Uncertainty, prospectus content, and price updates prior to initial public offerings[*]

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Abstract

This study investigates how information gets incorporated into initial public offering (IPO) share prices. We find that greater uncertainty about the value of a firm's shares is associated with a more conservative anticipated price range and more content concerning efforts to exploit growth opportunities in the offering prospectus. The amount of content related to growth opportunities is positively related to the change in the share price between the initial announcement of the anticipated price range and the IPO (the *IPO price update*), suggesting that potential investors help incorporate the value of growth option related content into the IPO price through the book-building process. However, not all of the relevant information is reflected in IPO prices. The *IPO price update* is also positively related to the first day return on the shares in public trading, suggesting that IPO prices are set low to compensate investors for their price discovery efforts.

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1. Introduction

Underpricing occurs in an initial public offering (IPO) in part because issuing firm managers and underwriters do not know the precise value of the shares being sold. Since the sale of undervalued shares results in a wealth transfer from existing to new shareholders, firm managers have an incentive to limit underpricing. This can be accomplished through more thorough due diligence on the part of managers and underwriters and through careful management of the book-building process. As Hanley and Hoberg (2010) note, the extent to which each of these mechanisms is utilized depends on their relative costs and benefits.

The literature generally treats due diligence and book-building as distinct means of obtaining a more accurate share price. With due diligence, managers and underwriters are assumed to collect value-relevant information and set the anticipated share price to reflect this information. Book-building activities are assumed to be managed in a way that encourages informed investors to reveal the price implications of their private information so that the price at which the shares are ultimately sold in the IPO reflects this information (Benveniste and Spindt, 1989; Sherman and Titman, 2002; Chiang, Qian, and Sherman, 2009).

However, due diligence activities and book-building are not independent. If investors are better qualified to assess the value implications of certain types of information, as suggested by Benveniste and Spindt (1989), it can be beneficial for managers and underwriters to collect these types of information in the course of IPO due diligence activities and to then make this information available to investors so that it is better reflected in the IPO offer price.

We find evidence consistent with this theory in a sample of 2,254 IPOs that were completed between 1996 and 2013. This evidence indicates that information is included in IPO

prospectuses that is not reflected in the initial anticipated price range, but that is subsequently incorporated into prices during the book-building process. Furthermore, the amount of such information in prospectuses is positively related to measures of firm growth opportunities, which we use as proxies for share price uncertainty. When the value of a firm's growth opportunities represents a greater proportion of its share value, we expect that more information will be included in that firm's IPO prospectus to help investors assess the value of these opportunities.

The key evidence from our study is as follows. First, greater uncertainty with respect to share value, as reflected in growth opportunity measures, is positively related to the change in the share price between the announcement of the anticipated price range and the IPO (*IPO price update*). This suggests that the anticipated price range is more conservatively set when there is greater uncertainty and that the value implications of growth options are better incorporated into share prices during the book-building process. The evidence is consistent for the five different measures of firm growth opportunities that we consider, including the firm's sales growth rate, R&D expenditures, growth opportunities implied by a dividend discount model, Tobin's q, and a measure of the amount of capital raised in the IPO from Hertzel, Huson, and Parrino (2012).

Second, consistent with the idea that more value-relevant content is included in IPO prospectuses when there is greater uncertainty about share value on the part of managers and underwriters, we find that more such content is included in prospectuses when there is greater uncertainty. The content that we focus on in the IPO prospectuses is that which is related to firm efforts in marketing, brand, sales, channel, and customer management, as well as advertising. We label this information *marketing content* and focus on it for two reasons. First, this content is directly related to efforts by firm managers to exploit growth opportunities and should therefore inform investors about firm prospects with regards to such opportunities. Second, evaluating the value implications of such efforts requires making judgements about a firm's customers and

competitors. These are judgements for which outside investors might have a comparative advantage. In this sense, disclosures regarding *marketing content* are similar to the information disclosures modeled in Boot and Thakor (2001), who demonstrate that disclosures by firm managers increase the incentives for skilled investors to acquire complementary information. The evidence from our study is that the growth opportunity measures are positively related to the amount of *marketing content* in IPO prospectuses.

Third, *marketing content* is positively related to the *IPO price update*, which is consistent with both the idea that the initial anticipated price range tends to be conservative when there is greater uncertainty and that investors help assess the value implications of growth opportunities during the book-building process.

Finally, the *IPO price update* is positively related to the first day return in public trading, suggesting that while the value implications of *marketing content* are better reflected in the IPO price than in the initial anticipated price range, shares are still priced low in the IPO to compensate investors for their price discovery efforts.

This study adds to our understanding of the ways in which due diligence activities affect IPO pricing and the value implications of disclosures in IPO prospectuses. Hanley and Hoberg (2010) present evidence consistent with the theory that more information collected through due diligence activities results in more accurate anticipated price range estimates and that information is disclosed in prospectuses to provide credibility for these estimates. The evidence in our study indicates that not all of the information that is collected in the due diligence process is accurately reflected in the initial anticipated price range or included in the IPO prospectus solely for credibility. Some of this information is included in the prospectus so that potential investors can help assess its value during the book-building process. This interaction between due diligence activities and book-building has received little attention in the literature.

The evidence in our study is also related to evidence in the literature on the interaction between marketing strategy and financing activities. Chemmanur and Yan (2009) and Lou (2008) find that firms increase advertising prior to an IPO and that excess advertising spending is negatively related to IPO underpricing. Saboo and Grewal (2013) find that information in the IPO prospectus that concerns a firm's customer and competitor orientation is positively related to IPO underpricing. Our evidence suggests that much of the reaction to a firm's disclosure of *marketing content* precedes the offering, and induces information gathering in the book-building process. These other studies do not inform us about the extent to which this occurs.

The rest of the paper is organized as follows. Section 2 discusses our theory of how information collected during IPO due diligence activities gets incorporated into share prices during the book-building process. Section 3 then describes the sample used in the empirical analysis and the key empirical measures. Section 4 presents the empirical evidence and Section 5 concludes.

2. Theory

The IPO literature suggests that underpricing occurs because issuing firm managers and underwriters do not know the precise values of the shares being offered and also because managers and underwriters purposely price the shares below their estimated values (Rock, 1986; Beatty and Ritter, 1986; Ritter and Welch, 2002). Managers and underwriters have a financial incentive to limit the underpricing that is attributable to uncertainty about the true value of the shares. This can be done through due diligence (Hanley and Hoberg, 2010) and through the book-building process (Benveniste and Spindt, 1989; Sherman and Titman, 2002; Chiang, Qian, and Sherman, 2009).

Most of the literature in this area has focused on how the book-building process is used to entice informed investors to reveal private information so that it is reflected in the offer price. The theory assumes that some potential investors are better informed than managers and underwriters about share values and that investors in general can more credibly convey information about firm prospects than management. Under either of these assumptions, underwriters can use the share allocation process to help get private information incorporated into the offer price.

In contrast to the book-building literature, which focuses on activities after the initial IPO prospectus is filed with the Securities and Exchange Commission (SEC), Hanley and Hoberg (2010) examine due diligence activities before the initial IPO prospectus is filed. Prior to 2010, due diligence activities had not received much attention in the literature, other than that from Kim and Ritter (1999) and Lowry and Schwert (2004). Hanley and Hoberg (2010) propose that when managers and underwriters engage in more rigorous due diligence activities, they incorporate the information they gather into the anticipated price range that is reported in the initial IPO prospectus (the initial valuation).[1] Hanley and Hoberg argue that the information gathered through due diligence must be disclosed in the IPO prospectus and during the ensuing road show if investors are to believe the initial valuation. In other words, this information is disclosed to provide credibility for the initial valuation.

An empirical implication of Hanley and Hoberg's theory is that the initial valuation of the shares being offered in an IPO, typically measured as the midpoint of the anticipated price range, will better reflect the true value of the shares when the pre-filing due diligence process is more

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[1]In the majority of cases, the anticipated price range is not reported in the first IPO prospectus filed with the SEC, but rather, is reported in a subsequent filing. However, the prospectus that contains the anticipated price range is generally filed before the beginning of the book-building process. We refer to the first prospectus which lists the anticipated price range as the "initial prospectus", regardless of whether it was the first version of the prospectus filed with the SEC.

rigorous. Since a rigorous process will also necessarily lead to greater disclosure in the initial IPO prospectus and during the ensuing road show, greater disclosure in the prospectus should be associated with a smaller update to the price of the shares between the filing of the first IPO prospectus with an anticipated price range and the IPO itself. Consistent with this prediction, Hanley and Holberg observe a negative relation between a measure of non-standard disclosures in prospectuses and the *IPO price update*.

The evidence reported by Hanley and Holberg notwithstanding, it is not obvious that we should expect all of the value-relevant information collected during the due diligence process to be incorporated into the anticipated price range or that the non-standard disclosures in the initial IPO prospectus are included only for credibility purposes. Other researchers have proposed that some investors can have a comparative advantage in determining the value implications of information which requires a deep understanding of the competitive environment facing the firm. This might include, for example, the strategies and responses of competitors to firm decisions (see, for example, Benveniste and Spindt, 1989).

The model described by Boot and Thakor (2001) suggests that disclosures that complement the information available to skilled investors can increase the gains from becoming informed and provide incentives for more information gathering. If this is true, managers and underwriters might report certain types of information in the initial IPO prospectus and in road show meetings with the expectation that investors will help assess the value implications of this information. This is not to say that some information gathered through due diligence efforts will not be reflected in the anticipated price range. Some of it will be, but not all of it.

To the extent that managers and underwriters are uncertain about the value implications of information that has been collected in the due diligence process, they have an incentive to make this information public where they believe that investors can more accurately value it and

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are likely to value it positively. Managers and underwriters are likely to set the anticipated price range low when relying on investors to help assess information gathered during due diligence because of concerns that a negative change in price may lead the offering to be canceled (Edelen and Kadlec, 2005) or to signal to investors that their efforts are more likely to be rewarded with an allocation of underpriced shares (Benveniste and Spindt, 1989; Sherman and Titman, 2002). This suggests that certain types of value-relevant information in initial IPO prospectuses will be incorporated into share prices after those prospectuses are filed and that we should expect that price updates will be positively related to the extent that such information is disclosed in initial IPO prospectuses.

Our theory maintains that the private information possessed by investors is augmented by information which is gathered and disseminated by managers and underwriters in the initial IPO prospectus. In certain circumstances it makes economic sense for managers and underwriters to disseminate information from due diligence activities when investors have a comparative advantage in processing it. The benefits from doing this can more than offset the costs associated with using the book-building process to obtain a better value estimate for the shares that will be sold.

The question of how price updates between the filing of initial IPO prospectuses and the associated IPO offerings are related to disclosures in those prospectuses is ultimately an empirical one. The answer depends on the relative extent to which new information in the prospectuses is provided to enhance credibility or to help investors better assess value. It also depends on the ability of managers and underwriters to accurately incorporate information from due diligence activities into share price estimates.

3. Sample and key empirical measures

In this section we describe the construction of the sample and the key variables used in the empirical analysis.

3.1. Sample construction

We construct the sample by first obtaining a list of all firms that completed an IPO between January 1, 1996 and December 31, 2013 from the ThomsonOne new issues database. Following Lowry and Schwert (2004), we exclude American depository receipts (ADRs), unit issues, real estate investment trusts (REITs), closed-end funds, and financial firms from the sample. We then match the sample with the Standard and Poor's Compustat database to obtain each firm's financial information prior to the IPO and The Center for Research in Security Prices (CRSP) database to obtain stock return data. Finally, we determine the year in which the issuing firm was founded from the Field-Ritter data set of Loughran and Ritter (2004).[2] A total of 2,518 issuing firms are in all of these databases.

For each of these 2,518 firms, we search the SEC Edgar database to identify the first prospectus which lists an anticipated price range for its IPO.[3] Firms typically file a prospectus with the SEC and then at least one follow-up prospectus in response to requests for additional disclosure by SEC staff. In most cases the anticipated price range for the offering is disclosed in a follow-up prospectus that is filed before the beginning of the road show (Schultheis, 2004). For example, over the 2009 to 2013 period, the anticipated price range is reported in the first prospectus by only 23 percent of our sample firms. We refer to the first prospectus in which an anticipated price range is reported as the initial IPO prospectus because it is the first prospectus that contains both the value estimate produced by management and the underwriter and

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[2]We thank Jay Ritter for generously providing the database of IPO founding dates on his website.

[3]Prospectuses are submitted to the SEC as form 424b or S-1 filings. We search through both types of filings preceding the IPO.

information relevant to an assessment of the validity of that estimate.

We are able to locate the initial IPO prospectus for 2,254 of the 2,518 firms. Sixty five percent of the 2,254 firms are from technology intensive industries, including biotechnology (18 percent), communications (19 percent), computers (22 percent) and electronics (6 percent).

The first prospectus containing an anticipated price range is filed an average of 44 days before the IPO. Because the anticipated price rage is typically disclosed before the book-building process begins, it reflects the information about the issuer that was produced by management and the underwriter in their due diligence activities, but does not include information produced by investors during the road show (Kim and Ritter, 1999).

3.2. Variables

The key variable of interest in our analysis is the *IPO price update*. As in Hanley (1993), we calculate this variable as the price at which the sample firm's shares are sold in the IPO less the midpoint of the anticipated price range disclosed in the initial IPO prospectus, divided by the midpoint of the anticipated price range.

The *IPO price update* reflects the incorporation of information that is obtained through the book-building process and new value-relevant information that becomes available about the firm during the period between the filing of the initial IPO prospectus and the IPO. In our analysis we are interested in determining how information disclosed by the firm in the initial IPO prospectus affects the *IPO price update* through the book-building process. To do this we construct variables that 1) are likely to proxy for the sensitivity of the IPO price to information disclosure, 2) measure the extent of information disclosure in the initial IPO prospectus, and 3) control for other firm, issue, and market characteristics.

3.2.1. Sensitivity of IPO price to information disclosure

Our theory suggests that that information included in the initial IPO prospectus will have a greater impact on the *IPO price update* through the book-building process when there is more uncertainty on the part of the managers and underwriters about the value implications of that information. For a typical firm that completes an IPO, uncertainty about future growth prospects is likely to be a major source of uncertainty about the value of its shares. To the extent that *marketing content* included in initial IPO prospectuses is informing investors about the firms' growth opportunities, we would expect that firms with greater uncertainty about their growth opportunities will include more *marketing content* in their prospectuses and that this content will be more strongly related to the *IPO price update*. To investigate the impact of uncertainty about growth prospects we use five measures of such uncertainty in the empirical analysis, including *sales growth rate*, *R&D expenditures*, *implied growth opportunities*, *Tobin's q*, and *months of capital with IPO funds*.

Sales growth rate: We compute *sales growth rate* as the annualized growth rate for a sample firm over the two year period which begins in the fiscal year that ends immediately before the IPO (e.g., from t-1 through t+1, where t is the year in which the IPO takes place). In using this variable in the subsequent analysis, we assume that the relative rate of sales growth during these two years is indicative of the relative level of the growth opportunities associated with that firm.

R&D expenditures: We measure *R&D expenditures* as the industry-adjusted ratio of R&D expenditures in the fiscal year before the year in which the IPO takes place divided by book assets at the end of that year. The industry adjustment is accomplished by subtracting the median value of R&D expenditures divided by book assets for all firms in the same two-digit SIC industry as the sample firm. In these calculations we assume that a firm has no R&D

expenditures when Compustat identifies R&D expenditures as a missing variable.

Implied growth opportunities: This measure reflects an estimate of the percentage of the market capitalization of each sample firm that is attributable to growth opportunities. It is computed as the difference between the value of a firm's equity that is implied by its IPO price and the present value of its earnings divided by the value of the firm's equity.

$$\text{Implied growth opportunities} = \frac{\left(\text{IPO price} \times \text{Total shares}\right) - \dfrac{\text{Net income}}{\text{Cost of equity}}}{\text{IPO price} \times \text{Total shares}}$$

$$= \frac{\text{Present value of growth opportunities}}{\text{IPO price} \times \text{Total shares}}$$

In this calculation we use net income from the year in which the IPO takes place and assume a cost of equity equal to 10 percent. The market capitalization reflects the number of shares outstanding after the IPO. For firms with negative net income, *implied growth opportunities* is set to 1.0.

Tobin's q: This variable is estimated as of the end of the fiscal year in which the IPO takes place. The calculation is as follows:

Tobin's q = [book assets – common equity book value
+ (common shares outstanding × common share price)]/book assets].

Months of capital with IPO funds: This is a general measure of uncertainty about sample firm prospects that equals the number of months that management expects the net IPO proceeds to last. In their study of the staging of capital in the public equity markets, Hertzel, Huson, and Parrino (2012) report evidence consistent with the theory that there is a negative relation between the overall uncertainty about a firm's prospects and *months of capital with IPO funds*.

3.2.2. Information disclosure

We obtain a measure of the extent of information disclosure in the initial IPO prospectus from an analysis of the disclosures in that prospectus that are related to firm efforts in marketing, brand, sales, channel, and customer management, as well as advertising. We focus on this *marketing content* because it is directly related to a firm's growth opportunities and is therefore likely to me especially difficult to value.[4] Accurately determining the value implications of information related to growth opportunities requires knowledge of complex environmental factors, including macroeconomic conditions and the competitive environment faced by the firm, in addition to an understanding of firm characteristics and strategy.

Informed investors are likely to have knowledge about the value implications of growth opportunities that managers and underwriters do not have and, therefore, *marketing content* is likely to be included in the initial IPO prospectus with the expectation that the information it conveys will be more fully priced in the book-building process.

To construct the *marketing content* measure, we first compile a dictionary containing words and phrases that are likely to refer to a firm's activities related to marketing, brand, sales, channels, and customer management, as well as advertising. We do not use words related to 'pricing' as our review of the prospectuses indicates that words related to pricing are most frequently used in the context of pricing the issue and not in the context of pricing of the firm's goods and services. Appendix A lists the words that we include in the dictionary.

While any coding scheme for content analyses of text inherently involves some subjectivity, we mitigate these concerns by restricting the words in our dictionary to those for

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[4] We use the label *marketing content* because this content is broadly consistent with the definition of marketing that has been adopted by the American Marketing Association. They define marketing as follows: "Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large." Retrieved from https://www.ama.org/AboutAMA/Pages/Definition-of-Marketing.aspx.

which there is a general consensus that they belong in such a dictionary (see, for example, Krippendorff, 2004). We measure *marketing content* as the number of occurrences of words from the marketing dictionary divided by the total number of words in the text, excluding headings, tables, and figures.

We separately measure *marketing content* in the entire initial IPO prospectus, the prospectus summary, and the management discussion and analysis (MD&A), business, and risk factors sections. Appendix A shows that a small number of words from the *marketing content* dictionary occur much more frequently than the others. For example, five words (distribution, customers, marketing, customer, and advertising) account for 69.1 percent of the words and phrases from the dictionary that we observe in the 2,254 prospectuses. These are also the five most common words from the dictionary in the three sections of the prospectus that we examine separately and four of these five words are among the five most common words in the prospectus summary.

As examples of the nature of the discussions reflected in the *marketing content*, consider the following two sentences from the Actuate Software Corporation prospectus (Form S-1, filed on 6/23/1998): "…a significant element of the Company's strategy is to embed its technology in products offered by enterprise application vendors for resale to such vendors' customers and end users." and "The Company has spent, and intends to continue spending, considerable resources educating potential customers and indirect channel partners about enterprise reporting and the Company's products."

Table 1 presents statistics for *marketing content* for the total prospectus, the prospectus summary, and the three sections that we consider separately. The mean (median) total number of words in an entire prospectus in our sample is 59,682 (48,791), while the mean (median) *marketing content* is 0.52 percent (0.47 percent). By comparison, the mean (median) *marketing*

content in the prospectus summary and the MD&A, business, and risk factors sections are 1.21 percent (0.97 percent), 0.63 percent (0.54 percent), 1.32 percent (1.16 percent), and 0.70 percent (0.62 percent), respectively.

---- Insert Table 1 here ----

3.2.3. Control variables

In the multivariate analyses we control for several firm and issue characteristics which have been identified in the literature as affecting the IPO price update. We use *book assets* as of the end of the fiscal year preceding the IPO as a measure of firm size. *Firm age* is computed as the difference between the year of the IPO and the year that the issuing firm was founded. We obtain founding dates of firms from the Field-Ritter dataset (Field and Karpoff, 2002; Loughran and Ritter, 2004). We also construct an indicator variable that equals one if the sample firm raised venture capital financing prior to the IPO and designate this variable *venture capital backing*. We control for whether a sample firm is a *technology firm*, by constructing an indicator variable which equals one if the ThomsonOne database identifies the company as a technology firm. The anticipated size of the IPO, *IPO proceeds*, is the dollar value of the anticipated proceeds from the IPO offering, measured as the product of the number of shares sold in the IPO and the midpoint of the anticipated price range reported in the initial IPO prospectus. We assign the lead underwriter, as identified in the ThomsonOne new issues database, an *underwriter rank* based on Loughran and Ritter's (2002b) classification. We also construct indicator variables that equal one if the sample firm is listed on NASDAQ (designated *NASDAQ*) or the NYSE (designated *NYSE*). For each observation we compute the return on an equal-weighted NASDAQ index over the period beginning on the date that the initial IPO prospectus is filed with the SEC and ending on the date of the IPO. We designate this variable *market return*. Finally, we use the

total number of sentences in the initial IPO prospectus as a measure of prospectus length.

4. Evidence

In this section we discuss the empirical analysis, the evidence, and the implications of this evidence for our theory.

4.1. Sample descriptive statistics

Table 2 presents summary statistics for the sample. The *IPO price update* and *IPO initial return* statistics in Panel A are consistent with those reported in other studies (see, for example, Lowry and Schwert, 2004; and Hanley and Hoberg, 2010). The mean (median) *IPO price update* is 1.8 percent (0.0 percent). While the mean value is small, there is considerable variation, with a standard deviation 26.9 percent. In contrast, the mean (median) *IPO initial return* is quite large at 31.7 percent (12.5 percent). By comparison, Hanley and Hoberg (2010) report mean (median) values of 4.3 percent (0.0 percent) and 36.4 percent (13.4 percent), respectively. The mean (median) value of the *IPO initial price range*, computed as the dollar value of the initial price range divided by the midpoint of that range, is 14.8 percent (15.4 percent).

---- Insert Table 2 here ----

Panel B of Table 2 presents statistics for the five measures of uncertainty. The mean (median) value of the *sales growth rate* is 383.4 percent (56.1 percent) and there is considerable variation across the sample firms. These high numbers are consistent with what we would expect from firms that are selling shares to the public for the first time. To the extent that growth prospects tend to be highly uncertain, these numbers also suggest that there is likely to be considerable uncertainty about the true value of the shares being sold.

The mean (median) value of *R&D expenditures*, 0.22 (0.04), and the standard deviation

of this measure, 0.77, suggest that there is considerable cross-sectional variation in R&D investment. Furthermore, the positive mean value for *R&D expenditures*, which is an industry-adjusted measure, indicates that average R&D expenditures are higher at the sample firms than at other industry firms.

The mean (median) value of *implied growth opportunities*, 0.81 (1.00) tells us that a very high percentage of the IPO price for many firms is attributable to growth opportunities. The median value tells us that more than half of the sample firms are not profitable at the time of the IPO. In fact, examination of the data reveals that only 43.4 percent of the sample firms report positive earnings in the year ending immediately before the IPO.

The mean (median) value of *Tobin's q*, 4.14 (2.47) also suggests that a relatively large proportion of the value of the shares being sold by the firms in our sample is attributable to growth opportunities. By comparison, the median value of *Tobin's q* for the firms in the NYSE, NASDAQ, and American Stock Exchange (ASE) in the individual years during our sample period ranged from a low of 1.05 to 1.57. Furthermore, the standard deviation of *Tobin's q* for our sample, 6.78, indicates that there is also a great deal of cross-sectional variation in the value of this variable.

Finally, Panel B of Table 2 shows that the mean (median) length of time that management expects the funds raised in the IPO to last is 15.1 months (12 months). The value of this variable is exactly 12 months for 64.5 percent of the sample firms, but there is still considerable variation, with estimates ranging from 1 month to 62 months. A specific estimate of the time that the IPO proceeds are expected to last was reported in 56.7 percent (1,278) of the 2,254 prospectuses.

Panel C of Table 2 indicates that there is also considerable variation in other firm and issue characteristics. The mean (median) firm has *book assets* of $403.29 million ($44.05

million) and the standard deviation of this variable is $1,923.95 million. The relatively small median value indicates that the distribution is highly skewed.

The mean (median) value of *firm age* at the time of the offering is 16.0 years (8.0 years). While most firms in the sample tend to be relatively young, the standard deviation and maximum values, 21.7 years and 165 years, respectively, indicate that some firms have operated for a considerable period of time. Also, we find that 51.6 percent of the sample firms received venture capital funding and that 64.9 percent of the sample firms are identified by Thomson One as being technology firms.

With regards to issue characteristics, the mean (median) amount of capital initially expected to be raised in the IPO is $144.56 million ($67.32 million) and the mean (median) *underwriter rank* is 8.1 (9.0). We note that the anticipated IPO proceeds are quite large relative to book assets. The IPOs tend to raise substantial capital, relative to the issuing firms' assets.

Following the IPO, 79.3 percent of the sample firms are listed on NASDAQ, 19.2 percent are listed on NYSE, and 1.5 percent are listed on the ASE. Finally, the mean (median) *market return*, measured as the equal-weighted cumulative return on the CRSP portfolio of NASDAQ stocks, over the period from the date on which the initial IPO prospectus is filed to the date of the IPO, is 4.1 percent (2.1 percent).

4.2. Uncertainty and marketing content

Our theory suggests that the information provided in the initial IPO prospectus, as well as other information generated through the book-building process, is more informative about the value of a firm's shares where there is greater uncertainty about the value estimate obtained from the due diligence process. If this is true, greater uncertainty about share values should be associated with greater cross-sectional variation in the *IPO price update* because initial value

estimates should be more sensitive to information disclosures.

To the extent that the five measures of growth opportunity uncertainty that we consider also reflect uncertainty with respect to share values, we expect to observe greater variation in the IPO price updates among firms where these measures indicate higher uncertainty. To obtain evidence on this prediction, we partition the sample into high and low uncertainty sub-samples of equal size using each of the uncertainty measures described in Section 3.2.2. We then compare the standard deviation of *IPO price update* for the two subsamples obtained using each uncertainty measure. The results of this analysis are presented in the first five columns of Table 3. The differences in each of these columns are consistent with the hypothesis that our uncertainty measures capture uncertainty with respect to share values. Greater uncertainty is associated with a larger standard deviation in *IPO price update* for *sales growth rate*, *R&D expenditures*, *implied growth opportunities*, *Tobin's q*, and *months of capital with IPO funds*.

---- Insert Table 3 here ----

Our theory also suggests that managers and underwriters utilize the book-building process to determine the value implications of information they collect in due diligence activities when the value implications of such information is uncertain. Recall that we focus on *marketing content* in initial IPO prospectuses because determining the value implications of such content can require an especially deep understanding of environmental factors and their value implications. If informed investors have such an understanding, as Benveniste and Spindt (1989) suggest, managers and underwriters at firms with greater uncertainty might include more *marketing content* in the initial IPO prospectus with the expectation that investors will help them assess the value implications of this content.

To the extent that the level of *marketing content* in initial IPO prospectuses is positively

related to the disclosure of value-relevant information, we would expect to observe a positive relation between *marketing content* and the cross sectional variation in *IPO price update*. The last column in Table 3 shows that there is such a relation in our sample. The standard deviation of *IPO price update* is significantly greater among firms with high *marketing content* than among firms with low *marketing content*.

To obtain additional evidence on the relation between the levels of *marketing content* in the initial IPO prospectuses and uncertainly with respect to share value, we calculated the correlations between *marketing content* and each of the five uncertainty measures. These correlations, which are presented in the first row in Table 4, indicate that marketing content is significantly positively related to uncertainty, as measured by all of the uncertainty measures, with the exception of *R&D expenditures*. More *marketing content* is included in initial IPO prospectuses when there is more uncertainty about share values, as measured by *sales growth rate*, *implied growth opportunities*, *Tobin's q*, and *months of capital with IPO funds*. The correlation between marketing content and *months of capital with IPO funds* is negative because a smaller value for *months of capital with IPO funds* is associated with greater uncertainty.

---- Insert Table 4 here ----

The positive correlation between *marketing content* and *R&D expenditures* is consistent with the evidence from the correlations for the other uncertainty measures. However, the statistical insignificance indicates a weaker relation, perhaps because *R&D expenditures* is a noisier measure. Part of the problem may arise because we set the value of *R&D expenditures* equal to zero when it is reported as a missing variable. However, this choice does not fully explain the weak relation. When we exclude the 716 observations where R&D is listed as missing, the correlation is still positive and insignificant.

In Table 4 and the subsequent tables we transform *sales growth rate* by adding 1.01 to the unadjusted value and then taking the natural log of this sum. We do this because *sales growth rate* is zero or negative for 149 of the firms in our sample, with 9 of these observations having negative 100 percent sales growth. We add a value slightly greater than one to the raw sales growth value because the natural log function is only defined for positive numbers. The evidence from our empirical analysis is qualitatively similar when we use a simple log transformation of *growth rate* when its value is positive and exclude all observations when its value is negative.

4.3. Bivariate evidence on IPO price update, marketing content, and uncertainty

If more *marketing content* tends to be included in initial IPO prospectuses and initial price estimates are more conservative when there is greater uncertainty about share values, we would expect to observe, on average, a more positive *IPO price update* when *marketing content* is higher and when uncertainty is greater.

To obtain initial evidence on this prediction, we first partition our sample independently based on the median value of *marketing content* and then the median value of each of the five uncertainty measures. We next compute the mean *IPO price update* for each of the four subsamples for each uncertainty measure. Initial IPO prospectuses with *marketing content* that is above the median value are classified as having high *marketing content* and other prospectuses are classified as having low *marketing content*. Similarly, for each uncertainty measure, with the exception of m*onths of capital with IPO funds*, firms in the subsample with values above the median are classified as having high uncertainty and those with values below the median are classified as having low uncertainty. Since a lower value of *months of capital with IPO funds* is associated with greater uncertainty, firms in the subsample with values of this variable that are

below the median are classified as having high uncertainty and those with values above the median are classified as having low uncertainty. Finally, we test the differences across subsamples based on *marketing content* and uncertainty for evidence on our predictions. Table 5 presents results from this analysis.

---- Insert Table 5 here -----

Panel A of Table 5 shows the mean *IPO price update* for partitions of the sample based upon whether the initial IPO prospectus has high or low *marketing content* and whether the firm has a high or low *sales growth rate*. The evidence in this panel is consistent with the idea that the book-building process is an important mechanism through which *marketing content* gets incorporated into the offer price. The average *IPO price update* is significantly larger for firms with high *marketing content* in their initial IPO prospectus than for firms with low *marketing content* in their initial IPO prospectus, regardless of whether the *sales growth rate* is high or low. This is a very robust result which also holds for all of the other uncertainty measures in Panels B through E. In all partitions based on the different uncertainty measures, the *IPO price update* is larger for the high *marketing content* sub-sample than for the low *marketing content* sub-sample.

The larger mean *IPO price update* for the high *marketing content* and high *sales growth rate* sub-sample, compared with the mean *IPO price update* for the high *marketing content* and low *sales growth rate* sub-sample, in Panel A, suggests that *marketing content* in the initial IPO prospectus is especially useful in helping mangers and underwriters better incorporate the value implications of information into the IPO price when uncertainty is greater. In fact, this relation also holds for the high *marketing content* sub-samples for each of the other four uncertainty measures, in Panels B through E.

The differences in the mean *IPO price update* for uncertainty partitions with low

marketing content are not consistent across all of the panels in Table 5. However, this is not surprising. There are a number of different circumstances that might result in mixed evidence with low *marketing content*. For example, firms with high uncertainty, but low *marketing content* are likely to be those for which managers and underwriters determined that greater disclosures of *marketing content* would not materially help investors in valuing the firm. In some cases the uncertainty might be related to aspects of the firm about which outside investors are likely to have little knowledge, suggesting little benefit from setting the initial price range conservatively in anticipation of learning during the book-building process. Alternatively, uncertainty might also be related to other, non-marketing, characteristics for which investor feedback and the book building process is useful. Like with the high *marketing content* firms, in these situations we would expect managers and underwriters to set a conservative initial price range to motivate information disclosure during the book-building process.[5] Furthermore, low marketing content might, in itself, indicate that managers and underwriters feel more comfortable with their assessment of the value implications of the information that they have gathered.

4.4. Multivariate analyses

The bivariate evidence on the relations between uncertainty, marketing content, and IPO price update is consistent with the theory we are investigating. However, it is only suggestive as it does not control for other factors that might explain these relations. We now discuss multivariate analyses in which we control for other factors that are commonly considered in the IPO literature.

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[5] If ex-ante we had a clear view about where the book building process might provide relevant information concerning *non-marketing* aspects of the firm, we would expect proxies for related prospectus content to produce results that are similar to those that we find with *marketing content*.

4.4.1. Regression analysis

We estimate ordinary least squares (OLS) regression models to obtain multivariate evidence on the relations between *IPO price update* and *marketing content* and between *IPO price update* and the five uncertainty measures. *IPO price update* is the dependent variable in these models. The independent variables include all of the control variables discussed in Section 3 plus year fixed effects. Table 6 presents the coefficient estimates and associated standard errors for six of these models.

---- Insert Table 6 here ----

The models in Table 6 are estimated using *marketing content* from the MD&A section of the initial IPO prospectus because Hanley and Hoberg (2010) suggest that this is the section that investors are likely to pay most attention to. As a robustness check we also estimate models using *marketing content* from the total prospectus, prospectus summary, and the business and risk factor sections separately. Results for these models, which are consistent with those in Table 6, are presented in Table 8 and discussed in Section 4.4.2.

The coefficient estimates in Table 6 indicate that *marketing content* is positively and highly significantly related to *IPO price update*. The positive coefficient estimate for *marketing content* in all six models indicates that, controlling for other firm and issue characteristics, *IPO price update* is larger when there is more *marketing content* in the MD&A section. Like the bivariate evidence, this is consistent with our theory that managers and underwriters who are more uncertain about the value of a firm's shares tend to set a conservative initial price range and include more hard-to-value information in the initial IPO prospectus. Including such information in the prospectus helps to ensure that the information gets more accurately reflected in IPO prices through the book-building process.

The coefficient estimates for *marketing content* in Table 6 indicate that the sensitivity of *IPO price update* to changes in *marketing content* is economically significant. For example, we find that the coefficient estimate for *marketing content* in Model 1 of Table 6 indicates that a one standard deviation change in marketing content results in a price update of approximately 4.7 percent. Coefficient estimates for *marketing content* in the other models in Table 6 imply similar economic significance.

Three of the five coefficient estimates for the uncertainty measures in Models 2 through 6 of Table 6 are significantly related to *IPO price update*. Because these models control for *marketing content*, the coefficient estimates, which are positive for *sales growth rate* and *Tobin's q* and negative *for months of capital with IPO funds*, indicate that uncertainty about stock values other than that reflected in *marketing content* is also being resolved in the book-building process.

The coefficient estimates for *R&D expenditures* and *implied growth opportunities*, in Models 3 and 4, are insignificantly different from zero. The implications of these results are unclear. For example, they might indicate that the type of uncertainty captured by these measures is more fully reflected in *marketing content* than the uncertainty captured by the other three uncertainty measures. Alternatively, these results might indicate that *R&D expenditures* and *implied growth opportunities* are not good proxies for uncertainty with regards to IPO share prices.

The coefficient estimates for the control variables indicate that shares of larger firms, younger firms, firms that have more highly ranked underwriters, and firms that file longer prospectuses with the SEC tend to experience a larger *IPO price update*. These updates are also larger when the equally-weighted NASDAQ index increases more between the filing of the initial IPO prospectus and the IPO.

To investigate the extent to which uncertainty captured by each of the uncertainty

measures is reflected in *marketing content in* the initial IPO prospectus, we also estimated Models 1 through 5 in Table 6 with interaction terms between *marketing content* and the uncertainty measure. The evidence from these models is presented in Table 7.

---- Insert Table 7 here ----

Table 7 shows that the coefficient estimates for the interaction terms between *marketing content* and both *R&D expenditures* and *implied growth opportunities* are positive and significant. Recall that *R&D expenditures* and *implied growth opportunities* are the two uncertainty measures for which coefficient estimates were insignificantly different from zero in Table 6. The coefficient estimates for the interaction terms for these variables in Table 7 suggest that the type of uncertainty they are capturing is, on average, better accounted for in the book-building process when more *marketing content* is included in initial IPO prospectuses. In contrast, the insignificant coefficient estimates for the interaction terms including *sales growth rate*, *Tobin's q*, and *months of capital with IPO funds* indicate that increasing marketing content does not increase the extent to which the uncertainty captured by these measures is reflected in IPO prices.

4.4.2. Robustness tests

Marketing content in different sections of the IPO prospectus: Recall that we focus on *marketing content* in the MD&A section of the initial IPO prospectus because Hanley and Hoberg (2010) suggest that this is the section that investors are likely to pay most attention to. However, Table 1 shows that there is substantial *marketing content* throughout the initial IPO prospectus. In fact, the prospectus summary and the business and risk factor sections all contain more *marketing content* than the MD&A section. As a check on the robustness of the evidence from the MD&A section, we also investigated whether the evidence is sensitive to the part of the

initial IPO prospective that we examine. In this analysis we re-estimated the models in Tables 6 and 7 using *marketing content* from the total initial prospectus, the prospectus summary, and the business and risk factors sections. Table 8 reports estimates from part of this analysis.

---- Insert Table 8 here ----

Column 1 in Table 8 presents coefficient estimates from Models 2 through 6 in Table 6 to facilitate comparisons. Columns 2, 3, 4, and 5 in Table 8 present the coefficient estimates for *marketing content* in the total prospectus, prospectus summary, and the business and risk factors sections, respectively. The evidence from these models shows that the results in Table 6 are robust to the part of the initial prospectus in which *marketing content* is measured. In untabulated results we also find that the results in Table 7, which are for models that include the interaction terms between *marketing content* and the uncertainty measures, are robust to *measuring marketing* content for the total prospectus, the prospectus summary, and the business and risk factors sections.

Alternative measures of marketing content in IPO prospectus: In Tables 6 and 7 we measured the *marketing content* using a word-based measure where we counted all the marketing words in the MD&A section and scaled by the total number of words in the MD&A section. To investigate the robustness of the results to our decision to measure *marketing content* at the word level, we re-estimated the models in Table 6 using a sentence-based measure of *marketing content*. We obtain this measure by counting the number of sentences with marketing words in them and then scaling this count by the total number of sentences in the MD&A section. The coefficient estimates from this analysis, which are presented in Column 6 of Table 8, indicate that the results from Table 6 are robust to the use of a sentence-based measure instead of a word-based measure of *marketing content*.

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We investigated whether the absolute value of the *IPO price update*, as opposed to the actual value of this update, is related to *marketing content* and measures of the uncertainty about the value of this information. In Tables 6, 7, and 8 we used the actual value of the *IPO price update* as the dependent variable because, as we noted earlier, arguments by Edelen and Kadlec (2005) and by Benveniste and Spindt (1989) and Sherman and Titman (2002) suggest that price updates will be positively related to the amount of value-relevant information disclosed in the initial prospectus. We also estimated all of the models in these tables with the absolute value of the *IPO price update* as the dependent variable to further investigate our assumption concerning the directionality of the relations. The coefficient estimates for *marketing content*, the interaction terms with *marketing content*, and the uncertainty measures are insignificantly different from zero in all but one of the models that use the absolute value of *IPO price update*. The sole exception is that when we estimate the model in Column 5 of Table 8 using absolute vale of *IPO price update*, the coefficient estimate for *marketing content* is significant at the 10 percent level.

Alternative measure of R&D expenditures: Up to this point we have measured *R&D expenditures* by scaling each firm's R&D expenses by book assets and then subtracting the median value of this ratio for the firm's two-digit SIC industry. We checked the robustness of the results of our decision to use an industry-adjusted measure of *R&D expenditures* by estimating Model 3 in Table 6 and Model 2 in Table 7 using the unadjusted ratio of *R&D expenditures* divided by book assets. We find that the signs significance of the coefficient estimates for *marketing content* and the interaction between *marketing content* and *R&D expenditures* are robust to the decision to industry-adjust the R&D measure.

4.5. Marketing content and initial returns following the IPO

While our theory is silent on the effects of the *marketing content* in the initial IPO prospectus on stock returns once public trading begins, we also examine this relation because it is possible that the initial stock returns are correlated with *marketing content*. This might occur, for example, if higher *marketing content* is associated with greater uncertainty regarding the value of a firm's growth opportunities and not all of this uncertainty is resolved in the book-building process.

We examine the relations between *marketing content* and the stock return on the first day of public trading, measured as the percentage difference between the aftermarket price on the first day of trading and the offer price (see Loughran and Ritter (2002) for more information on this calculation).[6] Table 9 presents coefficient estimates for regression models in which the dependent variable is the stock return on the first day of trading and the explanatory variables include *marketing content* and the uncertainty measures, along with all of the control variables and year fixed effects in Tables 6, 7, and 8. Following Lowry and Schwert (2004), we also include the IPO price update in some of the models to investigate its relation to the first day stock return.

---- Insert Table 9 here ----

Models 1 and 2 in Table 9 include *marketing content*, but no uncertainty measure. Comparison of the coefficient estimates for *marketing content* across the two models reveals that when both *marketing content* and *IPO price update* are included as explanatory variables (Model 1), *IPO Price Update* is significantly positively related to the first day stock return and *marketing*

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[6] Following Lowry, Officer, and Schwert (2010), we also measure initial returns as the percent difference between the closing price on the 21st day of trading and the offer price. This latter measure limits any effects associated with underwriter price stabilization activities that might influence the trading prices of IPO stocks in the days immediately following the offering (Hanley, Kumar, and Seguin, 1993). The results from this analysis are similar to those for the first day return.

content is unrelated to this return. However, when only *marketing content* is included as an explanatory variable (Model 2), it is significantly positively related to the first day stock return. These results suggest that value-relevant information reflected in *marketing content* is reflected in *IPO price update*, but not completely. Some of this information is not reflected in the stock price until it begins trading in the public market. The fact that all of the information associated with *marketing content* is not reflected in share prices until the shares begin trading suggests that investors who participate in the book-building process are being compensated for helping in the price-setting process.

Models 3 through 12 in Table 9 are similar to Models 1 and 2, except that they include uncertainty measures as explanatory variables. The coefficient estimates for *marketing content* in Models 3 through 12 are all consistent with those in Models 1 and 2. *Marketing content* is insignificantly related to the first day stock return when *IPO price update* is included as an explanatory variable, but is positively and significantly related to the first day return when *IPO price update* is not included.

The other noteworthy evidence from Models 3 through 12 in Table 9 is that the coefficient estimates for all of the uncertainty measures, other than *R&D expenditures*, indicate that greater uncertainty is associated with a larger first day return. This is consistent with the idea that managers price shares more conservatively when there is greater uncertainty. While not statistically significant, even the signs of the coefficient estimates for *R&D expenditures* in Models 5 and 6 are consistent with this same idea.

5. Conclusions

We investigate how information about the value of a firm gets incorporated in the price at which its shares are offered in its IPO. The evidence suggests that there is an interaction between

the due diligence and the book-building processes that has not received much attention in the literature. Specifically, when there is greater uncertainty about the value of a firm's shares, the initial anticipated price range appears to be set more conservatively and more information about activities in marketing, brand, sales, channel, and customer management, as well as advertising, is included in the initial IPO prospectus. This combination of findings suggests that the additional information is being included in prospectuses so that potential investors can help assess its value implications during the book-building process. These investors are compensated for their efforts through underpricing in the IPO.

This study adds to our understanding of the ways in which due diligence activities affect IPO pricing and the value implications of disclosures in IPO prospectuses. Hanley and Hoberg (2010) present evidence consistent with the theory that more information collected through due diligence activities results in more accurate anticipated price range estimates and that information is disclosed in prospectuses to provide credibility for these estimates. The evidence in our study indicates that not all information that is collected in the due diligence process is accurately reflected in the initial anticipated price range or included in the IPO prospectus for credibility. Some of this information is included in the prospectus so that potential investors can help assess its value during the book-building process. This interaction between due diligence activities and book-building has received little attention in the literature.

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Table 1

Marketing content by prospectus section

Descriptive statistics for *marketing content* in initial IPO prospectuses. Data are from initial prospectuses for 2,254 firms that completed an IPO between 1996 and 2013. The panels list the total number of words (*total words*) and the percentage of words which are related to *marketing content*. Panel A describes the entire prospectus, while Panels B through E list the results for the prospectus summary and each of the major prospectus sections. The algorithm used to parse the text and the construction of these measures are described in detail in Section 3.2. of the text.

	N	Mean	Median	Standard Deviation	Minimum	Maximum
Panel A: Total prospectus						
Total words	2,254	59,682	48,791	30,070	17,824	431,362
Marketing content	2,254	0.52%	0.47%	0.31%	0.02%	1.87%
Panel B: Prospectus summary						
Total words	2,254	1,663	1,234	1,222	35	11,230
Marketing content	2,254	1.21%	0.97%	1.05%	0.00%	7.27%
Panel C: Management discussion and analysis (MD&A) section						
Total words	2,254	7,077	5,115	4,983	614	34,983
Marketing content	2,254	0.63%	0.54%	0.50%	0.00%	3.50%
Panel D: Business section						
Total words	2,254	8,857	7,809	3,997	2,018	37,443
Marketing content	2,254	1.32%	1.16%	0.94%	0.00%	5.69%
Panel E: Risk factors section						
Total words	2,254	7,888	6,722	4,471	872	31,130
Marketing content	2,254	0.70%	0.62%	0.47%	0.00%	2.61%

Table 2

IPO and issuing firm descriptive statistics

Descriptive statistics for 2,254 firms that completed an IPO between 1996 and 2013. *IPO price update* is the percentage change in price from the midpoint of the anticipated price range provided in the initial prospectus to the final offering price in the IPO. *IPO initial return* is the percentage change from the offering price in the IPO to the closing price on the first day of trading. *IPO initial price range* is the difference between the top and bottom of the anticipated price range listed in the initial prospectus, divided by the midpoint of that range. *Sales growth rate* is the annualized sales growth rate measured over the two years beginning with the fiscal year that ends immediately before the IPO (i.e., from t-1 through t+1, where t is the year in which the IPO took place). *R&D expenditures* is the industry-adjusted ratio of research and development (R&D) expenditures in the fiscal year prior to the IPO divided by *book assets* at the end of that year. Industry adjustments are made by subtracting the median value for all firms in the same two-digit SIC industry that are listed in Compustat. *Implied growth opportunities* is an estimate of the present value of the future growth in earnings implied by the IPO price, stated as a percentage of its market capitalization. It is calculated using earnings from the fiscal year in which the IPO took place. *Tobin's q* is calculated as of the end of the fiscal year in which the IPO took place. The calculation is: [book assets – common equity book value + (common shares outstanding × common share price)]/book assets. *Months of capital with IPO funds* is the number of months that managers of the firm expect the IPO proceeds to last, as stated in the initial prospectus. *Book assets* is measured in millions of dollars and is as of the end of the fiscal year immediately prior to the year in which the initial prospectus is filed. *Firm age* is the age of firm from its founding as a private company until its IPO, as reported on Jay Ritter's website. V*enture capital backing* is an indicator variable that equals one if professional venture capitalists invested in the firm prior to the IPO. *Technology firm* is an indicator variable that equals one if the ThompsonOne database identifies the company as a technology firm. *IPO proceeds* is the anticipated proceeds from the IPO calculated using the number of shares the firm anticipates offering and the midpoint of the anticipated price range reported in the initial prospectus, measured in millions of dollars. *Underwriter rank* is the reputation ranking of the IPO underwriter, as reported on Jay Ritter's website and used in Loughran and Ritter (2004). *NYSE*, *NASDAQ*, and *ASE* are indicator variables that equal one if the IPO was listed on NYSE, NASDAQ, or ASE. *Market Return* is the equal-weighted cumulative return on the CRSP portfolio of NASDAQ stocks, calculated from the date a prospectus is filed containing an initial price range to the date of the IPO offering. Data for these indicator variables are obtained from ThompsonOne.

	N	Mean	Median	Standard Deviation	Minimum	Maximum
Panel A: IPO prices and returns						
IPO price update	2,254	1.8%	0.0%	26.9%	-69.8%	220.0%
IPO initial return	2,254	31.7%	12.5%	62.5%	-42.2%	626.7%
IPO initial price range	2,254	14.8%	15.4%	5.3%	0.0%	50.0%
Panel B: Uncertainty measures						
Sales growth rate	1,913	383.4%	56.1%	4321.9%	-100.0%	165271.0%
R&D expenditures	2,254	0.22	0.04	0.77	0.00	25.26
Implied growth opportunities	2,204	0.81	1.00	0.33	-3.44	1.00
Tobin's *q*	2,205	4.14	2.47	6.78	0.21	105.09
Months of capital with IPO funds	1,278	15.1	12.0	6.3	1.0	62.0
Panel C: Other firm and issue characteristics						
Firm characteristics:						
Book assets ($ millions)	2,254	$403.29	$44.05	$1,923.95	$0.05	$52,071.00
Firm age	2,254	16.0	8.0	21.7	0.0	165.0
Venture capital backing	2,254	51.6%				
Technology firm	2,254	64.9%				
Issue characteristics:						
IPO proceeds ($ milllions)	2,254	$144.56	$67.32	$471.35	$4.00	$13,268.86
Underwriter rank	2,254	8.1	9.0	1.4	1.0	9.0
NASDAQ	2,254	79.3%				
NYSE	2,254	19.2%				
ASE	2,254	1.5%				
Market return	2,254	4.1%	2.1%	11.5%	-40.1%	168.9%

Table 3

Standard deviation of IPO price update, uncertainy measures, and marketing content

This table presents the standard deviation of the *IPO price update* (first two rows) and statistics for tests of differences in that standard deviation across sample partitions sorted on *marketing content* and uncertainty measures for 2,254 firms that completed an IPO between 1996 and 2013. The splits between high and low sub-samples are based on the median values for each variable. All variables are defined in Tables 1 and 2. p-values are reported in each column for tests of the hypothesis that the high and low uncertainty sub-samples have equal variances. The p-value for the folded F-test is calculated for an F-test under the assumption that the two samples are normally distributed. The second p-value is for Levene's robust test for equality of variances.

	Uncertainty Measures					Marketing Content
	Sales Growth Rate	R&D Expenditures	Implied Growth Opportunities	Tobin's q	Months of Capital with IPO Funds	Marketing Content
High uncertainty or high marketing content	30.7%	28.6%	31.3%	29.1%	28.4%	29.3%
Low uncertainty or low marketing content	21.4%	25.1%	20.6%	23.7%	25.1%	22.6%
Difference	9.3%	3.5%	10.7%	5.4%	3.3%	6.8%
p-value for folded F-test	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
p-value for Levene's Test	<0.001	0.042	<0.001	0.002	0.134	<0.001
Number of observations	1,913	2,254	2,204	2,205	1,278	2,254

Table 4

Correlation matrix for marketing content and uncertainty measures

Correlations are for a sample of 2,254 firms that completed an IPO between 1996 and 2013. All variables are defined in Tables 1 and 2.

		ln (1.01 + Sales Growth Rate)	R&D Expenditures	Implied Growth Opportunities	Tobin's q	Months of Capital with IPO Funds
Marketing content	Correlation	0.1610	0.0168	0.1359	0.1844	-0.1874
	p-value	<0.0001	0.4261	<0.0001	<0.0001	<0.0001
	No. of observations	1,913	2,254	2,204	2,205	1,278
ln (1.01 + sales growth rate)	Correlation		-0.0182	0.2039	0.3116	0.0396
	p-value		0.4270	<0.0001	<0.0001	0.1980
	No. of observations		1,913	1,905	1,906	1,058
R&D expenditures	Correlation			0.0687	0.0703	0.0030
	p-value			0.0012	0.001	0.9145
	No. of observations			2,204	2,205	1,278
Implied growth opportunities	Correlation				0.1590	0.0992
	p-value				<0.0001	0.0005
	No. of observations				2,204	1,245
Tobin's q	Correlation					-0.0352
	p-value					0.2150
	No. of observations					1,246

Table 5

IPO price update, marketing content, and uncertainty

This table presents the mean values of the *IPO price update* for different sample partitions independently sorted on marketing content and uncertainty measures or 2,254 firms that completed an IPO between 1996 and 2013. The splits between high and low sub-samples are based on the median values for each variable. All variables are defined in Tables 1 and 2. p-values for the differences across subsamples are presented for a t-test assuming unequal variances and for the non-parametric Wilcoxon ranked sum test.

Panel A: Marketing Content and Sales Growth Partitions (N = 1,913)

| Marketing Content | Total | Sales Growth Rate | | Difference | p-value for t-test | p-value for Wilcoxon Ranked Sum Test |
		High Uncertainty	Low Uncertainty			
Total sample		6.9%	-2.1%	9.0%	<0.001	<0.001
High marketing content sub-sample	9.1%	13.3%	1.1%	12.1%	<0.001	<0.001
Low marketing content sub-sample	-3.4%	-1.8%	-4.6%	2.8%	0.070	0.106
Difference	12.5%	15.1%	5.7%			
p-value for t-test	<0.001	<0.001	<0.001			
p-value for Wilcoxon Ranked Sum Test	<0.001	<0.001	<0.001			

Panel B: Marketing Content and R&D Expenditures Partitions (N = 1,692)

| | Total | R&D Expenditures | | Difference | p-value for t-test | p-value for Wilcoxon Ranked Sum Test |
		High Uncertainty	Low Uncertainty			
Total sample		2.7%	1.0%	1.7%	0.140	0.161
High marketing content sub-sample	8.2%	9.7%	6.3%	3.3%	0.054	0.040
Low marketing content sub-sample	-4.5%	-6.3%	-3.2%	-3.1%	0.021	0.048
Difference	12.8%	16.0%	9.5%			
p-value for t-test	<0.001	<0.001	<0.001			
p-value for Wilcoxon Ranked Sum Test	<0.001	<0.001	<0.001			

Panel C: Marketing Content and Implied Growth Options (N = 2204)

| | Total | Implied growth options | | Difference | p-value for t-test | p-value for Wilcoxon Ranked Sum Test |
		High Uncertainty	Low Uncertainty			
Total sample		2.1%	1.2%	0.9%	0.436	0.535
High marketing content sub-sample	7.9%	10.3%	4.7%	5.6%	<0.001	0.014
Low marketing content sub-sample	-4.6%	-8.0%	-1.6%	-6.4%	<0.001	<0.001
Difference	12.5%	18.2%	6.3%			
p-value for t-test	<0.001	<0.001	<0.001			
p-value for Wilcoxon Ranked Sum Test	<0.001	<0.001	<0.001			

Panel D: Marketing Content and Tobin's *q* (N = 1,660)

| | Total | Tobin's *q* | | Difference | p-value for t-test | p-value for Wilcoxon Ranked Sum Test |
		High Uncertainty	Low Uncertainty			
Total sample		4.8%	-1.5%	6.3%	<0.001	<0.001
High marketing content sub-sample	7.9%	11.0%	3.6%	7.5%	<0.001	<0.001
Low marketing content sub-sample	-4.6%	-3.8%	-5.1%	1.3%	0.360	0.121
Difference	12.5%	14.9%	8.7%			
p-value for t-test	<0.001	<0.001	<0.001			
p-value for Wilcoxon Ranked Sum Test	<0.001	<0.001	<0.001			

Panel E: Marketing Content and Months of Capital with IPO Funds (N = 1,278)

| | Total | Months of Capital With IPO Funds | | Difference | p-value for t-test | p-value for Wilcoxon Ranked Sum Test |
		High Uncertainty	Low Uncertainty			
Total sample		4.0%	-4.6%	8.6%	<0.001	<0.001
High marketing content sub-sample	8.5%	9.9%	3.9%	6.1%	0.018	0.021
Low marketing content sub-sample	-6.1%	-3.8%	-9.4%	5.6%	0.003	0.016
Difference	14.6%	13.7%	13.2%			
p-value for t-test	<0.001	<0.001	<0.001			
p-value for Wilcoxon Ranked Sum Test	<0.001	<0.001	<0.001			

Table 6

IPO price update, marketing content in the Management Discussion and Analysis (D&A) section, and uncertainty

Coefficient estimates from OLS regressions of *IPO Price Update* on *marketing content*, uncertainty measures, and variables previously documented in the IPO literature. Data are for 2,254 firms that completed an IPO between 1996 and 2013. All variables are defined in Tables 1 and 2. All regressions also include year fixed effects. The standard errors (reported in parentheses) have been corrected for heteroskedasticity in the manner of White (1980).

Dependent variable:	IPO Price Update					
Uncertainty measure:		ln (1.01 + Sales Growth)	R&D Expenditures	Implied Growth Opportunities	Tobin's *q*	Months of Capital with IPO Funds
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-11.420	-10.724	-12.638	-13.053	-4.256	-21.075
	(22.765)	(33.472)	(23.234)	(22.808)	(22.633)	(28.773)
Marketing content	934.549***	828.882***	931.840***	975.334***	893.509***	769.564***
	(96.177)	(97.038)	(96.589)	(114.009)	(97.608)	(131.454)
Uncertainty measure		3.252***	-0.634	1.734	1.226***	-0.302***
		(0.807)	(0.828)	(2.074)	(0.326)	(0.091)
Control variables:						
Ln (Book assets)	1.898**	2.139*	1.786**	1.838**	2.621***	1.791**
	(0.765)	(1.134)	(0.834)	(0.825)	(0.706)	(0.653)
Ln (Firm age)	-1.773**	-1.225	-1.749**	-1.705***	-1.676**	-2.489**
	(0.721)	(0.776)	(0.732)	(0.576)	(0.631)	(0.938)
Technology firm	0.737	1.187	0.746	0.576	-0.377	0.950
	(2.395)	(2.638)	(2.397)	(2.296)	(2.300)	(2.715)
Venture capital backing	2.539	2.057	2.539	1.926	2.032	2.864
	(2.084)	(2.072)	(2.089)	(1.925)	(2.002)	(1.857)
Ln (IPO proceeds)	-2.432	-2.906	-2.320	-2.283	-2.714	-3.472*
	(1.724)	(2.151)	(1.764)	(1.720)	(1.569)	(1.831)
Underwriter rank	1.912***	1.703**	1.912***	1.912***	1.417**	1.773**
	(0.613)	(0.591)	(0.616)	(0.601)	(0.521)	(0.653)
NYSE	-1.810	-1.358	-1.696	-1.477	-1.217	2.324
	(4.944)	(5.641)	(4.943)	(5.058)	(4.669)	(5.683)
NASDAQ	-4.102	-3.143	-4.050	-4.078	-3.882	-0.909
	(4.726)	(5.457)	(4.732)	(4.780)	(4.485)	(5.008)
Market return	0.312***	0.325***	0.312***	0.319***	0.360***	0.338**
	(0.077)	(0.080)	(0.077)	(0.078)	(0.080)	(0.133)
Ln(Total Words)	3.823	4.427	3.771	3.537	3.215	7.608**
	(2.295)	(3.261)	(2.296)	(2.163)	(2.183)	(3.318)
Number of observations	2,254	1,913	2,254	2,204	2,205	1,278
R-squared	0.083	0.086	0.083	0.085	0.115	0.099

Table 7

IPO price update, marketing content in the Management Discussion and Analysis (D&A) section, and uncertainty

Coefficient estimates from OLS regressions of *IPO Price Update* on *marketing content*, uncertainty measures, and variables previously documented in the IPO literature. Data are for 2,254 firms that completed an IPO between 1996 and 2013. All variables are defined in Tables 1 and 2. All regressions also include year fixed effects. The standard errors (reported in parentheses) have been corrected for heteroskedasticity in the manner of White (1980).

Dependent variable:	IPO Price Update				
Uncertainty measure:	ln (1.01 + Sales Growth) Model 1	R&D Expenditures Model 2	Implied Growth Opportunities Model 3	Tobin's q Model 4	Months of Capital with IPO Funds Model 5
Constant	-9.636	-10.156	-7.675	-4.802	-22.159
	(32.314)	(23.707)	(23.735)	(21.833)	(30.840)
Marketing content	790.290***	914.031***	250.597	1,016.634***	885.809*
	(91.799)	(99.437)	(327.392)	(114.144)	(448.868)
Marketing content × Uncertainty measure	54.769	442.792***	851.372**	-32.815	-7.939
	(110.081)	(135.298)	(332.109)	(31.007)	(25.159)
Uncertainty measure	2.893*	-1.423	-2.554	1.551***	-0.262
	(1.409)	(0.930)	(2.297)	(0.206)	(0.176)
Control variables:					
Ln (Book assets)	2.171*	1.923**	1.806**	2.675***	1.799**
	(1.093)	(0.840)	(0.839)	(0.734)	(0.653)
Ln (Firm age)	-1.219	-1.758**	-1.598**	-1.695**	-2.507**
	(0.782)	(0.744)	(0.575)	(0.629)	(0.910)
Technology firm	1.201	0.776	0.588	-0.524	0.917
	(2.617)	(2.393)	(2.301)	(2.193)	(2.747)
Venture capital backing	2.064	2.405	1.930	2.064	2.806
	(2.066)	(2.096)	(1.964)	(2.020)	(1.809)
Ln (IPO proceeds)	-2.946	-2.374	-2.296	-2.770*	-3.474*
	(2.099)	(1.779)	(1.730)	(1.589)	(1.843)
Underwriter rank	1.704**	1.854***	1.881***	1.402**	1.770**
	(0.591)	(0.608)	(0.601)	(0.521)	(0.652)
NYSE	-1.417	-1.674	-1.329	-1.298	2.320
	(5.639)	(4.924)	(4.987)	(4.665)	(5.704)
NASDAQ	-3.199	-3.921	-3.881	-4.063	-0.912
	(5.461)	(4.707)	(4.702)	(4.485)	(5.026)
Market return	0.325***	0.313***	0.316***	0.361***	0.338**
	(0.079)	(0.077)	(0.079)	(0.079)	(0.132)
Ln(Total Words)	4.399	3.583	3.343	3.295	7.677**
	(3.255)	(2.265)	(2.182)	(2.170)	(3.414)
Number of observations	1,913	2,254	2,204	2,205	1,278
R-squared	0.087	0.084	0.087	0.115	0.099

Table 8

IPO price update, marketing content for IPO prospectus and individual sections, and uncertainty

This table lists reults from OLS regressions of *IPO price update* on *marketing content* and variables previously documented in the IPO literature. Data are for 2,254 firms that completed an IPO between 1996 and 2013. The explanatory variables in each model are the same as those in Models 2 through 6 in Table 6. Model 1 in this table is the same as Model 2 in Table 6 and is presented again to facilitate comparisons. All variables are defined in Tables 1, 2, and 6. All regressions also include year fixed effects. Coefficient estimates for all but the variables for *marketing content* and the uncertainty measures are excluded for brevity. Each column presents results for five models which are estimated using *marketing content* from different portions of the IPO prospectus. The alternate measure of *marketing content*, which is used to estimate Model 6, is the percentage of sentences that contain marketing content. The standard errors (reported in parentheses) have been corrected for heteroskedasticity in the manner of White (1980).

	MD&A Section	Total Prospectus	Prospectus Summary	Business Section	Risk Factors Section	Alternative Measure of Marketing Content and the MD&A Section
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Panel A: Marketing content and ln (1.01 + sales growth) (N = 1,913)						
Marketing content	828.882***	1,419.722***	257.238***	320.409***	1,188.221***	56.887***
	(97.038)	(278.563)	(79.998)	(80.586)	(166.927)	(6.715)
ln (1.01 + sales growth)	3.252***	3.510***	3.444***	3.460***	3.391***	3.220***
	(0.807)	(0.773)	(0.782)	(0.785)	(0.718)	(0.798)
R-square	0.086	0.093	0.089	0.086	0.097	0.089
Panel B: Marketing content and R&D expenditures partitions (N = 2,254)						
Marketing content	931.840***	1,579.563***	314.893***	377.467***	1,257.551***	65.046***
	(96.589)	(216.549)	(64.291)	(55.473)	(137.269)	(6.407)
R&D expenditures	-0.634	-0.650	-0.755	-0.669	-0.807	-0.633
	(0.828)	(0.819)	(0.888)	(0.700)	(0.787)	(0.790)
R-square	0.083	0.090	0.084	0.085	0.093	0.087
Panel C: Marketing content and implied growth opportunities (N = 2,204)						
Marketing content	975.334***	1,625.056***	305.994***	372.530***	1,288.438***	67.671***
	(114.009)	(264.221)	(68.515)	(63.134)	(155.825)	(6.582)
Implied growth options	1.734	3.686*	2.578	3.377*	2.860	1.709
	(2.074)	(1.960)	(1.967)	(1.851)	(1.993)	(2.112)
R-square	0.085	0.092	0.085	0.086	0.095	0.089
Panel D: Marketing content and Tobin's *q* (N = 2,205)						
Marketing content	893.509***	1,514.686***	290.299***	361.829***	1,170.541***	62.431***
	(97.608)	(277.795)	(68.379)	(66.292)	(162.601)	(6.049)
Tobin's q	1.226***	1.210***	1.178***	1.262***	1.190***	1.221***
	(0.326)	(0.329)	(0.350)	(0.365)	(0.350)	(0.322)
R-square	0.115	0.119	0.111	0.116	0.122	0.118
Panel E: Marketing content and months of capital with IPO funds (N = 1,278)						
Marketing content	769.564***	1,568.668***	329.129***	409.226***	1,246.689***	55.005***
	(131.454)	(197.406)	(64.277)	(71.142)	(142.267)	(7.517)
Months of capital with IPO funds	-0.302***	-0.344***	-0.337***	-0.298***	-0.324***	-0.303***
	(0.091)	(0.094)	(0.088)	(0.088)	(0.088)	(0.088)
R-square	0.099	0.102	0.101	0.108	0.106	0.102

*** p<0.01, ** p<0.05, * p<0.1

Table 9

First day post-IPO stock return and marketing content in the Management Discussion and Analysis (D&A) section

This table results from OLS regressions of stock returns during the first day of public trading *on marketing content*, measures of uncertainty, and variables previously documented in the IPO literature. Data are for 2,254 firms that completed an IPO between 1996 and 2013 All variavbles are defined in Tables 1, 2, and 6. The regressions also include year fixed effects. The standard errors (reported in parentheses) have been corrected for heteroskedasticity in the manner of White (1980).

Dependent variable:			First Day Stock Return									
Uncertainty measure:			ln (1.01 + Sales Growth)		R&D Expenditures		Implied Growth Opportunities		Tobin's q		Months of Capital with IPO Funds	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Constant	82.421***	68.302**	124.214***	111.359	86.207***	70.570**	91.118***	75.157**	110.808***	105.908**	95.840***	68.741*
	(25.440)	(24.713)	(40.488)	(66.231)	(25.144)	(26.055)	(24.704)	(29.230)	(28.928)	(38.464)	(24.285)	(36.436)
Marketing content	-33.402	1,121.982***	142.524	1,136.100***	-25.983	1,127.028***	38.531	1,231.180***	-74.898	953.783***	-30.052	959.457*
	(313.929)	(288.058)	(214.459)	(249.895)	(310.606)	(286.199)	(325.023)	(321.271)	(295.927)	(303.011)	(442.536)	(456.583)
Uncertainty measure			7.162***	11.060***	1.965	1.181	7.890***	10.010***	2.810***	4.221***	-0.015	-0.402***
			(2.444)	(3.342)	(1.840)	(1.499)	(2.493)	(2.851)	(0.261)	(0.213)	(0.112)	(0.095)
Control variables:												
Ln (Book assets)	0.474	2.821*	2.566	5.130	0.818	3.029	1.206	3.454*	3.007**	6.024**	0.287	2.590
	(0.555)	(1.560)	(1.851)	(3.414)	(0.589)	(1.766)	(0.779)	(1.948)	(1.113)	(2.362)	(1.149)	(1.619)
Ln (Firm age)	-2.913	-5.104*	-2.295	-3.763	-2.983	-5.148*	-2.910	-4.995*	-3.147*	-5.077*	-2.990	-6.190*
	(1.802)	(2.696)	(1.627)	(2.501)	(1.820)	(2.737)	(1.762)	(2.504)	(1.747)	(2.471)	(2.335)	(3.172)
Technology firm	3.853	4.764	4.039	5.462	3.823	4.746	3.281	3.985	1.434	1.000	6.574**	7.795
	(2.809)	(5.003)	(3.016)	(5.490)	(2.794)	(4.981)	(2.864)	(4.858)	(2.394)	(3.902)	(2.372)	(5.319)
Venture capital backing	3.756	6.894	3.206**	5.671	3.751	6.893	2.940	5.295	3.675	6.015	-1.965	1.717
	(2.421)	(4.637)	(1.475)	(3.509)	(2.372)	(4.615)	(2.619)	(4.499)	(2.291)	(4.233)	(4.014)	(5.251)
Ln (IPO proceeds)	-5.846***	-8.853**	-8.355**	-11.838*	-6.191***	-9.062**	-6.199***	-8.991**	-7.205***	-10.329***	-6.611***	-11.076**
	(1.283)	(3.173)	(3.213)	(5.629)	(1.352)	(3.326)	(1.478)	(3.367)	(1.313)	(3.134)	(2.189)	(4.378)
Underwriter rank	2.599*	4.963**	1.959	4.000**	2.596*	4.962**	2.347*	4.685**	1.410	3.041*	4.118*	6.397*
	(1.269)	(2.025)	(1.335)	(1.848)	(1.260)	(2.018)	(1.267)	(2.008)	(0.972)	(1.544)	(2.155)	(3.052)
NYSE	-1.505	-3.743	4.085	2.457	-1.858	-3.956	-0.211	-2.017	-0.335	-1.736	-17.360*	-14.373
	(5.662)	(7.318)	(5.212)	(5.666)	(5.846)	(7.500)	(5.282)	(6.876)	(5.042)	(5.803)	(8.330)	(10.680)
NASDAQ	2.681	-2.390	8.896*	5.129	2.524	-2.487	3.607	-1.380	3.535	-0.934	-11.093*	-12.262
	(4.645)	(6.841)	(4.737)	(5.018)	(4.781)	(6.933)	(4.422)	(6.532)	(4.195)	(5.367)	(6.164)	(9.285)
Market return	-0.075	0.311***	-0.093**	0.296**	-0.076	0.310***	-0.075	0.315***	0.039	0.454***	-0.045	0.390*
	(0.060)	(0.102)	(0.042)	(0.107)	(0.060)	(0.102)	(0.065)	(0.099)	(0.057)	(0.132)	(0.078)	(0.195)
Ln (Total words)	3.600	8.327***	2.129	7.435***	3.758	8.424***	2.389	6.714**	1.968	5.670**	4.179	13.961**
	(2.913)	(2.759)	(3.715)	(2.442)	(2.969)	(2.828)	(3.128)	(2.357)	(3.134)	(2.077)	(2.617)	(5.363)
IPO price update	1.236***		1.199***		1.237***		1.223***		1.151***		1.286***	
	(0.253)		(0.243)		(0.253)		(0.258)		(0.259)		(0.276)	
Number of observations	2,254	2,254	1,913	1,913	2,254	2,254	2,204	2,204	2,205	2,205	1,278	1,278
R-squared	0.338	0.056	0.362	0.085	0.339	0.056	0.347	0.060	0.377	0.131	0.335	0.062

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix A

Marketing content: Frequency of marketing words and phrases

Frequencies are for a sample of 2,254 initial IPO prospectuses for IPOs that were completed between 1996 and 2013. This table lists the words and phrases used to measure marketing content in the overall prospectus the prospectus summary and in three key sections.

Rank	Full Prospectus Word/Phrase	Count	Percentage	Prospectus Summary Word/Phrase	Count	Percentage	Management Discussion and Analysis (MD&A) Section Word/Phrase	Count	Percentage	Business Section Word/Phrase	Count	Percentage	Risk Factors Section Word/Phrase	Count	Percentage
1	distribution	80,638	22.8%	customers	5,284	24.4%	customers	9,853	21.7%	customers	18,318	23.4%	customers	17,855	27.2%
2	customers	65,179	18.4%	distribution	2,721	12.6%	marketing	9,417	20.7%	customer	11,569	14.8%	distribution	11,034	16.8%
3	marketing	43,753	12.4%	customer	2,601	12.0%	customer	7,039	15.5%	marketing	10,652	13.6%	marketing	8,267	12.6%
4	customer	39,970	11.3%	marketing	1,993	9.2%	distribution	3,227	7.1%	distribution	5,010	6.4%	customer	6,836	10.4%
5	advertising	15,337	4.3%	brand	1,304	6.0%	advertising	2,911	6.4%	advertising	4,224	5.4%	advertising	2,996	4.6%
6	distributed	11,273	3.2%	advertising	840	3.9%	subscription	2,303	5.1%	brand	3,962	5.1%	brand	2,704	4.1%
7	brand	10,531	3.0%	retail	817	3.8%	retail	1,544	3.4%	retail	2,487	3.2%	distribute	1,427	2.2%
8	retail	8,849	2.5%	brands	696	3.2%	brand	824	1.8%	channels	1,713	2.2%	trademarks	1,350	2.1%
9	subscription	8,767	2.5%	trademarks	595	2.8%	merchandise	817	1.8%	brands	1,586	2.0%	trademark	1,175	1.8%
10	distribute	6,651	1.9%	channels	489	2.3%	subscriptions	662	1.5%	channel	1,538	2.0%	retail	940	1.4%
11	trademarks	5,148	1.5%	channel	361	1.7%	sales force	584	1.3%	sales force	1,243	1.6%	channel	847	1.3%
12	brands	4,926	1.4%	retailers	331	1.5%	subscribers	511	1.1%	retailers	1,214	1.5%	merchandise	846	1.3%
13	merchandise	4,001	1.1%	distribute	299	1.4%	channel	506	1.1%	e-commerce	1,172	1.5%	brands	642	1.0%
14	channel	3,928	1.1%	e-commerce	275	1.3%	direct sales	443	1.0%	trademark	1,103	1.4%	subscription	628	1.0%
15	channels	3,466	1.0%	trade names	273	1.3%	subscriber	395	0.9%	subscribers	1,046	1.3%	distributed	616	0.9%
16	trademark	3,387	1.0%	distributed	268	1.2%	brands	373	0.8%	trademarks	1,029	1.3%	retailers	581	0.9%
17	sales force	2,951	0.8%	sales force	261	1.2%	distribute	344	0.8%	merchandise	962	1.2%	subscribers	573	0.9%
18	retailers	2,942	0.8%	subscribers	240	1.1%	channels	339	0.7%	marketed	944	1.2%	resell	534	0.8%
19	subscribers	2,852	0.8%	merchandise	220	1.0%	retailers	326	0.7%	branded	894	1.1%	channels	531	0.8%
20	e-commerce	2,663	0.8%	branded	199	0.9%	e-commerce	310	0.7%	promote	871	1.1%	e-commerce	490	0.7%
21	subscriptions	2,543	0.7%	subscription	185	0.9%	distributed	293	0.6%	direct sales	816	1.0%	sales force	476	0.7%
22	promote	2,535	0.7%	direct sales	181	0.8%	resellers	244	0.5%	distributed	726	0.9%	promote	442	0.7%
23	marketed	2,199	0.6%	promote	181	0.8%	sales personnel	207	0.5%	distribute	636	0.8%	marketed	435	0.7%
24	branded	2,090	0.6%	subscriber	138	0.6%	branded	206	0.5%	subscriber	618	0.8%	subscriptions	423	0.6%
25	direct sales	2,013	0.6%	marketed	126	0.6%	trademarks	172	0.4%	subscription	547	0.7%	direct sales	362	0.6%
	other	15,611	4.4%	other	754	3.5%	other	1,567	3.5%	other	3,482	4.4%	other	2,741	4.2%
	Total	354,203	100.0%	Total	21,632	100.0%	Total	45,417	100.0%	Total	78,362	100.0%	Total	65,751	100.0%