processing indicates that the average updated Carter Manaster ranking for the lead underwriters facilitating the offering is greater than (less than) 8. High (Low) *Performance* firms include those with values greater than 4 (less than 2). The mean return on the 'High – Low' portfolio is equal to the weighted average of a portfolio that is long (short) firms with high (low) values of *Performance*. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 7. The Differential Impact of *Performance* on Post-IPO Stock Returns, Continued

Panel B: The Differential Impact of Performance on Secondary Market Abnormal Returns by Investor Sophistication

		BHAR			
Variables	Predicted Sign	(1) High Info Processing	(2) Low Info Processing	(3) High Info Processing	(4) Low Info Processing
Performance		0.0189	0.0527***	0.0181	0.0452**
		(1.45)	(3.23)	(1.23)	(2.15)
Difference of $\beta_{Performance}$ =High - Low Info Processing	–	t-statistic: -1.97**		t-statistic: -1.38	
Remaining Controls		Excluded	Excluded	Included	Included
Observations		352	158	352	158
Adjusted R-Squared		0.0034	0.0491	0.0209	0.1811

Notes: This panel reports the average buy-and-hold abnormal returns (*BHAR*) earned from portfolios of IPO firms based on values of *Performance*. The OLS regressions are partitioned by whether or not a top-tier underwriter facilitated the offering. High (Low) Info Processing indicates that the average updated Carter Manaster ranking for the lead underwriters facilitating the offering is greater than (less than) 8. The difference between the coefficient estimated for the *Performance* variable for the High Information Processing partition and the coefficient estimated for the *Performance* variable for the Low Information Processing partition is the primary variable of interest for this table and is predicted to be negative. All variables are motivated in Section 3 and are defined in Appendix A. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 8. Alternative Measures of *Performance*

Variables	*Public*	*Range*	*Revision*	*Init_Return*	*Tot_Revision*	*Initial*	*Offer*	*Secondary*	*BHAR*
Performance $_1$	0.1737***	0.1787***	0.0327***	0.0220***	0.0611***	0.0194	0.0427**	0.0621**	0.0271*
	(3.94)	(5.06)	(4.83)	(3.16)	(5.56)	(1.02)	(2.14)	(2.62)	(1.76)
Performance $_2$	0.1773***	0.1721***	0.0334***	0.0232***	0.0618***	0.0079	0.0354*	0.0578**	0.0301*
	(3.86)	(5.10)	(4.86)	(3.28)	(5.33)	(0.38)	(1.66)	(2.34)	(1.97)
Performance $_3$	0.1537***	0.1618***	0.0334***	0.0205***	0.0600***	0.0154	0.0424**	0.0642***	0.0288**
	(3.24)	(4.75)	(5.04)	(3.00)	(5.47)	(0.80)	(2.11)	(2.85)	(2.02)
Performance $_4$	0.1393***	0.1599***	0.0324***	0.0272***	0.0674***	0.0212	0.0441**	0.0665***	0.0235*
	(2.61)	(4.19)	(4.45)	(3.82)	(5.31)	(1.00)	(2.05)	(2.79)	(1.67)
Performance $_5$	0.1534***	0.1915***	0.0402***	0.0370***	0.0859***	0.0245	0.0565***	0.0891***	0.0358**
	(2.86)	(5.22)	(5.56)	(4.82)	(6.98)	(1.24)	(2.71)	(3.70)	(2.57)
Performance $_6$	0.1492***	0.1807***	0.0344***	0.0261***	0.0686***	0.0141	0.0379*	0.0595**	0.0369***
	(2.76)	(4.55)	(4.80)	(3.91)	(5.82)	(0.70)	(1.84)	(2.52)	(2.62)
Performance $_7$	0.0210***	0.0225***	0.0046***	0.0042***	0.0098***	0.0072***	0.0109***	0.0150***	0.0055**
	(2.79)	(3.92)	(4.34)	(3.20)	(5.21)	(2.37)	(3.57)	(4.34)	(2.52)
Performance $_8$	0.0003***	0.0003***	0.0001***	0.0001***	0.0001***	0.0001**	0.0001***	0.0002***	0.0001**
	(2.79)	(4.17)	(4.71)	(3.24)	(5.42)	(2.31)	(3.50)	(4.12)	(2.31)
Remaining Controls	Included	Included	Included	Included	Included	Included	Included	Included	Included
Underwriter Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Excluded
Year Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Excluded
Observations	698	698	510	510	510	510	510	510	510

Notes: This panel reports the estimated coefficients from running Equations 1,2, and 4 using eight alternative measures of the *Performance* variable. Each measure uses an alternative combination of the six fundamental signals included in the original Performance variable. Specifically, the measures are computed as follows: *Performance*$_1$ = *Performance - Δ AT; Performance*$_2$ = *Performance - Δ Lev; Performance*$_3$ = *Performance - Δ PP&E; Performance*$_4$ = *Performance - Δ CFO; Performance*$_5$ = *Performance - Δ GM;* and *Performance*$_6$ = *Performance - Δ EBIT*. The final two alternative measures are built to allow for variation in the individual fundamental signals. Specifically, *Performance*$_7$ assigns values to each firm based on the realization of its fundamental signals in comparison to the prior year's decile cutoffs. It then sums these decile rankings to form the aggregate performance measure. *Performance*$_8$ ranks the continuous realization for each fundamental signal for the entire cross section of firms (ranks 1-698) and sums the ranks together to form the aggregate measure. Each of the coefficients estimated using these eight alternative measures is predicted to be positive for all nine dependent variables examined in this paper. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 9. The Reputational Effects of Marketing Overpriced Securities

Panel A. Descriptive Statistics

	Full Sample					
Variables	N	Mean	Std. Dev	Q1	Median	Q3
Δ_*Mkt_Share_Count*	511	0.00	0.04	-0.01	0.00	0.01
Δ_*Mkt_Share_Amount*	511	0.01	0.06	0.00	0.00	0.01
Public_Rep	511	0.74	0.36	0.63	1.00	1.00
Range_Rep	511	1.41	0.78	1.00	1.61	2.00
Revision_Rep	511	-0.03	0.12	-0.06	0.00	0.00
Init_Return_Rep	511	0.07	0.12	0.00	0.02	0.11

Notes: This panel reports descriptive statistics for variables used to examine the reputational effects of certifying prices in excess of the final offer price as described in Section 6.1. This sample consists of IPOs of U.S. industrials filed with the SEC from 2001 – 2011. My sample is obtained from the Global New Issues Database within Thomson Financial's SDC Platinum and excludes unit offers, ADRs, carve-outs/spin-offs, reverse LBOs, partnerships, financial firms (SIC code 6000-6999), and filings of less than $10 million. All variables are motivated in Section 6.1 and are defined in Appendix A.

Table 9. The Reputational Effects of Marketing Overpriced Securities, Continued

Panel B. Reputational Effects of Marketing Overpriced Securities

Variables	Predicted Sign	*Δ_Mkt_Share_Count*			*Δ_Mkt_Share_Amount*		
		(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Public_Rep	+	0.0124***			0.0097*		
		(3.30)			(1.80)		
Range_Rep	+		0.0088***			0.0074***	
			(4.73)			(2.92)	
Revision_Rep	+			0.0466***			0.0408**
				(3.57)			(2.52)
Init_Return_Rep	-	-0.0152	-0.0246*	-0.0216*	-0.0158	-0.0240	-0.0219
		(-1.22)	(-1.89)	(-1.65)	(-1.01)	(-1.46)	(-1.32)
Year Fixed Effects		Included	Included	Included	Included	Included	Included
Observations		511	511	511	511	511	511
R-squared		0.001	0.012	0.006	0.004	0.008	0.007

Notes: This panel reports pooled OLS regressions using two different dependent variables that are designed to capture the changes in an underwriter's annual market share. *Public_Rep, Range_Rep,* and *Revision_Rep* are the primary variables of interest in this table and are each predicted to be positive. All variables are motivated in Section 6.1 and are defined in Appendix A. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Table 10. *Performance* and the Partial Adjustment Phenomenon

Variables	Predicted Sign	*Init_Return* (1)	Predicted Sign	*Init_Return* (2)
*Performance * Revision_Pos*			+	0.0260**
				(2.45)
Performance	+	0.0163***	?	0.0025
		(2.78)		(0.34)
Revision_Pos	+	0.1309***	+	0.0331
		(5.90)		(0.70)
Remaining Control Variables		Included		Included
Underwriter Fixed Effects		Included		Included
Year Fixed Effects		Included		Included
Observations		510		510
Adjusted R-Squared		0.2034		0.2105

Notes: This panel reports pooled OLS regressions examining firms' initial returns (*Init_Return*). The variable of interest is the interaction of *Performance* and *Revision_Pos* which is predicted to be positive. All variables are motivated in Section 6.2 and are defined in Appendix A. *, **, *** indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Appendices

Appendix A: Measurement of Variables[32]

Δ AT: An indicator variable that takes the value of 1 if the issuer's asset turnover ratio (AT) increased year-over-year during the two years preceding the firm's IPO. A firm's asset turnover ratio is calculated as its annual revenues divided by its two-year average assets.

Δ CFO: An indicator variable that takes the value of 1 if the issuer's cash flow from operations (CFO) increased year-over-year during the two years preceding the firm's IPO.

Δ EBIT: An indicator variable that takes the value of 1 if the issuer's earnings before income and taxes (EBIT) increased year-over-year during the two years preceding the firm's IPO.

Δ GM: An indicator variable that takes the value of 1 if the issuer's gross margin ratio (GM) increased year-over-year during the two years preceding the firm's IPO. A firm's gross margin ratio is calculated as its annual revenues minus its cost of goods sold all divided by its annual revenues.

Δ LEV: An indicator variable that takes the value of 1 if the issuer's leverage (LEV) decreased during the two years prior to the IPO. A firm's leverage is calculated as the sum of its total liabilities and its carrying value of preferred stock all divided by its total assets.

Δ PP&E: An indicator variable that takes the value of 1 if the issuer's net property, plant, and equipment (PP&E) assets increased year-over-year during the two years preceding the firm's IPO.

Δ_Mkt_Share_Amount: The percentage change in the dollar amount of the offerings facilitated by underwriter *i* in year *t+1* relative to year t.

Δ_Mkt_Share_Count: The percentage change in the number of offerings facilitated by underwriter *i* in year *t+1* relative to year t..

Abs*(EBIT)*: The natural log of one plus the absolute value of the firm's earnings before interest and taxes (EBIT) for the fiscal year prior to IPO.

[32] As motivated in Sections 3.2.3 and 3.2.4, I use a log transformation process to many of the variables included in the study. This transformation consists of taking the log of (1+value) for all positive values and the –log (1-value) for negative values. This process is used to retain the negative values included in the original data while also maintaining the monotonic relationship that exists among the realized values.

Auditor: An indicator variable that takes the value of one if the issuer's prior year financial statements were audited by either Arthur Anderson, Deloitte Touché, Ernst & Young, KPMG, or PriceWaterhouseCoopers.

BHAR: The firm's buy-and-hold returns for 180 calendar days from the end of a firm's first day of trading on the secondary market less the buy-and-hold return of the firm's Fama-French 10x10 portfolio over this same time period. The Fama-French 10x10 portfolio is designed to adjust for abnormal returns associated with firm size (market value of equity) and risk (book to market ratio).

BM: The firm's book-to-market ratio calculated immediately following its IPO. This is calculated as *Book_Value_Post* divided by *Secondary*.

Book_Value: The log transformation the firm's book value prior to IPO. The firm's book value prior to IPO is calculated as the firm's total assets minus the sum of its total liabilities and the carrying value of its preferred stock.

Book_Value_Post: The log transformation of the firm's book value following its IPO. The firm's book value following its IPO is calculated as the sum of its total assets and IPO proceeds minus the sum of its total liabilities and the carrying value of its preferred stock.

CFO: The log transformation of the firm's cash flow from operations (CFO) for the fiscal year prior to IPO.

CRSP: The CRSP value-weighted return measured for 180 days after each firm's first day of trading on the secondary market.

EBIT: The log transformation of the firm's earnings before interest and taxes (EBIT) for the fiscal year prior to IPO.

Filing_Amount: The natural log of one plus the amount of proceeds (in millions) raised from the IPO.

Init_Return: The percentage change in price at the end of the first day of trading on the secondary market and the final offer price.

Init_Return_Rep: The average initial return of underwriter *i*'s offerings over the previous two-year period.

Initial: The natural log of one plus the firm's total market value calculated as the number of post-IPO shares multiplied by the price proposed for the IPO.

Insider: The percentage of post-IPO shares held by the firm's executives and directors.

IPO_Price: The amount of proceeds received by an IPO firm for each of its securities.

Leverage: The firm's leverage ratio calculated as the sum of its total liabilities and the carrying value of its preferred stock all divided by its total assets. All values are taken from the fiscal year prior to IPO.

Mid_Price: The middle point of the initial pricing range provided in the issuer's registration statement filed with the SEC.

Mkt_Comp: The percentage of the total IPOs that were successfully completed between the day that the firm filed its initial registration statement with the SEC and the IPO date.

Mkt_Ret: The CRSP value-weighted return for the period between the date that the firm files its initial registration statement with the SEC and the IPO date.

Offer: The natural log of one plus the firm's total market value calculated as the number of post-IPO shares multiplied by the final offer price.

Performance: A composite score variable that sums the values of the following six binary signals: is a composite score variable that sums the values of Δ *CFO*, Δ *EBIT*, Δ *GM*, Δ *AT*, Δ *PP&E*, and Δ *LEV*.

Public: An indicator variable that takes the value of 1 if a firm's offering is successfully completed, 0 otherwise.

Public_Rep: The percentage of underwriter i's offerings that have been successfully completed over the previous two-year period.

Range: An ordinal variable that takes the value of 0 to firms that withdraw their offering, 1 to firms that price below the initial range, 2 to firms that price within the initial range, and 3 to firms that price above the initial range.

Range_Rep: The average pricing outcome (*Range*) of underwriter *i*'s offerings relative to the proposed pricing range over the previous two-year period.

R&D: The natural log of one plus the firm's annual research and development expense (R&D) for the fiscal year prior to IPO.

Revenues: The natural log of one plus the firm's annual revenues for the fiscal year prior to IPO.

Revision: The percentage change in price between the final offer price and the midpoint of the initial pricing range.

Revision_Pos: An indicator variable that takes the value of one if a firm's price revision (*Revision*) is non-negative.

Risk_Factors: The natural log of one plus the number of risk factors included in the issuer's initial registration statement that it filed with the SEC.

Secondary: The natural log of one plus the firm's total market value calculated as the number of post-IPO shares multiplied by the closing price on the firm's first day of trading.

Tot_Revision: The percentage change in price between the price at the end of the first day of trading on the secondary market and the midpoint of the initial pricing range.

Underwriter: The average Carter-Manaster underwriter reputation, obtained from Jay Ritter's data library, for the lead underwriters in the year of IPO.

Appendix B: The Underwriter Selection Process

The purpose of this appendix is to provide a description of the underwriter selection process which is commonly referred to as the "IPO bake-off". The competitiveness of this process is suggested to lead underwriters to commit to marketing IPO firms at excessively high valuations. While the IPO bake-off is not publicly observable, this appendix provides commentary about this process and the competitive pressure that exists therein.

Dwyer, R. (2012). Brazil: Time to go back to IPO textbook? *Euromoney* March, 2012. Web. May 6, 2014.

> The temptation, they say, for one bank to high-ball the valuation to win the mandate is irresistible. It's a symptom of an over-banked market, say some, who think rationalization would help. There are too many banks chasing the same deals and, during the bake-off, how better to differentiate yourself with the client than to say: "You should get P + 10%"?

Turner, G. (2012). Independent advisors remain on watch during IPOs. *Financial News* October 8, 2012. Web. May 6, 2014.

> Companies and their advising banks have one figure in mind and then blame the state of the market when selling the shares to picky investors at a much lower price.
>
> Announcing that it had pulled its IPO in mid-September, Talanx said: "Investor feedback on the company's valuation deviated significantly from the estimated minimum fair value that had been communicated to Talanx by the investment banks managing the transaction."

Tuttle, K. (2011). Investment banking is not investment research. *Research 2.0* October, 18, 2011. Web. May 6, 2014.

> At [the bake-off], a company like Groupon invites all the banks to come and do a dog and pony show with the senior management team to prove how valuable they would be as an underwriter. They are not in evaluation mode, they are in selling mode. Much like a courtship, the banks are invited by the company to "show how much they love them." Only one suitor gets to be the lead bank (although in large deals there can be two or three)…A key part of the process is where banks provide a "valuation estimate" for where the shares should be priced and expect to trade. This is the most absurd part of the process because the banks all try and find the highest number.

Sorkin, A. R. (2011). The missed red flags on Groupon. *New York Times* October 17, 2011. Web. May 6, 2014.

> If it were to really slow its marketing spending, it is possible Groupon could turn a profit. Even so, it does not fully explain how Groupon's underwriters, whose endorsement of the company is supposed to be considered the Good Housekeeping Seal of Approval, originally came up with Groupon's questionable $30 billion valuation.

Useem, J. (1998). All dressed up and No IPO. *Inc.* February, 1, 1998. Web. May 6, 2014.

> Robertson Stephens was "less enthusiastic" than Goldman about the valuation. But Robertson Stephens may have been reluctant to express hesitation, given that a number of other investment banks were trying to get in on the potentially remunerative deal, and Robertson may have risked losing its exclusive position as the deal's co-manager.

Hughes, A. (2013). Union forces Chrysler towards IPO. *International Financing Review* October, 23 2013. Web. May 6, 2014.

> The choice of JP Morgan as sole bookrunner on the IPO is controversial as rival bankers claim that [JP Morgan] proposed the lowest valuation during pitching. "It's perverse. The whole thing is a charade," said one industrial banker of the IPO bake-off. "In a normal world, it wouldn't make sense to go after a low valuation."

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