

The Effect of Issuer Conservatism on IPO Pricing and Performance*

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Abstract. Based on a textual analysis of initial public offering (IPO) prospectuses, we obtain a number of important findings regarding the relation between the conservatism in prospectuses, IPO pricing, and subsequent operating and stock return performance. First, prospectus conservatism is positively related to underpricing, with the relation more pronounced for technology than nontechnology firms. Second, for nontechnology IPOs, prospectus conservatism is able to predict the firm's post-IPO operating performance. Specifically, we find that conservatism is inversely related to the firm's operating performance for the 3 years following the IPO. However, this predictability is limited to nontechnology IPOs. Finally, we find some evidence that for nontechnology IPOs conservatism is inversely related to the firm's post-IPO abnormal stock return. We conclude that the conservatism contained in an IPO's prospectus contains useful information about pricing and subsequent operating and stock return performance. Moreover, prospectus conservatism for nontechnology IPOs deserves more attention from investors.

JEL Classification: G12, G14, G24

1. Introduction

Investor sentiment and the extent to which the market is “hot” are popular issues in the initial public offering (IPO) literature (see for instance, Ritter, 1984, 1991; Helwege and Liang, 2004; Derrien, 2005; Cornelli, Goldreich, and Ljungqvist, 2006; Ljungqvist, Nanda, and Singh, 2006; Bustamante, 2012). Much less work, however, has been done on the sentiment of issuers as it relates to IPOs. The extent to which management is confident about the success of its issue and the implications that such beliefs have on IPO pricing are largely ignored in the literature. Rather, the literature emphasizes the demand for IPOs, with a focus on investor or market sentiment.

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It ignores the attitudes of the issuers themselves regarding their firms' prospects.

This study addresses that limitation by examining the beliefs of issuers about their firms' future performance. Specifically, we examine the effect that conservative or cautionary language (measured using negative tone) in the prospectus might have on IPO performance.¹ For brevity, we refer to conservative or cautionary language in a prospectus as "prospectus conservatism" or "conservatism" throughout the article. Because the issuing firms' future prospects are uncertain and management only has imperfect control over events, cautionary language will be required for a credible prospectus.

Issuers, however, face conflicting incentives concerning the extent to which they should be conservative in their prospectus language. Issuers have incentives to be conservative since a prospectus with explicit warnings and cautions is likely to be viewed as more credible by investors. Further, when the prospectus is more restrained regarding its expectations of future firm performance, the risk of litigation by disappointed investors becomes less. An excessively cautious prospectus, however, might result in the issue being undersubscribed as investors react to the limited revenue projections. Related to this, issuers with conservative prospectuses might need to underprice more to generate interest in the offering. Thus, greater prospectus conservatism might result in more money "left on the table" for the issuer.

We pose as the primary research question in this study the extent to which conservatism in a prospectus affects IPO pricing. Consequently, we examine the relation between prospectus conservatism and IPO underpricing. A related issue is whether conservatism as revealed in a prospectus contains credible information about the future performance of the issuing firm. If conservatism is informative about a firm's future performance, then we should observe that the use of cautionary language in a prospectus is inversely related to post-IPO operating performance.

To measure issuer conservatism, we analyze the text contained in issuer prepared prospectuses. The prospectus is a critically important document during the IPO process. Issuers use prospectuses to communicate with potential investors about their firm's value. While the accounting numbers in

¹ Loughran and McDonald (2011, p. 38) note that "Finance and accounting researchers generally focus on the Harvard IV-4 negative and positive word categories, although none seems to find much incremental value in the positive word lists." We independently confirm this observation from an analysis of our own data. Therefore, we focus on the negative tone measured in our study.

IPO prospectuses are closely studied by investors, analysts, and others involved in the equity issuance process, an examination of the textual or soft information contained in prospectuses is less common. This might be due to the difficulties in processing and interpreting such data. Academic studies are likewise sparse, largely limited to recent studies by Hanley and Hoberg (2010, 2012) and Arnold, Fishe, and North (2010). The soft data contained in an IPO's prospectus can convey insights and potentially valuable information that is absent from traditional quantitative projections and measures. Soft information can offer context to financial numbers and share values, provide insight into managerial expectations, and identify important qualifiers or caveats that are absent from purely numerical data. Soft information can also complement or complete the quantitative analysis provided in the prospectus.

Using a sample of 1,100 IPOs from 1999 to 2005, we examine the relation between the degree of issuer conservatism and IPO pricing. Because technology firms are especially difficult to value due to the greater uncertainty associated with their revenue projections, we conduct separate analyses for technology and nontechnology IPOs. We obtain a number of important findings regarding the effect of prospectus conservatism on IPO pricing and performance.

We find evidence that greater conservatism in the prospectus is related to increased underpricing. We observe that this relation is stronger for technology than nontechnology IPOs. This finding is consistent with the argument by Dye and Sridhar (2004) that soft information has a greater impact on share prices as hard information becomes noisier.² Because of the greater product development and sales uncertainty present in high technology industries, quantitative data is often noisier for these firms. Therefore, soft information such as prospectus conservatism tends to be more significant in explaining technology IPOs.

Further, we establish that prospectus conservatism for nontechnology IPOs contains useful information about the firm's future operating performance. In particular, we find evidence that conservatism is significantly and inversely related to the industry-adjusted return on assets for 3 years following the IPO. Moreover, this conservatism contains predictive power for post-IPO operating performance beyond that contained in the prospectus' financial statements. However, this predictability is limited to nontechnology IPOs. The lack of predictive power of prospectus conservatism for

² These results are also consistent with Baker and Wurgler (2006, 2007) and Hribar and McNinis (2012) who find that "soft" data such as sentiment more significantly affects the stock prices and analysts' forecasts of firms that are inherently difficult to value.

technology IPOs confirms the notion that such firms are fundamentally hard to value. We also conduct tests based on post-IPO abnormal stock returns. These results provide further confirmation regarding the information content of prospectus conservatism for nontechnology IPOs.

For comprehensiveness in our empirical analysis, we construct three measures of prospectus conservatism based on the word lists compiled by Loughran and McDonald (2011), the Diction software, and the Harvard Dictionary. However, the Loughran–McDonald (2011) dictionary is the only one that is compiled exclusively from financial sources, and thus is less likely to include incorrect or inappropriate words for use in a financial analysis. Therefore, we use the Loughran–McDonald (2011) dictionary as our primary source for measuring prospectus conservatism. Although there are empirical differences across the three measures of conservatism, we obtain consistency for our most general findings.

We organize the remainder of the study as follows. Section 2 briefly discusses the information content of an IPO prospectus and reviews our textual analysis methodology. Section 3 describes the procedures for the construction of our conservatism measures. We discuss our data and sample selection process in Section 4. Section 5 presents our empirical findings for both the immediate effect and the firm's longer-term performance. We conclude with a summary and a discussion of our findings in Section 6.

2. The Information Content of IPO Prospectuses

Early studies that examine IPO prospectuses require the manual reading of these documents, especially the use of proceeds section. Beatty and Ritter (1986), for instance, find that a greater number of listed proceeds uses in the prospectus results in more underpricing. This suggests that the number of uses for IPO proceeds can proxy for uncertainty. Bhabra and Pettway (2003) find that financial and operating performance data contained in the prospectus has some explanatory power regarding the firm's post IPO performance. Leone, Rock, and Willenborg (2007) examine the relation between the use of proceeds data and IPO underpricing. They find that an increase in the specificity of use-of-proceeds disclosure is associated with lower underpricing.

Recently, the use of computer algorithm-based content analysis allows for a more intensive examination of prospectuses. Arnold, Fishe, and North (2010) employ this approach to examine the Risk Factors section of a prospectus. They not only count the number of risk factors disclosed in this section, but also measure the number of words used to explain each of the

risk factors. They find that the soft information contained in the Risk Factors section is significantly related to both the initial and subsequent IPO returns.

Hanley and Hoberg (2010) examine textual information based on the word content of the entire prospectus as well as its four main sections: Summary, Risk Factors, Use of Proceeds, and Management Discussion and Analysis. Using the word content of a prospectus as a proxy for information disclosure and premarket due diligence, they find that it is related to more accurate offer prices and less underpricing.

Hanley and Hoberg (2012) apply word content analysis to a set of IPO prospectuses to analyze the relation between litigation risk, strategic disclosure, and underpricing. They find that “strong disclosure is an effective hedge against all types of lawsuits,” and “issuers tradeoff underpricing and strategic disclosure as potential hedges against litigation risk.” Their findings add to the extensive literature regarding IPO litigation risk (see e.g., Ibbotson, 1975; Tinic, 1988; Hughes and Thakor, 1992; Drake and Vetsuypens, 1993; Hensler, 1995; Lowry and Shu, 2002; Zhu, 2009; Pukthuanthong, Walker, and Turtle 2009; Hao, 2011).

This study complements these earlier analyses by explicitly investigating how word tone in a prospectus conveys economically relevant information about issue pricing. To accomplish this investigation, we use the finance-specific negative word list compiled by Loughran and McDonald (2011) as well as those generated by Diction and the Harvard Psycho-Social dictionaries. Consistent with Hanley and Hoberg (2010), we begin with an examination of the entire prospectus, followed by a separate analysis for each of the four main sections: Summary, Risk Factors, Use of Proceeds, and Management Discussion and Analysis (MD&A).³ But because we fail to obtain meaningful results in the Use of Proceeds section, we limit our presentation of empirical results to the full prospectus and the Summary, Risk Factors, and MD&A sections.

³ A prospectus contains more than the four major sections described above. Other sections that often appear in a prospectus include Capitalization, Experts, Management, Dilution, Dividend Policy, Shares Eligible for Future Sale, Description of Capital Stock, Legal Matters, Underwriting, Related Transactions, Principal Shareholders, Principal and Selling Shareholders, Material Tax Consequences, Certain Relationships, and Description of Securities.

3. Issuer Conservatism

While investor sentiment and hot markets have been an important subject in the IPO literature, the attitude of the issuer about its own prospects has rarely been examined. We address this important omission in the literature by measuring the extent to which the issuer uses cautionary or conservative language in the prospectus.

The finance literature uses three measures in its textual analysis of cautionary tone. The first of these is based on the Loughran–McDonald (2011) dictionary, which is compiled from thousands of firms' 10-K filings. The second measure is generated by Diction, a language processing software package widely used in the social sciences. For instance, Ober *et al.* (1999) use Diction to analyze the MD&A section of EDGAR 10-K filings while Bligh and Hess (2007) examine the market response to Federal Open Market Committee releases, congressional testimony, and speeches by the Federal Reserve Chairman. Our third measure is constructed on the basis of the Harvard Psycho-Social dictionary, which has been extensively used prior to the Loughran and McDonald (2011) word lists. For instance, Tetlock (2007) and Tetlock, Saar-Tsechansky, and Macskassy (2008) use the Harvard measure to examine negative tone in newspaper articles.

Among the three measures, the Loughran–McDonald (2011) word list is less likely to select wrong words for use in financial analysis, given its underlying source documents. In contrast, the Diction and Harvard word lists are drawn from a broader social science context and suffer from the potential word misclassification problem noted by Loughran and McDonald (2011). For example, both the Harvard and the Diction negative word lists include the word *vice*, but this word often does “no more than name... a company's vice-presidents” in 10-Ks (Loughran and McDonald, 2011). Therefore, our analysis uses conservatism based on the Loughran and McDonald (hereafter L&M) word list as our primary measure. However, for comprehensiveness of analysis, we include results using conservatism based on the other two dictionaries.

We compute our conservatism measure according to the equation below:

$$\text{Conservatism} = 100 \times \frac{\text{negative words}}{\text{total words}}. \quad (1)$$

Using the L&M, Diction, and Harvard negative word lists, we first count the number of negative words in a document. We then scale the negative word count by the total number of words in the same document. We exclude numbers and numerical tables in the count of total words. The Loughran–McDonald (2011) and Harvard negative word lists are downloaded from

their websites. The corresponding Diction words are obtained from the Diction software.

Based on Equation (1), we estimate conservatism for the entire prospectus as well as for three sections of the prospectus separately. For the separate sections, we first estimate the conservatism for the Summary section, which outlines the business of the company and offers a snapshot of the intended use for the proceeds. It also provides highlights of the income statement, balance sheet, and cash flow statement. We then calculate a conservatism measure for the Risk Factors section that contains a list of the macroeconomic and competitive uncertainties the firm faces in conducting its business. Our last measure is based on the MD&A section which contains management's discussion and analysis of the firm's projected financial conditions and the likely results of future operations.

4. Sample Construction and Data

Beginning 1 October 1998, the Securities and Exchange Commission (SEC)'s Plain English Amendment became effective.⁴ The purpose of this amendment is to enhance the readability, quality, and presentation of financial reports, including prospectuses. Among its many guidelines, the amendment requires concise sections and paragraphs, bulleted lists, and short explanatory sentences. Further, it emphasizes the need for active voice and jargon free exposition. Because our methodology uses textual analysis, we begin our sample in 1999 so that all prospectuses are prepared under the same legal requirements regarding exposition and design. We terminate our sample period in 2005 to allow for an examination of the firm's long-term operating performance and stock performance.

Our initial sample of IPOs is obtained from Thomson Financial Securities Data Company (SDC)'s New Issues database. Consistent with Hanley and Hoberg (2010) and Arnold, Fishe, and North (2010), we exclude ADR/ADSSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. A few IPOs do not raise any proceeds for the firm and are consequently excluded. We also require each IPO to be included on the Center for Research in Security Prices (CRSP) return file so that we can compute the issue's underpricing. We then manually download each of the IPO prospectuses from the SEC's EDGAR website. A few firms'

⁴ A plain English handbook can be downloaded at the website: <http://www.sec.gov/pdf/handbook.pdf>, and some description of the application of the new rules to offering prospectuses can be found at the website: <http://library.findlaw.com/1999/Jun/1/127259.html>.

prospectuses are insufficiently informative and are also excluded. We obtain a final sample of 1,100 IPOs.

5. Empirical Analysis

5.1 SAMPLE DESCRIPTIVE STATISTICS

In Table I, we provide initial descriptive statistics regarding various issue and issuer characteristics for our sample of IPOs. The underpricing for our sample averages 45.2%, but with a median value of only 17.2%. The average offer price revision is 7.7%, with a median of 5.4%. Firm size measured by either assets or sales demonstrates significant skewness. For instance, the mean value of assets for issuers is 1,031 million dollars compared with only a median value of 47 million dollars. The firms are, on average, about 13 years old before they decide to go public. Most of the issues are primary offerings, with only about 22% containing a secondary distribution. As is common, only a small percent list directly onto either the New York or American stock exchanges (15%). The average Carter–Manaster score for the lead underwriter is 8.1, with a median score of 8.5. The auditor's mean dollar market share over the past calendar year is 17%, while the average dollar market share for the issuer's and underwriter's legal counsels are 1 and 2%, respectively. About 58% of the issues are sponsored by a venture capitalist. We further observe that the mean CRSP equally weighted return for the month prior to the IPO filing is positive and is about 2.33%.

We also examine in Table I whether conservatism varies across the major sections of the prospectus. We note that the greatest mean (median) conservatism occurs in the Risk Factors section, while the Summary section demonstrates the least conservatism. This observation holds true not only for the L&M conservatism measure, but also for the Diction and Harvard conservatism measures. In addition, the L&M and Diction conservatism measures are consistently lower than the Harvard conservatism measure. The greater conservatism using the Harvard dictionary is consistent with the observation of Loughran and McDonald (2011) that the Harvard list includes many words that are not typically cautionary or negative in a financial context, such as *tax*, *cost*, *board*, *liability*, *foreign*, *vice*, *capital*, *tire*, *crude*, *mine*, and *cancer*.⁵

⁵ Among these eleven examples of inappropriate words in a financial context, only the words *vice* and *crude* are included in Diction's negative word list.

Table I. Sample descriptive statistics

The sample consists of 1,100 IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. All variables are defined in the Appendix. Sample accounting and financial data are obtained from the Thomson Financial Securities Data Company's New Issues database.

	Mean	Median	Maximum	Minimum	Standard deviation
Underpricing (%)	45.22	17.19	697.50	-33.08	75.57
Offer price revision (%)	7.65	5.41	200.00	-53.85	31.24
Filing amount (\$millions)	136.01	76.60	4,538.94	0.74	281.09
Assets (\$millions)	1,030.99	47.29	314,586.17	0.43	12,564.91
Sales (\$millions)	346.57	27.93	54,317.02	0.00	2,281.36
Age (years)	13.23	6.00	165.00	0.00	19.94
Auditor	0.17	0.17	0.46	0.00	0.08
Lawyerf	0.01	0.00	0.13	0.00	0.02
Lawyerb	0.02	0.01	0.24	0.00	0.04
Pure primary	0.78	1.00	1.00	0.00	0.41
NYSE/Amex	0.15	0.00	1.00	0.00	0.36
Carter-Manaster rank	8.07	8.50	9.00	0.50	1.40
VC-backed	0.58	1.00	1.00	0.00	0.49
CRSP return (%)	2.33	2.58	20.87	-17.93	5.74
L&M conservatism					
Aggregate	1.02	1.18	2.50	0.04	0.49
Summary	0.69	0.58	3.96	0.00	0.49
Risk	3.36	3.36	5.93	1.35	0.61
MD&A	1.11	1.05	4.61	0.16	0.46
Diction conservatism					
Aggregate	0.99	1.23	2.36	0.06	0.51
Summary	0.93	0.84	3.75	0.06	0.48
Risk	2.35	2.35	3.77	1.34	0.34
MD&A	1.43	1.39	4.27	0.45	0.44
Harvard conservatism					
Aggregate	1.83	1.81	15.48	0.06	1.31
Summary	1.61	1.51	5.54	0.25	0.66
Risk	3.40	3.39	5.04	1.88	0.47
MD&A	2.41	2.38	5.06	1.03	0.51

Table II contains a presentation of prospectus conservatism over time for our sample IPOs. Conservatism estimated across the entire prospectus seems to be stronger during the high tech bubble period of 1999–2000 than for the post-bubble period. This might be evidence of an intentional desire by issuers to increase their credibility during the exuberance of the bubble period. Alternatively, as Panel B of Table III suggests later, this might also result from a greater number of technology firms going public during the bubble period than during the post-bubble period. There is no corresponding pattern across the individual sections of the prospectus.

Table II. Distribution of conservatism scores across the sample period

The sample consists of 1,100 IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. All variables are defined in the Appendix. The “*p*-value” indicates the significance of the *F*-test under the one-way ANOVA analysis.

Year of IPO	1999	2000	2001	2002	2003	2004	2005	<i>p</i> -value
Number of IPOs	361	306	60	46	52	149	126	
L&M conservatism								
Aggregate	1.32	1.28	1.23	0.74	0.57	0.45	0.42	<0.01
Summary	0.61	0.72	0.76	0.64	0.77	0.75	0.69	<0.01
Risk	3.34	3.44	3.40	3.50	3.16	3.35	3.23	<0.01
MD&A	1.23	0.96	0.91	1.16	1.32	1.07	1.10	<0.01
Diction conservatism								
Aggregate	1.32	1.29	1.18	0.69	0.52	0.34	0.32	<0.01
Summary	0.86	0.96	0.99	0.96	1.00	1.01	0.92	<0.01
Risk	2.44	2.43	2.23	2.23	2.23	2.23	2.21	<0.01
MD&A	1.54	1.45	1.19	1.34	1.51	1.31	1.30	<0.01
Harvard conservatism								
Aggregate	2.23	2.29	2.43	1.38	0.96	0.86	0.94	<0.01
Summary	1.56	1.68	1.60	1.70	1.67	1.55	1.60	<0.01
Risk	3.31	3.51	3.48	3.47	3.34	3.37	3.38	<0.01
MD&A	2.37	2.38	2.42	2.54	2.53	2.43	2.52	<0.01

We test for industry patterns in the distribution of prospectus conservatism in Table III. In Panel A, we follow the approach of Kacperczyk, Slaim, and Zheng (2005) by consolidating the 48 industries defined by Fama and French (1997) into 10 different industry groups. We observe wide variation in the mean conservatism across these industries for the full prospectus as well as for each of the three separate sections. We find, however, that the business equipment and services industry consistently displays the greatest conservatism across the three measures. Francis, Philbrick, and Schipper (1994) report that firms in this industry are more likely to be involved in shareholder initiated litigation. Our results are consistent with the argument that issuers from industries with higher legal risk exercise greater caution in the design of their prospectuses due to concern about possible litigation. More generally, if we view prospectus conservatism as information disclosed by issuers to hedge against litigation risk, our results are also consistent with the finding of Hanley and Hoberg (2012). That is, issuer concern about litigation risk positively affects the amount of information that is disclosed in an IPO prospectus.

In Panel B of Table III we create technology and nontechnology IPO subsamples to determine if the challenges associated with valuing

Table III. Distribution of conservatism scores across industry groups

The sample consists of 1,100 IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. In Panel A, the 10 consolidated industry groupings derived from the 48 Fama and French industry classifications is used. The “*p*-value” indicates the significance of the *F*-test under the one-way ANOVA analysis. In Panel B, the Loughran and Ritter (2004) definition of technology firms is used. The “*p*-value” indicates the significance of the *t*-test. All variables are defined in the Appendix.

Industry	<i>N</i>	(1) Aggregate	(2) Summary	(3) Risk	(4) MD&A
Panel A. Industry distribution					
L&M conservatism					
Consumer nondurables	19	0.67	0.46	2.98	1.06
Consumer durables	12	0.60	0.39	3.19	1.28
Manufacturing	42	0.77	0.53	3.07	1.07
Energy	21	0.71	0.66	3.21	1.06
Business equipment and services	508	1.21	0.68	3.55	1.10
Telecom	76	0.99	0.55	2.90	1.10
Wholesale and retail	88	0.81	0.48	3.38	1.10
Healthcare	142	0.91	0.98	3.30	0.91
Utilities	8	0.82	0.62	2.60	1.03
Finance	184	0.90	0.71	3.21	1.28
<i>p</i> -value		<0.01	<0.01	<0.01	<0.01
Diction conservatism					
Consumer nondurables	19	0.63	0.80	2.14	1.27
Consumer durables	12	0.68	0.58	2.15	1.42
Manufacturing	42	0.72	0.76	2.16	1.31
Energy	21	0.72	1.04	2.41	1.12
Business equipment and services	508	1.17	0.87	2.44	1.48
Telecom	76	0.98	0.77	2.20	1.32
Wholesale and retail	88	0.82	0.80	2.35	1.43
Healthcare	142	0.84	1.40	2.26	1.34
Utilities	8	0.95	0.93	2.19	1.57
Finance	184	0.86	0.94	2.30	1.46
<i>p</i> -value		<0.01	<0.01	<0.01	<0.01
Harvard conservatism					
Consumer nondurables	19	1.38	1.44	3.40	2.45
Consumer durables	12	1.23	1.37	3.22	2.68
Manufacturing	42	1.71	1.51	3.33	2.57
Energy	21	1.27	1.68	3.51	2.60
Business equipment and services	508	2.05	1.59	3.46	2.39
Telecom	76	1.84	1.62	3.42	2.63
Wholesale and retail	88	1.60	1.35	3.47	2.48
Healthcare	142	1.83	1.83	3.29	2.21
Utilities	8	1.30	1.49	3.12	2.42
Finance	184	1.53	1.67	3.30	2.44
<i>p</i> -value		<0.01	<0.01	<0.01	<0.01

(continued)

Table III. Continued

Industry	<i>N</i>	(1) Aggregate	(2) Summary	(3) Risk	(4) MD&A
Panel B. Technology versus nontechnology IPOs					
L&M conservatism					
Technology	639	1.17	0.68	3.52	1.11
Nontechnology	461	0.82	0.70	3.13	1.10
<i>p</i> -value		<0.01	0.58	<0.01	0.95
Diction conservatism					
Technology	639	1.13	0.87	2.43	1.48
Nontechnology	461	0.80	1.01	2.24	1.35
<i>p</i> -value		<0.01	<0.01	<0.01	<0.01
Harvard conservatism					
Technology	639	2.02	1.60	3.47	2.42
Nontechnology	461	1.57	1.62	3.30	2.40
<i>p</i> -value		<0.01	0.73	<0.01	0.57

technology-based firms influence the amount of conservatism contained in prospectuses. We generally find that the level of conservatism for each of the three measures is consistently higher for technology than for nontechnology IPOs. For the Summary section, however, the conservatism levels are lower for the technology IPOs. Hanley and Hoberg (2010) argue that the Summary section is the most important section of the prospectus for marketing the IPO during the preissuance period. Our finding suggests that the issuers and underwriters of technology IPOs focus their prospectus marketing efforts in this section by exhibiting less conservatism.

Technology IPOs are more likely to be informationally opaque and to suffer from disclosure weakness. These factors, in turn, elevate the issue's litigation risk. Hanley and Hoberg (2012) report that strong disclosure is an effective hedge against lawsuits. Consistent with this result, our finding of a higher level of prospectus conservatism for technology IPOs relative to nontechnology IPOs suggests that technology issuers disclose more in their prospectuses in an attempt to hedge against potential lawsuits. Moreover, the difference between technology and nontechnology IPOs is particularly strong for the Risk Factors section, which is also consistent with issuer efforts to mitigate the possibility of litigation through risk disclosure and the inclusion of disclaimers.

In Table IV we provide a correlation analysis of the conservatism measures with key issue and issuer characteristics. We show in Panel A that L&M conservatism is significantly and positively correlated across the sections of the prospectus. Hanley and Hoberg (2010) claim that the

Table IV. Pearson correlation coefficients for conservatism and issue/issuer characteristics

The sample consists of 1,100 IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. All variables are defined in the Appendix. Statistical significance at the 1, 5, and 10% levels is denoted by ***, **, and *, respectively.

	L&M conservatism			
	Aggregate	Summary	Risk	MD&A
Panel A. Correlation between conservatism measures				
L&M conservatism				
Summary	0.20***			
Risk	0.23***	0.12***		
MD&A	0.22***	0.25***	0.10***	
Diction conservatism				
Aggregate	0.94***			
Summary		0.62***		
Risk			0.47***	
MD&A				0.65***
Harvard conservatism				
Aggregate	0.54***			
Summary		0.44***		
Risk			0.59***	
MD&A				0.42***
Panel B. Correlation between L&M conservatism and issue/issuer characteristics				
Tech				
Summary	0.22***			
Risk	0.19***	0.17***		
MD&A	0.28***	0.14***	0.13***	
Underpricing (%)	0.31***	0.04	0.11***	0.23***
Offer price revision (%)	0.28***	0.03	0.06	0.19***
Auditor	-0.19***	-0.02	0.07*	0.12***
Lawyerf	0.10***	0.08*	0.01	-0.07*
Lawyerb	-0.11***	-0.03	-0.12***	-0.05
Carter–Manaster rank	0.04	0.00	0.04	-0.01
VC-backed	0.13***	0.06	0.16***	-0.02
Ln(Filing amount)	-0.26***	-0.09**	-0.15***	-0.11***
Ln(Assets)	-0.34***	-0.12***	-0.20***	-0.14***
Ln(1 + Age)	-0.29***	0.00	-0.05	-0.03
Ln(Sales)	-0.34***	-0.12***	-0.03	0.02
Pure primary	0.27***	0.03	0.02	-0.03
NYSE/Amex	-0.22***	-0.01	-0.09**	0.02
CRSP return	0.12***	0.00	0.05	0.07*
Nontech				
Summary	0.21***			
Risk	0.07	0.09*		
MD&A	0.20***	0.35***	0.09*	
Underpricing (%)	0.16***	-0.01	0.14***	-0.05
Offer price revision (%)	0.01	-0.15***	0.04	0.00

(continued)

Table IV. Continued

	L&M conservatism			
	Aggregate	Summary	Risk	MD&A
Auditor	-0.17***	0.09*	-0.04	0.10**
Lawyerf	-0.02	0.02	-0.03	0.08*
Lawyerb	-0.02	-0.02	-0.14***	0.03
Carter–Manaster rank	0.11**	-0.09*	-0.09*	-0.08*
VC-backed	0.21***	0.20***	0.16***	-0.23***
Ln(Filing amount)	-0.02	-0.03	-0.14***	0.17***
Ln(Assets)	-0.08*	-0.09*	-0.14***	0.31***
Ln(1 + Age)	-0.15***	-0.22***	0.09**	0.14***
Ln(Sales)	-0.16***	-0.29***	-0.05	0.23***
Pure primary	0.22***	0.17***	-0.03	-0.01
NYSE/Amex	-0.13***	-0.18***	-0.18***	0.10**
CRSP return	0.04	0.07	0.09*	0.11**

prospectus' Summary section is most likely written by the underwriter, while the MD&A section is generally the work of management. The strong correlation between conservatism in these two sections suggests that the underwriters and management share common expectations about the issue. Panel A also reveals that L&M conservatism generally has a stronger correlation with the Diction rather than Harvard conservatism. As we observe later, the closer correspondence between the L&M and Diction conservatism measures is also reflected in the regression results.

In Panel B of Table IV we provide a separate correlation analysis for the technology and nontechnology subsamples. We immediately observe that there is less correlation between the conservatism expressed in the Summary and the MD&A sections of a prospectus for technology than for nontechnology IPOs. To the extent that the prospectus' Summary section is most likely written by the underwriter while the MD&A section is the work of management, this finding suggests that underwriters and management are more aligned for nontechnology than technology IPOs. Given the greater difficulties in valuing technology firms, it is reasonable to expect a greater divergence of opinion between management and underwriters in the IPOs of these firms.

We also note several interesting results regarding correlations between issue/issuer characteristics and L&M conservatism. For example, underpricing is positively correlated with conservatism, especially for technology firms. This suggests that less conservative forecasts can strengthen an IPO's offer price. The log of the filing amount and total assets are generally

negatively correlated with prospectus conservatism. This implies that larger IPOs typically display less conservatism in their prospectus.

5.2 DETERMINANTS OF ISSUER CONSERVATISM

Issuer conservatism is determined by a number of factors that we model in Equation (2). Agents such as underwriters, auditors, and attorneys exercise various legal and financial authorities over the issuer. Consequently, they are able to influence the amount of caution or exuberance that the issuer presents in the prospectus. Hence, we introduce a number of agent characteristics into our model of prospectus conservatism. Langer (1975) and Malmendier and Tate (2005) suggest that less optimism (or greater caution) is more likely when individuals feel that they have imperfect control over events. This can occur during an IPO, when the issuer is unable to fully determine investor demand, unsure of the market's receptivity to the issue, and uncertain regarding the offering's ultimate pricing. Thus, we include a set of firm/issuer characteristics as well as market conditions in our model. Conservatism can then be determined as follows:

$$\begin{aligned} \text{Conservatism}_j = & a_0 + a_1 \cdot \text{Agent characteristics}_j \\ & + a_2 \cdot \text{Firm and issue characteristics}_j \\ & + a_3 \cdot \text{Market conditions}_j + \varepsilon_j, \end{aligned} \tag{2}$$

where *Conservatism_j* is the conservatism measure for IPO *j* and is measured across each of the three sections. *Agent characteristics* include the dollar market share of the auditor, the issuing firm's legal counsel, and the underwriting firm's legal counsel in the past calendar year, and the Carter–Manaster reputation rank of the underwriting firm. *Firm and issue characteristics* consist of the log of the filing amount, log of total assets, log of sales, log of age, VC-backed binary indicator variable, and a set of binary indicator variables for pure primary offering and stock exchange. *Market conditions* variables consist of two variables. The first is the level of general issuer conservatism prevailing in the IPO firm's industry for the quarter preceding the filing. The second variable captures the return performance of the aggregate stock market and is estimated as the CRSP equally weighted return for the month prior to the IPO filing. The Appendix contains a more complete description of these variables.

Table V presents our regression results regarding the determinants of conservatism for the full prospectus and each of the three sections. The results

for each conservatism measure are distributed across three panels. Further, the analysis is presented separately for technology and nontechnology firms.

A number of results become apparent from this regression analysis. First, the coefficient on recent prospectus conservatism is uniformly positive and generally statistically significant. This finding implies that conservatism expressed by previous issuers during the preceding quarter helps to condition current issuer expectations about an IPO. That is, more recent conservatism in the marketplace tends to exert upward pressure on the level of conservatism that issuers provide in their prospectuses. The auditor's market share is generally positively related to conservatism, suggesting that participation of a reputable auditor can restrain excessive issuer optimism. However, the effect of auditor's market share on issuer conservatism does not seem to be economically significant. For example, a one standard deviation increase in the auditor's market share is associated with about a 0.05 increase in conservatism in the MD&A section for technology firms, which is equivalent to increasing one negative word in every 2,000 words. The weak effect of auditor's market share on conservatism is consistent with the argument in Herz *et al.* (1997, p. 63) that "the textual portions of the registration statement are the responsibility of the registrant and its general counsel, not the independent accountant."

The corresponding results based on the Diction conservatism measure are generally weaker. Only the coefficient for the nontechnology IPOs' Summary section is statistically significant. Similar to the results using the L&M measure, the economic magnitude of this coefficient seems to be insignificant. For the Harvard conservatism measure, none of the corresponding coefficients are statistically significant.

We further observe that the reputation of the underwriter is either negatively related to the amount of conservatism contained in a prospectus or is statistically insignificant. The negative coefficient is consistent with Fernando, Gatchev, and Spindt (2005) who report that top underwriters often limit themselves to the best IPOs coming to market. That is, if the best underwriters elect to sponsor only the strongest IPOs, then there is less need to encourage conservatism in the prospectus.

We obtain weaker results for the Diction measure. Only the coefficient for the nontechnology IPOs' MD&A section is statistically significant. Similar to the results using the L&M measure, the economic magnitude of this coefficient is not significant. The Harvard measure is unrelated to underwriter reputation, perhaps reflecting the broader sourcing of this dictionary. For the remainder of this analysis, we consider only the L&M conservatism measure since it is most suitable for finance-related research.

Table V. Determinants of issuer conservatism

The sample consists of IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. The dependent variable is conservatism measured for the full prospectus and across different sections of the prospectus. Aggregate refers to the full prospectus, and Summary, Risk, and MD&A refer to those respective sections of the prospectus. All variables are defined in the Appendix. White's (1980) standard errors, controlling for lead underwriter cluster, are used to compute *p*-values. Statistical significance at the 1, 5, and 10% levels is denoted by ***, **, and *, respectively.

Dependent variable	(1) Aggregate	(2) Summary	(3) Risk	(5) MD&A
Panel A. Determinants of L&M conservatism				
Tech				
Intercept	0.33**	0.56***	1.67***	0.34**
Recent conservatism	0.82***	0.18	0.50***	0.68***
Auditor	0.04	0.03	0.70*	0.64***
Lawyerf	2.09**	1.79	0.27	-0.82
Lawyerb	-0.46	-0.10	-1.49**	-0.55
Carter–Manaster rank	0.00	0.02	0.03	0.01
VC-backed	0.03	0.04	0.19***	-0.01
Ln(Filing amount)	0.00	-0.01	-0.01	-0.02
Ln(Assets)	-0.03**	-0.03	-0.10***	-0.03**
Ln(1 + Age)	-0.04	0.04	-0.04	-0.01
Ln(Sales)	-0.01	-0.02**	0.04***	0.02
Pure primary	0.06**	0.00	0.04	-0.01
NYSE/Amex	-0.03	0.08	0.13	0.12
CRSP return	0.04	0.06	-0.05	-0.07
Adjusted <i>R</i> ²	0.56	0.01	0.13	0.13
Nontech				
Intercept	0.18	0.60***	2.65***	0.95***
Recent conservatism	0.75***	0.17*	0.21***	0.12
Auditor	-0.03	0.73***	-0.14	0.49
Lawyerf	-0.22	-0.28	-0.19	-0.27
Lawyerb	0.35	-0.25	-1.27*	-0.36
Carter–Manaster rank	-0.01	-0.06*	-0.04*	-0.08
VC-backed	0.02	0.12***	0.21***	-0.12**
Ln(Filing amount)	0.00	0.07	0.00	0.00
Ln(Assets)	0.03	0.05**	-0.03	0.12***
Ln(1 + Age)	-0.02	-0.03	0.10***	0.02
Ln(Sales)	-0.01	-0.06***	0.03	-0.01
Pure primary	0.06	0.06	-0.09	0.06
NYSE/Amex	-0.11**	-0.14**	-0.06	-0.17*
CRSP return	0.24	0.03	0.36	0.58
Adjusted <i>R</i> ²	0.47	0.16	0.08	0.16

(continued)

Table V. Continued

Dependent variable	(1) Aggregate	(2) Summary	(3) Risk	(5) MD&A
Panel B. Determinants of Diction conservatism				
Tech				
Intercept	0.14	0.79***	1.61***	1.15***
Recent conservatism	0.92***	0.35**	0.30***	0.31***
Auditor	0.04	-0.23	0.23	0.18
Lawyerf	2.15***	0.13	-0.32	0.40
Lawyerb	-0.30	1.10**	-0.27	-0.30
Carter–Manaster rank	0.00	-0.01	0.02	0.01
VC-backed	0.03	0.02	0.09***	0.05
Ln(Filing amount)	-0.01	-0.02	-0.02	-0.02
Ln(Assets)	-0.02**	-0.02	-0.04**	-0.06***
Ln(1 + Age)	-0.02	0.03	-0.02	-0.03
Ln(Sales)	0.00	-0.03**	0.00	0.01
Pure primary	0.05*	0.03	0.10***	0.05
NYSE/Amex	-0.03	0.02	0.02	-0.10
CRSP return	-0.06	-0.09	0.32	0.31
Adjusted R^2	0.71	0.05	0.14	0.10
Nontech				
Intercept	0.32***	1.17***	2.15***	1.64***
Recent conservatism	0.78***	0.20**	0.25***	0.13
Auditor	0.03	0.79**	-0.19	0.46
Lawyerf	-0.65	-1.01	-1.48**	-1.33
Lawyerb	0.67	0.45	-0.38	-0.39
Carter–Manaster rank	-0.01	-0.04	0.00	-0.07*
VC-backed	-0.05	0.10*	-0.01	-0.02
Ln(Filing amount)	-0.02	0.00	-0.06*	-0.03
Ln(Assets)	0.03	0.02	-0.01	0.04
Ln(1 + Age)	-0.05*	-0.06	-0.03	0.02
Ln(Sales)	-0.01	-0.05**	0.00	-0.03**
Pure primary	0.05	0.12**	-0.02	0.07
NYSE/Amex	-0.06	-0.03	-0.07	-0.05
CRSP return	0.27	0.47	0.15	0.45
Adjusted R^2	0.54	0.19	0.10	0.06
Panel C. Determinants of Harvard conservatism				
Tech				
Intercept	2.81***	1.11***	1.29***	2.12***
Recent conservatism	0.44***	0.07	0.51***	0.05
Auditor	-1.03	0.17	0.17	0.05
Lawyerf	2.10	2.76*	0.03	-0.79
Lawyerb	-1.65	0.21	0.05	1.47**
Carter–Manaster rank	-0.06	0.06	0.01	-0.01
VC-backed	-0.04	0.00	0.18***	0.07*
Ln(Filing amount)	-0.13	-0.05	0.03	0.02
Ln(Assets)	-0.13**	0.03	-0.02	-0.02
Ln(1 + Age)	-0.08	0.02	-0.01	0.05*
Ln(Sales)	0.00	-0.02	0.02	0.06***
Pure primary	0.18	-0.05	0.10**	-0.07

(continued)

Table V. Continued

Dependent variable	(1) Aggregate	(2) Summary	(3) Risk	(5) MD&A
NYSE/Amex	0.39	0.00	0.06	-0.04
CRSP return	0.89	0.36	0.20	-0.07
Adjusted R^2	0.13	0.01	0.09	0.08
Nontech				
Intercept	1.67***	1.39***	2.37***	2.58***
Recent conservatism	0.36***	0.15**	0.28***	-0.10
Auditor	-0.77	0.25	-0.26	0.11
Lawyerf	-1.89	-0.56	-0.67	-0.12
Lawyerb	3.05**	0.59	-0.18	-0.28
Carter–Manaster rank	0.12	-0.02	-0.01	-0.05
VC-backed	0.16	0.16*	0.00	-0.11*
Ln(Filing amount)	-0.23***	-0.02	0.03	0.03
Ln(Assets)	-0.09	0.05	-0.03	0.02
Ln(1 + Age)	-0.06	-0.03	0.04	0.04
Ln(Sales)	0.02	-0.04	0.01	0.04***
Pure primary	0.02	0.07	-0.08	-0.04
NYSE/Amex	-0.07	-0.06	-0.08	-0.14*
CRSP return	-0.70	0.92	-0.09	0.62
Adjusted R^2	0.15	0.05	0.03	0.09

5.3 CONSERVATISM AND UNDERPRICING

As noted earlier, the effect of conservatism on underpricing is unclear. To the extent that conservatism makes the issue appear more credible and the forecasts of future firm performance more realistic, there will be greater investor demand for the issue. This implies less underpricing of the issue is required. If, however, investors view prospectus conservatism as reflecting issuer's uncertainty about the firm's prospects, then greater underpricing should be anticipated. Consequently, we test the following hypothesis:

Hypothesis 1. Greater prospectus conservatism is associated with increased underpricing.

We examine the relation between underpricing and conservatism with the following model:

$$\text{Underpricing}_j = b_0 + b_1 \cdot \text{Conservatism}_j + b_2 \cdot \text{Controls}_j + \delta_j. \quad (3)$$

Underpricing is defined as the percentage difference between the offer price and the market closing price on the first trading day. *Conservatism* is the conservatism calculated separately for the full prospectus and the Risk Factors, Summary, and MD&A sections. *Controls* refer to the vector of control variables that consist of the market shares of the auditors, issuing

firm's legal counsel, and underwriter' legal counsel, Carter–Manaster reputation rank, VC-backed binary indicator variable, log of the filing amount of the proceeds, log of total assets, log of sales, log of age, binary indicator variables for pure primary offering and the stock exchange. We also include the CRSP equally weighted return for the month prior to the IPO filing as well as year dummies.

All of the above independent variables are known much earlier in the IPO process than the offer price revision, which is only measurable on the day the shares are sold. Because the offer price revision variable is so heavily influenced by information known at the time of pricing we estimate two specifications of our underpricing regressions. Model A is limited to those variables that are measurable at the time of initial filing. Model B includes those variables as well as a measure of offer price revision. Because price revision is observable after prospectus conservatism, we rely more on Model A for examining the relation between prospectus conservatism and underpricing.

Panel A of Table VI presents a set of regression estimates between conservatism and IPO underpricing for the entire prospectus as well as across three separate sections. To facilitate reporting and interpretation, we present only the coefficients estimated for conservatism. We observe that the relation between conservatism and underpricing is generally positive. This is especially true for the technology IPOs and within the Risk Factors section of the prospectus. Thus IPOs containing more cautionary language in their prospectuses appear to require greater underpricing.

Our findings further show that the positive relation between conservatism and underpricing is stronger for technology than for nontechnology IPOs. In particular, the coefficients for the full prospectus as well as the Risk Factors and MD&A sections are statistically significant for technology IPOs, while only the coefficient for the Risk Factors section is significant for nontechnology IPOs. We provide a discussion of possible explanations for these results later in this section.

The bottom portion of Panel A in Table VI examines the relation between underpricing and conservatism with offer price revision included as a regressor (Model B). We find that the statistical significance of conservatism is generally reduced once offer price revision is included as a regressor. This is because offer price revision is strongly influenced by information known at the time of the IPO.⁶

⁶ In untabulated results, we generally observe that offer price revision is positively affected by prospectus conservatism. This is consistent with the use of a low initial price range for firms using more cautionary language in their prospectuses (Lowry and Schwert, 2004).

Table VI. L&M conservatism, underpricing, and post-IPO operating performance and stock returns

This table reports multivariate regression results for the L&M conservatism measure. The sample consists of IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. In Panel A, the dependent variable is underpricing (%). Regression model A includes the following regressors: L&M conservatism, Auditor, Lawyerf, Lawyerb, Carter–Manaster rank, VC-backed, Ln(Filing amount), Ln(Assets), Ln(1 + Age), Ln(Sales), Pure primary, NYSE/Amex, CRSP return, and year dummies. Model B includes the regressors in Model A as well as Offer price revision. In Panel B, the dependent variable is the average industry-adjusted ROA (%) for the 3 years following the IPO. Regression model A includes the same regressors as in Model A of Panel A. Model B includes the regressors in Model A as well as Lagged performance. In Panels A and B, only the coefficient on L&M conservatism is reported. White's (1980) standard errors, controlling for lead underwriter cluster, are used to compute *p*-values. Panel C presents the alpha (%) estimates from regressions of value-weighted monthly returns to portfolios buying stocks of IPOs with the most conservatism (in the top third of distribution) and shorting stocks of IPOs with the least conservatism (in the bottom third of distribution) on the four factors of Carhart (1997). Aggregate refers to the full prospectus, and Summary, Risk, and MD&A refer to those respective sections of the prospectus. All variables are defined in the Appendix. Statistical significance at the 1, 5, and 10% levels is denoted by ***, **, and *, respectively.

	Aggregate	Summary	Risk	MD&A
Panel A: Dependent variable is Underpricing (%)				
Model A: Without offer price revision				
Tech				
L&M conservatism	40.52**	9.52	17.03**	45.09***
Nontech				
L&M conservatism	−0.14	−1.10	9.45***	1.21
Model B: With offer price revision				
Tech				
L&M conservatism	16.68	4.42	12.16*	22.87
Nontech				
L&M conservatism	2.23	1.65	6.62***	1.89
Panel B: Dependent variable is Post-IPO industry-adjusted ROA (%)				
Model A: Without lagged performance				
Tech				
L&M conservatism	0.75	0.31	1.29	0.63
Nontech				
L&M conservatism	−6.89**	−3.38*	−0.45	−3.45*
Model B: With lagged performance				
Tech				
L&M conservatism	0.88	0.36	1.46	0.64
Nontech				
L&M conservatism	−5.88*	−3.65**	1.58	−3.71**
Panel C: Four-factor monthly alpha (%) (most conservatism – least conservatism)				
Tech				
α (%)	−0.52	1.16	0.53	−0.44
Nontech				
α (%)	−0.09	0.67	−0.28	−0.94*

These results survive several other robustness checks which we do not separately tabulate. First, we omit some potentially endogenous variables from the regression model, including the log of the filing amount of the proceeds, the Carter–Manaster reputation rank, and the binary indicator variables for pure primary offering and the stock exchange. Second, we replace the underwriter’s Carter–Manaster rank with the underwriter’s market share as an alternative measure of underwriter reputation. Third, we replace the log of total assets with the log of the market capitalization, which is measured as of the first trading day of the IPO. Fourth, we include the number of words in each section of the prospectus as an additional regressor. Fifth, we winsorize the conservatism variables at various levels. None of these adjustments alter our major conclusion that greater conservatism generally results in more underpricing.

The results in Panel A of Table VI do not suggest an immediate explanation of why managerial conservatism contained in the prospectus has a greater effect on the pricing of technology IPOs. We conjecture that such behavior is consistent with the argument of Dye and Sridhar (2004) that soft information will contribute more to price formation as other information becomes noisier. More specifically, the literature shows that technology firms are more difficult to value due to the inherent difficulties associated with assessing their product, process, and performance innovations. These problems in valuing new technologies result in increased noise levels for the traditional quantitative information available for these firms.⁷

5.4 CONSERVATISM AND POST-IPO OPERATING PERFORMANCE

The previous discussion establishes that issuer conservatism is related to IPO underpricing. However, it might be that the prospectus conservatism is driven by legal and marketing considerations and unjustified by subsequent performance. In this section, we test for this possibility by examining the post-IPO operating performance of our sample firms. If the prospectus’ conservatism has predictive power for the firm’s future performance, then

⁷ Alternatively, the stronger relation between conservatism and underpricing for technology IPOs also appears to be consistent with the “insurance effect” described by Lowry and Shu (2002). That is, with the perceived ex ante litigation risk being higher for technology IPOs relative to nontechnology issues, technology issuers might use greater underpricing to insure against future lawsuits.

greater conservatism should be associated with worse post-IPO operating performance. Accordingly, we test the following hypothesis:

Hypothesis 2. Prospectus conservatism is inversely related to post-IPO operating performance.

Consistent with Core, Guay, and Rusticus (2006), we use the return on assets (ROA) to measure the firm's operating performance, where ROA is defined as the firm's operating income before depreciation divided by the previous year's total assets. We then subtract the corresponding industry median value of ROA to compute an industry-adjusted ROA. We obtain the necessary accounting data from COMPUSTAT. The following regression model is estimated to determine if issuer conservatism is related to post-IPO industry-adjusted ROA:

$$\text{Industry-adjusted ROA}_j = c_0 + c_1 \cdot \text{Conservatism}_j + c_2 \cdot \text{Controls}_j + \mu_j. \quad (4)$$

The conservatism and control variables are identical to those estimated in Model A for Equation (3). We define the fiscal year in which the IPO occurs as the IPO year, which includes both pre-and post-IPO information. In our regression analysis, the dependent variable is the average industry-adjusted ROA for the 3 years following the IPO.

The top portion (Model A) of Panel B in Table VI reports the regression estimates for the L&M measure of conservatism. Again, to facilitate reporting and interpretation, we report only the coefficient for conservatism in Panel B. For technology IPOs, we find that conservatism is unable to predict post-IPO operating performance. In combination with our earlier finding of a relation between conservatism and underpricing in Panel A of Table VI, this result is consistent with several explanations. First, this might imply that conservatism for technology IPOs mostly captures the issuer's concern about litigation risk. Therefore, conservatism for technology IPOs is unrelated to post-IPO operating performance. Second, this finding might suggest that the conservatism contained in the prospectuses of technology IPOs is not appropriate. That is, the conservatism might be either excessive or insufficient depending on the issue's prospects.⁸

For nontechnology IPOs, however, we find a significantly negative coefficient for conservatism in the full prospectus as well as the Summary and MD&A sections. This suggests that conservatism for these IPOs is justified and contains information useful to investors. These different results between

⁸ The statistically insignificant result for technology IPOs might also be due to noise resulting from the construction of these measures.

technology and nontechnology IPOs imply that conservatism may serve different roles depending on the nature of the issue. That is, conservatism for technology IPOs might be designed to address concerns about litigation risk, while conservatism for nontechnology IPOs could reflect caution about the firm's future operating performance.

It is unclear, however, whether this cautionary language provides information beyond what is already observable in the prospectus' financial statements. In particular, does the prospectus' conservatism simply reflect the fact that the firm's relative accounting performance is not strong at the time of the IPO or does it have relevance for the firm's future performance?

To examine this question, we introduce controls for the *ex ante* operating performance in the regressions analysis of post-IPO operating performance. Specifically, we add the lagged industry-adjusted ROA from the first year as an additional regressor. The bottom portion (Model B) of Panel B in Table VI contains the estimates from these regressions. We find that conservatism for nontechnology IPOs in the full prospectus as well as the Summary and MD&A sections remains a statistically and economically significant predictor of the post-IPO industry-adjusted ROA. These findings suggest that conservatism for nontechnology IPOs possesses information about the firm's future operating performance beyond that implied in its current accounting disclosures.

In aggregate, these results show that the conservatism expressed within a nontechnology IPO's prospectus is justified in the sense that it helps to explain the firm's subsequent operating performance. Indeed, our results indicate that prospectus conservatism for nontechnology IPOs is related to a firm's operating performance for up to 3 years following its IPO.

5.5 CONSERVATISM AND POST-IPO STOCK RETURNS

To more firmly separate behavioral from fundamental effects in the expression of prospectus conservatism, we examine post-IPO stock returns. If prospectus conservatism excessively depresses the market price at the time of the IPO, we expect to find evidence of a stock return reversal. If, however, prospectus conservatism is informative about firm fundamentals but is not fully incorporated into the IPO's immediate aftermarket price, we expect that greater conservatism is associated with lower post-IPO abnormal returns. But if prospectus conservatism is fully incorporated into the IPO's immediate aftermarket price, then we should observe no relation between prospectus conservatism and post-IPO abnormal returns; if prospectus

conservatism is uninformative, we will also observe no relationship between it and post-IPO abnormal returns. Hence we test the following hypothesis:

Hypothesis 3. Greater conservatism is associated with lower post-IPO abnormal stock returns.

To test this hypothesis, we employ the calendar-time portfolio regression approach of Ikenberry, Lakonishok, and Vermaelen (2000). Specifically, we form portfolios of firms that have completed an IPO during 1999–2005 and place them in a portfolio for a 3-year holding period. Portfolios are rebalanced monthly to drop all the firms that have just reached the end of their holding period and to add all firms that have just completed an IPO. To investigate whether there are significant performance differences between IPO firms with different prospectus conservatism, we form a portfolio that buys IPO firms having high conservatism levels while selling those with low levels. An IPO firm is considered to have a high (low) level of conservatism if its prospectus conservatism is in the top (bottom) third of the distribution for all IPOs in the same year.

We use the Carhart (1997) four-factor model to evaluate the abnormal return. We obtain the four factors and returns on a 1-month T-bill from Kenneth French's website. To test for performance differences between IPO firms with high and low prospectus conservatism, we first calculate the difference in monthly returns between these two portfolios. This generates a time series of monthly return differences. We then regress these monthly return differences against Carhart's four factors. The estimated intercept provides the difference in alphas between the two portfolios.

Panel C of Table VI reports these results. Consistent with our analysis before, we examine technology and nontechnology IPOs separately. We observe that in most of the columns the estimated alpha is statistically insignificant, except for the MD&A section for nontechnology IPOs whose alpha (-0.94) is negative and statistically significant. This performance difference is also economically significant. This finding confirms the informativeness of conservatism in the MD&A section for nontechnology IPOs and is consistent with the results for post-IPO operating performance in Panel B of Table VI.

There can be several reasons for insignificant alphas. Therefore, we interpret the results based on our earlier findings about the post-IPO operating performance. Specifically, for technology IPOs, Panel B of Table VI shows that prospectus conservatism is unable to predict post-IPO operating performance. Accordingly, the insignificant alphas in Panel C of Table VI are more consistent with uninformative conservatism. In contrast, for nontechnology IPOs, Panel B of Table VI shows that prospectus

conservatism can predict post-IPO operating performance. Therefore, the insignificant alphas for the Summary section and the full prospectus in Panel C of Table VI are more consistent with informative conservatism and its full incorporation into the market price.⁹

5.6 DISCUSSION

These results provide useful insights regarding the nature of the text contained in a prospectus. Specifically, we find that textual conservatism is incorporated in the offer price for technology IPOs, even though it does not appear to possess predictive power for the firms' future performance. In contrast, there is evidence that conservatism is informative for nontechnology IPOs, but appears to be insufficiently incorporated into the IPO offer price. These contrasting findings suggest that when hard information is noisier, textual information is seen as having greater usefulness and is more likely to be factored into IPO pricing.

In untabulated results, we pool our sample technology and nontechnology IPOs and repeat our regression analysis. We find that prospectus conservatism is positively related to underpricing, inversely related to post-IPO operating performance, and unrelated to post-IPO abnormal stock returns. These pooled results camouflage the intriguing differences between technology and nontechnology IPOs and further justify our separate analyses for these two subsamples.¹⁰

We replicate the analysis of Table VI for the alternative Diction and Harvard measures of conservatism. The results for the Diction conservatism measure are reported in Table VII. The overall results for Diction conservatism are similar to those using the L&M measure. However, we notice an apparently counterintuitive result using the Diction measure. In particular, Panel C of Table VII shows a significantly positive alpha for Diction conservatism in the Summary section for technology IPOs. This suggests that conservatism in the Summary section excessively depresses the market price at the time of the IPO for technology firms. An alternative explanation might be termed a "mirror effect". That is, some technology IPOs might exhibit little or no conservatism in their prospectus since they are trying to inflate their share values prior to issue.

⁹ We acknowledge that the insignificant alphas in Panel C of Table VI might be due to the low power of the tests. Nevertheless, we still find a statistically significant alpha for a portfolio strategy that buys nontechnology firms with high conservatism in the MD&A section and sells those with low conservatism.

¹⁰ We thank our reviewer for suggesting this line of inquiry.

Table VII. Diction conservatism, underpricing, and post-IPO operating performance and stock returns

This table reports multivariate regression results for the Diction conservatism measure. The sample consists of IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. In Panel A, the dependent variable is underpricing (%). Regression model A includes the following regressors: Diction conservatism, Auditor, Lawyerf, Lawyerb, Carter–Manaster rank, VC-backed, Ln(Filing amount), Ln(Assets), Ln(1 + Age), Ln(Sales), Pure primary, NYSE/Amex, CRSP return, and year dummies. Model B includes the regressors in Model A as well as Offer price revision. In Panel B, the dependent variable is the average industry-adjusted ROA (%) for the 3 years following the IPO. Regression model A includes the same regressors as in Model A of Panel A. Model B includes the regressors in Model A as well as Lagged performance. In Panels A and B, only the coefficient on Diction conservatism is reported. White's (1980) standard errors, controlling for lead underwriter cluster, are used to compute *p*-values. Panel C presents the alpha (%) estimates from regressions of value-weighted monthly returns to portfolios buying stocks of IPOs with the most conservatism (in the top third of distribution) and shorting stocks of IPOs with the least conservatism (in the bottom third of distribution) on the four factors of Carhart (1997). Aggregate refers to the full prospectus, and Summary, Risk, and MD&A refer to those respective sections of the prospectus. All variables are defined in the Appendix. Statistical significance at the 1, 5, and 10% levels is denoted by ***, **, and *, respectively.

	Aggregate	Summary	Risk	MD&A
Panel A: Dependent variable is Underpricing (%)				
Model A: Without offer price revision				
Tech				
Diction conservatism	40.18**	0.41	8.34	42.45***
Nontech				
Diction conservatism	−0.99	−3.60	3.41	0.81
Model B: With offer price revision				
Tech				
Diction conservatism	20.33*	−0.71	6.74	25.38**
Nontech				
Diction conservatism	0.62	−0.33	2.11	1.41
Panel B: Dependent variable is Post-IPO industry-adjusted ROA (%)				
Model A: Without lagged performance				
Tech				
Diction conservatism	1.19	1.92	−8.01**	−1.56
Nontech				
Diction conservatism	−5.98*	−5.62***	−2.93	−5.34***
Model B: With lagged performance				
Tech				
Diction conservatism	1.14	1.87	−8.26**	−1.78
Nontech				
Diction conservatism	−5.76*	−6.11***	−1.92	−5.19***
Panel C: Four-factor monthly alpha (%) (most conservatism – least conservatism)				
Tech				
α (%)	0.53	2.03**	1.48	1.51
Nontech				
α (%)	0.27	−0.23	−0.34	−1.93***

We show later that this result for Diction conservatism is driven by the denial component of Diction conservatism. Diction's denial component includes 39 words, most of which are negation words such as no, not, nor, none, aren't, and won't. Intuitively these words would have negative implications only when negating positive words (e.g., "not profitable."). As we hand check a small sample of IPO prospectuses, however, we notice that very often the negation words are not associated with financial warning or caution. For example, "we held no investments with a maturity of greater than 12 months." "Once the product is shipped to the customer, we do not allow product returns." "The adoption of SFAS 145 has not had, nor do we believe it will have, a material impact on our current or prospective financial statements." Therefore, we find it hard to justify the denial component of the Diction measure as implying conservatism in managerial expectations at least in the context of an IPO prospectus.

To examine this issue further, we remove the denial component from the Diction conservatism word list and then re-compute it. We refer to this as the revised Diction conservatism measure. We replicate the analysis in Table VII using this revised measure and report our findings in Table VIII. Panel C of Table VIII shows that the alpha for the Summary section for technology IPOs is no longer statistically significant.

For comparison, we report the results for the Harvard conservatism measure in Table IX. Although generally weaker, the results in Table IX bear some resemblance to those in Tables VI and VIII. The weaker results for the Harvard measure are consistent with the argument by Loughran and McDonald (2011) that word misclassification adds to the noise in any textual analysis. That is, to the extent that the Harvard word list contains entries whose meanings are distant from a business or finance context, such inclusion will attenuate regression coefficients and weaken any statistical analysis.

6. Conclusion

Previous researchers such as Beatty and Ritter (1986), Arnold, Fishe, and North (2010), and Hanley and Hoberg (2010, 2012) establish the information content of IPO prospectuses for understanding IPO pricing. But this literature largely ignores soft or textual information that can be conveyed by the tone of the prospectus.¹¹ We address this omission by examining the level of conservatism revealed by the IPO issuer in the prospectus.

¹¹ A notable exception is Table 11 in Hanley and Hoberg (2010).

Table VIII. Revised Diction conservatism (removing the denial component), underpricing, and post-IPO operating performance and stock returns

This table reports multivariate regression results for the revised Diction conservatism measure. The sample consists of IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. In Panel A, the dependent variable is underpricing (%). Regression model A includes the following regressors: Revised Diction conservatism, Auditor, Lawyerf, Lawyerb, Carter–Manaster rank, VC-backed, Ln(Filing amount), Ln(Assets), Ln(1 + Age), Ln(Sales), Pure primary, NYSE/Amex, CRSP return, and year dummies. Model B includes the regressors in Model A as well as Offer price revision. In Panel B, the dependent variable is the average industry-adjusted ROA (%) for the 3 years following the IPO. Regression Model A includes the same regressors as in Model A of Panel A. Model B includes the regressors in Model A as well as Lagged performance. In Panels A and B, only the coefficient on revised Diction conservatism is reported. White’s (1980) standard errors, controlling for lead underwriter cluster, are used to compute *p*-values. Panel C presents the alpha (%) estimates from regressions of value-weighted monthly returns to portfolios buying stocks of IPOs with the most conservatism (in the top third of distribution) and shorting stocks of IPOs with the least conservatism (in the bottom third of distribution) on the four factors of Carhart (1997). Aggregate refers to the full prospectus, and Summary, Risk, and MD&A refer to those respective sections of the prospectus. All variables are defined in the Appendix. Statistical significance at the 1, 5, and 10 levels is denoted by ***, **, and *, respectively.

	Aggregate	Summary	Risk	MD&A
Panel A: Dependent variable is Underpricing (%)				
Model A: Without offer price revision				
Tech				
Revised Diction conservatism	83.69***	0.24	13.33	55.70***
Nontech				
Revised Diction conservatism	0.42	−0.85	4.97	1.34
Model B: With offer price revision				
Tech				
Revised Diction conservatism	44.22**	0.31	6.91	36.16**
Nontech				
Revised Diction conservatism	3.39	0.86	2.13	1.04
Panel B: Dependent variable is Post-IPO industry-adjusted ROA (%)				
Model A: Without lagged performance				
Tech				
Revised Diction conservatism	−0.97	1.26	−7.83*	−1.97
Nontech				
Revised Diction conservatism	−8.63*	−4.80**	2.04	−3.35*
Model B: With lagged performance				
Tech				
Revised Diction conservatism	−0.33	1.36	−7.47	−1.90
Nontech				
Revised Diction conservatism	−8.12*	−5.36**	3.01	−3.61*
Panel C: Four-factor monthly alpha (%) (most conservatism – least conservatism)				
Tech				
α (%)	0.05	−0.58	2.10	−0.62
Nontech				
α (%)	0.06	0.18	−0.80	−1.57**

Table IX. Harvard conservatism, underpricing, and post-IPO operating performance and stock returns

This table reports multivariate regression results for the Harvard conservatism measure. The sample consists of IPOs from 1999 to 2005, excluding ADR/ADSs, units, REITs, closed-end funds, limited partnership, and IPOs with an offer price of less than 5 dollars. In Panel A, the dependent variable is underpricing (%). Regression Model A includes the following regressors: Harvard conservatism, Auditor, Lawyerf, Lawyerb, Carter–Manaster rank, VC-backed, Ln(Filing amount), Ln(Assets), Ln(1 + Age), Ln(Sales), Pure primary, NYSE/Amex, CRSP return, and year dummies. Model B includes the regressors in Model A as well as Offer price revision. In Panel B, the dependent variable is the average industry-adjusted ROA (%) for the 3 years following the IPO. Regression Model A includes the same regressors as in Model A of Panel A. Model B includes the regressors in Model A as well as Lagged performance. In Panels A and B, only the coefficient on Harvard conservatism is reported. White's (1980) standard errors, controlling for lead underwriter cluster, are used to compute *p*-values. Panel C presents the alpha (%) estimates from regressions of value-weighted monthly returns to portfolios buying stocks of IPOs with the most conservatism (in the top third of distribution) and shorting stocks of IPOs with the least conservatism (in the bottom third of distribution) on the four factors of Carhart (1997). Aggregate refers to the full prospectus, and Summary, Risk, and MD&A refer to those respective sections of the prospectus. All variables are defined in the Appendix. Statistical significance at the 1, 5, and 10% levels is denoted by ***, **, and *, respectively.

	Aggregate	Summary	Risk	MD&A
Panel A: Dependent variable is Underpricing (%)				
Model A: Without offer price revision				
Tech				
Harvard conservatism	5.46	5.37	11.04	3.11
Nontech				
Harvard conservatism	−1.03	−0.16	5.87**	1.43
Model B: With offer price revision				
Tech				
Harvard conservatism	2.72	5.31	10.97	7.17
Nontech				
Harvard conservatism	0.25	1.23	4.46**	2.72*
Panel B: Dependent variable is Post-IPO industry-adjusted ROA (%)				
Model A: Without lagged performance				
Tech				
Harvard conservatism	0.16	1.86	−1.55	−1.52
Nontech				
Harvard conservatism	−1.93	−2.46*	−1.14	−0.66
Model B: With lagged performance				
Tech				
Harvard conservatism	0.08	1.90	−1.47	−1.73
Nontech				
Harvard conservatism	−2.09	−2.72**	−0.26	−0.79
Panel C: Four-factor monthly alpha (%) (most conservatism – least conservatism)				
Tech				
α (%)	−0.15	0.60	−0.58	0.55
Nontech				
α (%)	0.28	0.69	−0.85	0.68

In this study, we estimate the degree of conservatism that an issuer reveals about the firm in its prospectus. We then examine how this conservatism influences the pricing process of an IPO by calculating its effect on the issue's underpricing. We further test if this conservatism has explanatory power for the firm's future operating performance and stock returns.

We find that increased conservatism in the full prospectus and the Risk Factors and MD&A sections of the prospectus is significantly related to greater underpricing. We observe that this relation is stronger for technology than for nontechnology IPOs. Further, we establish that prospectus conservatism for nontechnology IPOs contains useful information about the firm's future operating performance. Finally, we find a significant and negative relation between the conservatism in the MD&A section and post-IPO abnormal stock returns for nontechnology IPOs, suggesting that stock prices do not sufficiently incorporate the information in conservatism immediately.

Our results also indicate some influence by other parties in the amount of conservatism expressed in a prospectus. We find that auditor stature is positively related to prospectus conservatism. This suggests that more reputable auditors tend to encourage issuer conservatism, perhaps in response to reputation concerns and liability. We find limited evidence that underwriter reputation negatively influences the conservatism displayed in a prospectus. This is consistent with the view that high-quality underwriters limit themselves to the strongest IPOs, thus making it easy for them to be optimistic about the issue. However, neither the auditor's nor the underwriter's influence is economically significant.

The findings of this study add to the new and growing literature using textual analysis (e.g., Demers and Vega, 2008; Davis, Piger, and Sedor, 2008; Doran, Peterson, and Price, 2009; Doran, Peterson, and Price, 2009; Rogers, Van Buskirk, and Zechman, 2011) and have important implication regarding future research on new issues. The soft information contained in a prospectus is useful for a fuller understanding of pricing in IPOs and the subsequent operating and stock return performance of IPOs.

Appendix: Definition of Variables

L&M conservatism is computed as $100 \times \text{Fin-Neg} / \text{total words}$, where Fin-Neg is from the Loughran–McDonald (2011) dictionary.

Diction conservatism is computed as $100 \times (\text{blame} + \text{hardship} + \text{denial}) / \text{total words}$, where blame, hardship, and denial are from the Diction software's dictionaries.

Revised Diction conservatism is computed as $100 \times (\text{blame} + \text{hardship}) / \text{total words}$, where blame and hardship are from the Diction software's dictionaries.

Harvard conservatism is computed as $100 \times \text{negativity} / \text{total words}$, where negativity is from the Harvard Psycho-Social dictionary.

Recent conservatism is the average conservatism measure for all IPOs in a specific consolidated industry grouping filed during the 90-day period preceding the initial filing of a sample IPO within that industry grouping.

Aggregate is the conservatism measure for the full prospectus.

Summary is the conservatism measure for the summary section of the prospectus.

Risk is the conservatism measure for the risk factors section of the prospectus.

Discussion is the conservatism measure for the MD&A section of the prospectus.

Underpricing is calculated as $(\text{Closing price on the first trading day of IPO} - \text{Offer price}) / \text{Offer price}$.

Offer price revision is calculated as $(\text{Offer price} - \text{Midpoint of the original file price range}) / \text{Midpoint of the original file price range}$.

Auditor is the auditor's dollar market share in the past calendar year.

Lawyerf is the issuing firm's legal counsel's dollar market share in the past calendar year.

Lawyerb is the underwriting firm's legal counsel's dollar market share in the past calendar year.

Filing amount is estimated as the average filing price multiplied by the number of shares to be sold as indicated in the initial filing (in millions of 2005 dollars purchasing power). $\text{Ln}(\text{Filing amount})$ is the natural logarithm of Filing amount.

Assets is calculated as the total assets before offering (in millions of 2005 dollars purchasing power). $\text{Ln}(\text{Assets})$ is the natural logarithm of Assets.

Sales is calculated as the sales during the 12 months prior to the IPO (in millions of 2005 dollars purchasing power). $\text{Ln}(\text{Sales})$ is the natural logarithm of Sales.

Age is estimated as the IPO year—founding year. Founding years are downloadable from Jay Ritter's website. $\text{Ln}(1 + \text{Age})$ is the natural logarithm of one plus Age.

VC-backed is an indicator variable that equals one if the firm is venture capitalist backed, and zero otherwise.

Carter–Manaster rank is the IPO lead underwriter reputation ranks that are downloadable from Jay Ritter's website at <http://bear.cba.ufl.edu/ritter/Rank.htm>. It assigns higher prestige to underwriters that are listed more

prominently on tombstone advertisements. The reputation ranks range from 1 (lowest) to 9 (highest). When an IPO has multiple lead underwriters, the average reputation rank is used.

Pure primary is an indicator variable that equals one if the offering is 100% primary (i.e., no secondary shares sold), and zero otherwise.

NYSE/Amex is an indicator variable that equals one if the IPO stock is listed on NYSE or Amex, and zero otherwise.

CRSP return is the equal-weighted CRSP return over the month prior to the IPO filing date.

Industry-adjusted ROA is the ROA less industry median ROA, where ROA is defined as the firm's operating income before depreciation divided by the previous year's total assets.

Lagged performance is the lagged industry-adjusted ROA from the first year after the IPO.

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