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Paper Title: Determinants of corporate tone in the initial public offering: Powerful CEOs versus well-functioning boards

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Determinants of corporate tone in the initial public offering: Powerful CEOs versus well-functioning boards

Abstract

This paper studies the prospectus used during an initial public offering (IPO) and its role in reducing information asymmetry between buyers and sellers. The recent IPO literature suggests a significant effect of tone in IPO underpricing but is silent about its determinants. This study concentrates on the factors that shape the tone of the information disclosed in IPOs. Using a sample of 188 Latin American IPOs during the period 2000 – 2014, we find empirical evidence that a powerful CEO can influence tone, avoiding unfavorable tone and fostering the use of positive words in the information disclosed to the market. We also show that boards that are more independent tend to use a more unfavorable tone. In addition, we find a non-monotonic relationship between board size and the tone in the prospectus, which suggests an optimal board size that mitigates the excessive use of positive tone and leads to use of a more unfavorable tone in the IPO prospectus. Overall, well-functioning boards counterbalance powerful CEOs and generate a more realistic disclosure to the market. Finally, we found that market-dominant auditors, age of the issuing firm, proposed use of proceeds, and the number of risk factors significantly affect the tone in information disclosed through the prospectus.

Introduction

Agency problems become greater once the entrepreneur decides to sell some part of the firm to outsiders (Jensen & Meckling, 1976). Specifically, when a firm decides to go public via a primary share offering, adverse selection and moral hazard problems may arise. An initial public offering (IPO) is a very important moment in the life of a firm as it results in the separation of ownership and control. This separation can affect both the way investors value the IPO (over or under valuation) and the future performance of the firm. The problems are associated with information asymmetries between insiders and outside investors and the alignment of interest between managers and shareholders.

These problems are a major concern in Latin America when considering the role development of capital markets plays in economic growth (Levine, 2005). The region has lagged behind others in terms of regulatory environment and shows poor development of its capital markets compared to others. This fact might force firms to develop signaling mechanisms to attract capital from investors (Chong & Lopez-de-Silanes, 2007). Corporate governance, and specifically information disclosure, can be used by firms to reduce information asymmetry and obtain better asset valuation, thus compensating for a weak institutional environment and poor investor protection (La Porta, Lopez-de-Silanes, & Shleifer, 2006).

In addition, recent research has shown that not only the level of information disclosure but also the tone used in corporate communications matters to firm valuation. For example, Loughran & McDonald (2013) and Brau et al. (2016) for the U.S case and González et al. (2019a) for the case of Latin America found a direct relationship between tone in the IPO prospectus and underpricing. Specifically, González et al. (2019a) show that tone matters independently of firms' governance structures.

In addition, González et al. (2019b) find that tone in annual reports also impacts firm value. And yet, despite the relevance of tone for valuation, little is known about its determinants.

In this paper, using a sample of 188 Latin American IPOs during the period 2000 – 2014, we first follow an empirical approach to obtain a descriptive analysis of the language in the prospectus via the identification of patterns in texts. We are interested in the manifestation of language in its written form as a proxy for meaning. In addition, in a multivariate analysis setting, we study the determinants of tone in IPO prospectuses.

Performing the descriptive analysis of the language in an IPO prospectus, we first choose the most relevant sections in terms of qualitative information; these are the summary and risk factors sections. Other elements of the IPO prospectus, such as the financial sector and other firms' specific data, an industry overview, ownership structure, and glossary, among other parts, convey more factual and quantitative information, are less heterogeneous, and therefore are less informative in terms of tone.

As expected, unfavorable tone is greater in the risk factor section than in the summary section; and the reverse is true for our measure of positiveness in tone. An investor reading the summary section will find a more positive tone regarding the firm's IPO than an investor reading only the risk factor section. Hence, our analysis shows that these two sections differ in terms of tone within the same prospectus. In addition, an analysis of the risk factors section across different prospectuses, did not show significant differences in tone, which suggests that firms convey this type of information to the market in standard ways. Therefore, consistent with previous literature (González et al., 2019a; Ferris et al., 2013; Hanley & Hoberg, 2010), we can conclude that the most informative part of the prospectus is the summary section.

Regarding the determinants of tone in our multivariate analysis, and using the measures of tone in the summary section as our dependent variables, we find that powerful CEOs (those who are also chairman of the board) avoid unfavorable tone and foster the use of positive language in the information disclosed to the market. Although it could be argued that any CEO will use positive words to promote their firms, from the agency perspective, CEO duality is a proxy of CEO entrenchment. Entrenched, powerful CEOs have more private benefits to lose if investors significantly underprice the IPO, leading to a potential CEO turnover. Hence, powerful CEOs are understandably more prone to use a positive tone with less uncertainty in the IPO prospectus.

In terms of corporate governance structure, we show that more independent boards lead to the use of a more unfavorable tone in the information released through the IPO prospectus to investors but have no effect on the positivism of this information. In addition, we show a non-monotonic relationship between board size and the prospectus tone, which suggests an optimal board size that allows the firm to avoid an excessively positive tone in the IPO prospectus and to use a more unfavorable (realistic) tone in the process of disclosing information. Overall, well-functioning boards counterbalance powerful CEOs in the preparation of IPO prospectuses in a more accurate and conservative way. We also report that market-dominant auditors, age of the issuing firm, proposed use of proceeds, and the number of risk factors in the prospectus significantly affect the tone in the information disclosed.

This paper contributes to the growing literature regarding tone in corporate communications in the field of financial economics (Loughran & McDonald, 2013; Ferris et al., 2013; Brau et al., 2016; and González et al., 2019a,b). As far as we know, this is the first paper to analyze the determinants of tone in corporate communications by specifically using the IPO prospectuses. In addition, we show the tension between the boards and powerful entrenched CEOs in the context of the information disclosed in the IPO prospectus, highlighting the relevance of a proper balance of power in corporate governance at the firm level to guarantee more accurate information for outside investors.

The rest of this paper is organized as follows. We first review the literature and develop our main hypotheses, discussing the relationship between governance variables at the firm level and the tone in IPO prospectuses. Next, we describe the data used and perform a linguistic analysis of how much is said and what is meant. We then analyze the determinants of tone in Latin American IPO prospectuses. Finally, we conclude.

Corporate governance at firm level and tone in IPOs prospectuses

Transparency practices, and hence corporate communications, are a key component of corporate governance (Morey et al., 2009; OECD, 2015; Patel, Balic, & Bwakira, 2002). Therefore, the quantity and the quality of information that the firm reveals to the market, as well as the tone used in this process, could be affected by corporate governance arrangements at the firm level. In addition, there is a natural tension between the board of directors and the CEO, attributable to the supervising role of the board (Fama & Jensen, 1983; Weisbach, 1988). Hence, in this section we discuss hypotheses regarding the impact of powerful, entrenched CEOs as well as well-functioning boards on the tone used in IPOs prospectuses, as an important channel of firm communication to outside investors.

Good governance practices are put in place to mitigate conflicts of interest and create a proper balance of power among different actors in firms' decision-making process. On one hand, agency theory states that boards must be independent from management to properly oversee CEO performance (Jensen & Meckling, 1976; Fama & Jensen, 1983). On the other hand, stewardship theory suggests that unity of command under unambiguous leadership could send strong signals to insiders and outsiders about managerial efficiency (Donaldson & Davis, 1991; Pfeffer & Salancik, 1978). The balance of power between the board and the CEO is overturned when the CEO heads the board as chairperson.

The literature has not settled on the net effect of CEO duality on firm performance and scholars still debate whether the prevalent effect comes from entrenchment or efficiency theories (Krause et al., 2014; Finkelstein, & D'Aveni, 1994). However, regardless of the net effect, the literature agrees that the balance of power inclines toward CEOs in this governance arrangement, making them more powerful (Finkelstein, 1992).

According to Shleifer & Vishny (1989), powerful and entrenched CEOs get private benefits of control, such as higher salaries, larger perquisites, and greater influence regarding corporate strategy, among other perks. In the IPO setting, and in particular in assembling the IPO prospectuses, all CEOs have incentives to present their firms in the best possible way. However, an entrenched and powerful CEO with relevant private benefits at risk will have even stronger incentives to use a positive tone in writing the IPO prospectus.

The literature has shown that tone affects the outcome of the IPO process (Loughran & McDonald, 2013; Ferris et al., 2013; Brau et al., 2016). In the case of Latin America, González et al. (2019a) demonstrate that an unfavorable tone in the IPO prospectus affects the level of underpricing independently of the firm governance structure. In addition, González et al. (2019b) report that positiveness (uncertainty) in the tone of corporate communications is positively (negatively) related to firm valuation in Latin America. Hence, tone in corporate communication is a major concern when delivering information to outsiders.

The IPO process increases exposure to market discipline, and a successful system of corporate governance penalizes managers who deliver poor results (Coffee, 1999). Hence, an unsuccessful IPO increases the probability of CEO dismissal and loss of private benefits of control. This leads us to test the following hypothesis:

Hypothesis 1. Powerful, entrenched CEOs tend to use an overly optimistic tone in IPO prospectuses.

Well-functioning boards seems to be characterized by their independence (Fama & Jensen, 1983). This is consistent with the theoretical and empirical literature (Nguyen & Nielsen, 2010; Dahya, Dimitrov, & McConnell, 2008; Dahya, McConnell, & Travlos, 2002) and with governance regulations and guidelines (e.g., the Sarbanes-Oxly Act, Cadbury Committee). For example, Dahya et al. (2002) show that with implementation of the Cadbury Committee code of good governance practices in the U.K. in 1992, which strongly recommended the inclusion of at least 3 independent directors on boards, the CEO turnover/performance sensitivity got stronger. This suggests more effective supervision by boards. In addition, Chhaochharia & Grinstein (2009) analyze the effect of the Sarbanes-Oxley Act on CEO compensation. This act requires that members of compensation, audit, and nominating committees be independent in U.S. listed firms. The authors show a 17 percent decrease in CEO compensation after the rules went into effect, an indication of the power of independent directors in monitoring CEOs.

Nguyen & Nielsen (2010) estimate the value of independent directors by studying the sudden death of more than 200 directors, finding a 0.85 percent drop in firms' stock prices on average. Black and Kim (2012) provide evidence regarding the relevance of board independence for firm value in emerging economies. In addition, a cross-country study by Dahya et al. (2008) shows that board independence is positively related to corporate value, especially in countries with weak legal protection for shareholders. The literature generally agrees that independent directors create value for shareholders.

The literature also argues that independent directors are good monitors because they care about their reputation. In general, "directors seek to develop their reputation in order to gain more board seats and thereby obtain prestige, power, compensation, and access to valuable networks" (Levit & Malenko, 2016:775). Clarkson, Craswell & Mackenzie (2008) show that the initial bid premium in a takeover process increases with the presence of independent directors. According to these authors, independent directors try to achieve the best deal for shareholders while thinking about the effect of the transaction on their reputation. In addition, in the context of the Venezuelan banking crisis, Garay, González & Molina (2007) report an increase of independent directors on the boards of banks that survived the financial crisis. This suggests that the market rewards independent directors who maximize firm value, even in emerging economies.

We expect an independent board to counterbalance the excessive optimism of the CEO in disclosing information to outside investors during an IPO process. Chahine & Filatotchev (2008) state that independent directors may be perceived by minority investors as particularly relevant in restraining managerial opportunism and that board independence provides monitoring and certification of the issuing firm's quality. They also argue that board independence should mitigate agency problems between the issuing firm and its investors. If the presence of independent directors constrains managerial opportunism, then it can also restrain misleading disclosure (Leone, Rock, & Willenborg, 2007). Armstrong, Core, & Guay (2014) demonstrate that independent directors reduce firms' opacity.

In this same line, Bertoni, Meoli, & Vismara (2014) argue that the role of the board of directors in the IPO process becomes crucial not only in terms of value protection but also in terms of value creation. For young innovative firms initiating an IPO process, board directors, and especially, independent directors, provide strategic guidance in the preparation of the prospectus. Considering these arguments, we posit the following hypothesis:

Hypothesis 2. Boards that are more independent tend to avoid an overly optimistic tone in IPO prospectuses.

Another corporate governance characteristic of well-functioning boards closely studied in the literature is board size. On one side of the spectrum, Yermack (1996) argues and empirically shows that small boards are more effective in the decision-making process. He reports an inverse relationship between size and firm value, arguing that even though bigger boards could have more capacity to supervise management, this benefit is outweighed by the potential for free riding problems along with less stringent CEO performance evaluations and less willingness to take risks. Outside the U.S., Eisenberg, Sundgren & Wells (1998) confirm Yermack's findings using a sample of substantially smaller Finnish firms. Eisenberg et al. state that studies of board size effects in smaller firms are important because the determinants that affect their choices could differ from those in large public firms.

On the other side of the spectrum, Cheng (2008) argues that larger boards are associated with lower variability of financial performance and that incorporating the variability of financial metrics is another way to evaluate board performance. The argument is constructed from the fact that although larger firms tend to take more time to reach consensus and could have coordination problems, once a decision is made it tends to be less extreme since the decision process incorporates the more diverse views of a larger group of individuals. In the same vein, Boone et al. (2007) show empirically that board size is a function of the tradeoff between effectiveness of the decision-making process and the cost of supervising the CEO. They argue that larger and older firms with high free cash flows and industry concentration should have larger boards, while firms with concentrated CEO ownership, rapid growth, high R&D expenses, and considerable variance in their returns, should benefit from smaller boards.

This discussion seems to indicate that there is an optimal board size depending on a firm's characteristics and stage in its life cycle. For example, Coles, Daniel & Naveen (2008) show that complex firms, where the advisory role is more prevalent, tend to have bigger boards composed mainly of outside investors, but the relation is not monotonic. The U-shape relation seems to indicate that in certain circumstances (for complex firms) a big board maximizes shareholder value, but for less complex firms small boards are better suited to enhance value. Looking at banks' boards, De Andres & Vallelado (2008) also find a non-monotonic relationship between board size and performance. They argue that the tradeoff between the need to monitor and advise the CEO shapes board structure.

The monitoring and advising roles of boards are also apparent in the firms' different disclosure and transparency processes, like the one associated with an IPO. In addition, although it is not clear if large or small boards lead to less opacity, empirical evidence suggests that board size has an impact on the level of firms' disclosure. Chiang & He (2010) and Torchia & Calabrò (2016) find that board size affects the degree of firms' transparency. However, while Chiang and He show that large board size relates to high transparency, Torchia and Calabrò find the opposite; that is, a negative relationship between board size and the level of financial transparency and disclosure.

We argue that board size could also be a determinant of board effectiveness in performing tasks associated with preparing the IPO. Small boards could lack enough expertise and diversity, while large boards could suffer coordination and free riding problems. Hence, boards that are too small or too large could fail in advising and supervising management in the disclosure process and writing the IPO prospectus. Former arguments suggest that an optimal board size will imply a more realistic and conservative tone in the IPO prospectus, as stated in the following hypothesis:

Hypothesis 3. There is an optimal board size that makes firms more effective in avoiding an overly optimistic tone in IPO prospectuses.

Analysis of tone in Latin American IPOs

Our data is described in Table 1. The full sample is based on information collected from the period 1990-2014 and is composed of 396 prospectuses: Argentina (27), Brazil (219), Chile (31), Colombia (15), Mexico (91), and Peru (13). In Panel A, we describe the filtering process. We hand-collected each pdf file from databases such as Bloomberg and Thompson, and stock exchange web pages. After deleting 77 IPOs reported as withdrawn, 13 pending and 2 postponed, we have 242 IPOs reported as trading. We were unable to find 49 prospectuses electronically; hence, we finally collect and process 193. The prospectuses come from the six Latin American countries with higher market capitalization in the region (Table 1, Panel B).

The time period 2000–2014 is chosen given that these prospectuses are more homogeneous in their structure and electronic access to these files is more reliable for this period. Table 1, Panel C, shows the evolution of IPOs for the period under study.

[INSERT TABLE 1 HERE]

How much do they say?

There are mainly three agents participating in an initial public offering: the firm issuing the asset, the underwriter, and the investor. Other external agents are auditing firms, law firms and advisors. In Latin America, 95 percent of the IPOs under study were audited by one of the top five international auditing firms[1]. For the period 2000 - 2014, these were PricewaterhouseCoopers, Deloitte Touche, KPMG, Ernst and Young and RSM McGladrey. The issuer is usually in charge of drafting the prospectus with the guidance of a bank responsible for due diligence (business, financial, and legal) as well as being for definition of the IPO characteristics, offer marketing and roadshow.

The prospectus is central to the marketing of the offer. Its main task is to convey the information needed in the investment decision process. It is important to recognize that market institutions usually shape the structure of the prospectus. Although there are observed differences, in general they have the following structure: a) introduction, b) definitions, c) glossary, d) presentation of financial information, e) company summary, f) offer summary, g) financial statements summary, h) information about the offer, i) company registration (address, branches, consultants, auditors, etc.), j) risk factors, k) use of proceeds, l) general information about the company.

Since some subsections in the prospectus provide fact-based information (e.g., definitions, glossary, financial statements) we decided to work with the two most relevant sections in terms of the signals the issuing firm is trying to convey to the market, specifically in the company summary and risk factors sections. Other authors such Ferris et al. (2013), Hanley and Hoberg (2010) have also recognized these two sections as the most important in the prospectus. The summary presents general information about the company such as vision, strengths, market opportunities, strategies, organizational structure, etc. Risk factors comprise another important section and is dedicated to explaining the risks associated with the offering. These are usually classified as relative to the business, industry, country, and operation.

The prospectus can be huge in terms of number of pages. For the Latin American case, the files studied average 419 pages. The biggest prospectus in our sample in terms of pages numbered 1372 and the shortest, 48[2]. The number of risk factors

[1] The ranking was taken from Inside Public Accounting (IPA) special reports for the years 2000- 2014. IPA publishes firm rankings and benchmarking reports on the largest 300 accounting firms in the U.S. For more details visit www.insidepublicaccounting.com.

[2] The largest prospectus in terms of pages was presented by the Brazilian company "CPFL Energias Renovaveis S.A." and the smallest by the Chilean company "Salfacorp S.A."

reported by Latin American firms goes from a minimum of 3 to a maximum of 66, with an average of 26. The information disclosed must be written in a clear and understandable way according to law[3].

After tokenizing[4] the summary and risk factor sections, we found that the average number of words is 495 and 217, respectively. In Appendix 1 we present the most frequent words in these sections for Brazilian and non-Brazilian IPOs respectively. Following González et al. (2019a,b), we use the weak-modal, negative, and uncertain word lists proposed by Loughran & McDonald (2011) to measure tone in the summary section of each prospectus. The first step is to create a document corpus and then remove all characters not relevant to measuring the tone, such as punctuations characters, dates, and numbers. We follow the standard practice of putting all words in lowercase and removing white space. Finally, we use the word lists as parameters to score each prospectus on the basis of term frequency - inverse document frequency. We then create a new list, named "unfavorable tone," which combines the three lists since they all proxy the same attribute - uncertainty (Loughran & McDonald, 2013). We also keep the positive dictionary from Loughran & McDonald (2011) to measure positiveness in tone.

In Table 2, Panels A and B, we show the top ten most frequent words in the uncertain, weak modal, negative (uwn) category for Brazil (Panel A) and the other countries (Panel B). For the risk factor section in Brazil, excepting the word "riscos", the most repeated uwn word is "adversamente", which appears 1940 times in the corpus, followed by "redução" and "negativamente", appearing 742 and 712 times, respectively. In the summary section, the most uwn repeated word is "aproximadamente", appearing 799 times in the corpus and followed by "riscos" and "redução", which appear 566 and 268 times, respectively. Four uwn words are present in both sections ("aproximadamente", "riscos", "redução", "processos"). The word "riscos" is the most frequent in both sections, appearing 3520 times, an average of 26 times per prospectus.

For the risk factor section in countries other than Brazil, the most repeated uwn word is "podría", appearing 1723 times in the corpus and followed by the word "puede", which appear 679 times. The presence of weak modal verbs such as these and others ("depende", "posible", etc) are written representations of the level of uncertainty associated with the offer. We observe these phenomena in prospectuses written in both Portuguese and Spanish. In the summary section, the most uwn repeated

[3] In the U.S. for example, sections must follow "plain English principles". This implies the use of short sentences; concrete, everyday language; active voice; no double negatives and avoidance of puffery. More on this can be found in the NYSE IPO guide rules and procedures for North America. For prospectuses written in Portuguese and Spanish, as is the case in Latin America, IPO issuers can follow the rules and procedures suggested in the exchange.

[4] Manning et al. (2008) define tokenization as chopping a character sequence up into pieces, called tokens and throwing away certain characters such as punctuation.

word in the countries other than Brazil is “aproximadamente”, which appears 170 times and also ranked first in Brazilian IPOs. This word is followed by others such “diferentes”, “riesgo” and “escala”.

In Table 2, Panels C and D, we show the top ten most frequent words to the positive category for Brazil (Panel C) and the other countries (Panel D). For the risk factor section in Brazil, the most repeated positive word is “bem”, appearing 1299 times in the corpus followed by “aumentar” and “maior”, which appear 535 and 506 times, respectively. In the summary section, the most positive repeated word is “maior”, appearing 969 times in the corpus followed by “bem” and “oportunidades” appearing 705 and 628 times, respectively. Six positive words are present in both sections (“maior”, “bem”, “oportunidades”, “alta”, “aumentar”, “superior”).

For the risk factor section in countries other than Brazil, the most repeated positive word is “capacidad” appearing 671 times in the corpus followed by “asegurar”, appearing 307 times. In the summary section, the most positive repeated word is “mayor”, appearing 174 times. This word is followed by “capacidad” (165), “oportunidades” (120) and “permite” (120). Five positive words are present in both sections (“mayor”, “capacidad”, “aumento”, “eficiencia”, “importante”).

[INSERT TABLE 2 HERE – available upon request due to lack of space]

Measuring tone. What do they mean to say?

We apply the rule-based approach as our information retrieval method in order to score firms on the basis of linguistic events. In addition, we apply cosine similarity to analyze the tone heterogeneity between and within prospectuses. We explore the occurrence of terms in a corpus of prospectuses as a way of measuring the tone used in the process of marketing the IPO.

Following the literature in information retrieval, we use a rule-based classifier to measure tone in both sections. Prospectus scoring is as follows. As explained before, we create a corpus of prospectuses by removing undesirable characters. Then we create a document term matrix for the risk factor and summary sections, separating the corpus by language (Portuguese and Spanish). Table 3, Panels A and B, reports the number of terms for the risk factor section, the summary section and the combination of both before and after removing the least repeated terms in the corpus for the Brazilian and other countries IPOs, respectively.

For Brazilian IPOs, the number of terms for each section in the corpus are 13,986 and 17,445, respectively. A high dispersion in the distribution of terms is observed in natural language processing. In order to focus the attention on the most important terms for the corpus we remove those that appear in only 10 percent of the data at most. In other words, we retain all terms whose document relative frequency idf is greater than a given threshold $N * (1 - sparsity)$, where N is the number of documents in the corpus. After removing the least repeated terms in the corpus we keep 2,594 terms in the risk factor section and 2,053 for the summary section.

For IPOs written in Spanish, the number of terms in the risk factor section is 10,237, fewer than in Portuguese. More remarkable is the fact that the number of terms in the summary is considerably less (7,726) than those found in Portuguese. This can be explained by the shorter Chilean prospectuses on average and the Brazilian prospectuses that are generally bigger than in any other country in Latin America.

[INSERT TABLE 3 HERE]

We use dictionaries as parameters to score each prospectus. The scoring mechanism $score_i^{tf.idf}$ of document i, is mainly the sum of $tf.idf$ weight of terms (queries) in document j over the total number of words in the document.

$$score_i^{tf.idf} = \frac{1}{(1 + \log a_i)} \sum_{j=1}^{J} w_{ij}^{tf.idf}$$

where:

$a = Total\ number\ of\ words\ in\ document\ i$

$w_{ij}^{tf.idf} = Weight\ of\ each\ term\ in\ document$

$J = Total\ number\ of\ words\ (uwn, positive)\ in\ the\ lexicon$

Table 4 reports sentiment word percentages for the summary and risk factor sections in the whole sample. The mean value for uncertainty and positive tone in the summary section is 2 and 4 percent, respectively. This value is slightly higher than the ones observed by Loughran & McDonald (2013) in the S-1 and 424 filings of US IPOs in which the percentage of uncertain words have a mean value of 1.3 percent. For the risk factor section, the mean value of uncertainty in tone is 6 percent, with a maximum of 11 percent. This increase in uncertainty is expected since this section of the prospectus declares the potential risks for investors. The inverse effect is observed in the positive tone used in the risk factor section, with a mean value of 2 percent.

[INSERT TABLE 4 HERE]

One aspect to consider is the homogeneity in tone at the moment of writing the IPO prospectus. The process begins with the decision of the firm to go public. Once decided by the firm, an underwriter is in charge of finally taking the firm public. In Latin America, the average number of underwriters participating in an IPO during the period 2000-2014 is four. In most cases, the combination of local and international underwriters is observed. The prospectus will finally be written by both the issuer and the underwriters.

Table 5 reports the Pearson correlation matrix of tone for both sections. As expected, the uncertain and positive words are not correlated in the summary; thus, the summary section has either an overall positive or uncertain tone. In addition, we also expected to find a positive correlation between tone uncertainty in the summary and risk factor sections $(0.21;\ \text{p value } \leq 0.01)$ and between positiveness in tone in these sections $(0.47;\ \text{p value } \leq 0.01)$. These correlations are as high as expected. Another interesting fact for these correlations is that tone uncertainty in the risk factor section leads to the use of positive words in both sections (positive and significant correlations but near 0.5). This could be interpreted as the goal of the prospectus writers to alleviate uncertainty in the risk factor section by using more positive words throughout the prospectus. Overall, we lack statistical significance in some correlations, along with statistically significant but low correlations in the tone measures between both sections. These results seem to indicate some heterogeneity of tone within the different sections of the prospectus.

The apparent heterogeneity in sections of the prospectus is now analyzed between prospectuses. We first construct a similarity measure to see how different, in general, tone content is between prospectuses. Due to lack of space we cannot describe here the whole process (analysis and tables available upon request), but we show under the assumption that the prospectus is written to convey particular information about the firm and the offer, the summary section, where the average similarity is just 0.35, seems to be more useful in terms of conveying valuable signals to the market, and it might differentiate between prospectuses.

Determinants of tone

In this section, we study the determinants of tone in the Latin American IPO prospectuses for the period 2000 - 2014. We run an OLS regression model with the following structure:

$$Y_i = \alpha + \beta_k' \mathbf{GV}_i + \delta_k' \mathbf{CV}_i + \varphi_k' \mathbf{CC}_i + \boldsymbol{\varepsilon_i}$$

where $\boldsymbol{Y_i}$ is the tone measure (Positive or Unfavorable); $\mathbf{GV}_i$ is the vector of governance-related variables: CEO duality (CEO Director), the number of directors (Board Size), and Board Independence. $\mathbf{CV}_i$ is the vector of control variables, which include financial and firm characteristics such as the number of underwriters involved in the IPO, the presence of the most experienced auditor in the region (Auditor), family ownership (Family Owner), age of the firm (Firm Age), EBITDA (earnings before interest, taxes, depreciation and amortization), number of risk factors reported in the prospectus (Risk factors), and the use of proceeds of the IPO (Use of proceeds); A vector of context controls, $\mathbf{CC}_i$ pertains to market capitalization at the country level, the 2007 financial crisis (dummy), and Brazilian IPOs (dummy).

In Table 7 we present the descriptive statistics of our sample. We aim to measure how a powerful CEO could affect the tone sent to the market through the prospectus and how the firm-level governance structure counterbalances such actions. The power of the CEO is measured by a dummy variable that takes the value of 1 if the CEO is also the chairman of the board, and 0 otherwise. As explained in the hypotheses development section, CEO duality serves as a proxy for CEO power (Finkelstein, 1992). In our sample, 70 percent of the CEOs were also chairman of the board.

As argued before, a well-functioning board should be more conservative when sending information to the market through the IPO prospectus. In this regard, we have two measures of board effectiveness: Board Size and Board Independence. In our sample, the mean board size is around 7 directors. In terms of board independence, close to one-third of board directors were classified as independent in the prospectus, although the variation is high for this variable, which runs from a minimum of 8 percent to 89 percent in the extreme case. The description id the other control variables are available upon request due to lack of space.

[INSERT TABLE 7 HERE – available upon request due to lack of space]

We now study the determinants of positive and unfavorable tone in the IPO prospectus. As shown in Table 8, CEO Director is our proxy for a powerful CEO and has a positive and statistically significant relation to the use of positive words in the IPO prospectus. On average, CEO directors lead to 0.53 percent more positive words in the prospectus, which represents 12.4 percent of the mean of positive words used in our sample. As expected, powerful, entrenched CEOs tend to use an overly optimistic tone in IPO prospectuses because an unsuccessful IPO will increase the probability of their dismissal and loss of their private benefits of control. The results are consistent across all model specifications.

Does firm-level governance affect the tone of the IPO prospectus? In Table 8 we show that board size has a negative and significant impact in the positiveness of tone in our sample. This result is consistent across all model specifications. Interestingly, the relation between board size and tone is non-monotonic, as shown in the positive and significant coefficient of the board size square coefficient. As argued above, it seems that there is an optimal board size in term of its effect on the positive tone of the IPO prospectus. That is, bigger boards whose directors care about their reputation in the listed firm market could have more capacity to supervise the CEO and counterbalance the CEO tendency to use excessive positive words; however, our findings suggest that this bigger board's supervisory capacity could be outweighed by potential coordination and free riding problems. Further analysis, shows that for our sample the optimal board size is around 11 (using coefficients of Table 8, Column 1) and 13 board members (using coefficients of Table 8, Columns 3 and 4).

We also want to analyze board independence. As reported in Table 8, the level of board independence measured as the fraction of independent directors has no statistical impact on the positiveness of the prospectus summary.

[INSERT TABLE 8 HERE]

The number of uses proposed for proceeds has a positive and significant impact in all model specifications. In the summary section the benefits of the IPO is positively stressed in terms of the different uses the firm expects for the money raised in the IPO. In addition, the number of risk factors is attenuated by the use of positive words. The age of the firm is positively related to the positive tone of the IPO, where management probably highlights the firm's background. And finally, the crisis dummy (IPO after 2007) has a positive and significant impact on the positiveness of the IPO prospectus in our sample. This is consistent with the idea of strongly stressing the advantage of firms that decided to submit their IPO after the 2007 crisis.

We now analyzed the impact of a powerful CEO and board structure on an unfavorable tone in the IPO. As expected, every CEO will want to reduce the use of unfavorable tone in the IPO process as much as possible, but as argued above, powerful and entrenched CEOs will be unwilling to put forward any unfavorable words. As shown in Table 8, the relation between CEO Director and unfavorable tone is consistently negative and statistically significant. On average, CEO directors are associated with 0.32 percent fewer uncertainty words in the prospectus, which represents 13.6 percent of the mean of uncertainty words used in our sample.

Regarding board size, the relationship is consistently positive and significant across all the models. As expected, the reputational effect of the board will encourage directors to put their firms in a more balanced position, avoiding an overly optimistic view of the firm through the tone of the prospectus. We also find a non-monotonic relationship, given the consistent and negative board size square coefficient. As mentioned above in the hypothesis development section, small boards could lack expertise and diversity, while large boards could suffer coordination and free riding problems. Hence, boards that are too small or too large could fail in advising and supervising management in the disclosure process and the writing of the IPO prospectus. Further analysis shows that for our sample the optimal board size is around 13 directors (using coefficients of all columns in Table 9).

Board independence has a very robust and positive effect on the use of an unfavorable tone in the IPO prospectus. This result could be regarded as the independent directors' influence in curbing misleading information by the CEO and offering the market a more realistic assessment of the IPO.

[INSERT TABLE 9 HERE]

Regarding the control variables, the presence of a reputable auditor had a significant negative impact on unfavorable tone. We can view this result as the top management's using a less unfavorable tone, maybe counterbalancing any unfavorable disclosure already put in place in the auditor report. Another possible interpretation is that a reputable auditor is hired by firms with less uncertainty and better future prospects. Also, we found less unfavorable tone with mention in the IPO prospectus of more uses for proceeds. Again, and consistent with previous results, a clear firm strategy for using the proceeds of the IPO will lead to the use of more positive and fewer negative words.

Conclusion

Overall, the results show that well-functioning boards counterbalance powerful CEOs in the preparation of an IPO prospectus in a more accurate and conservative way. Our econometric results also show that market-dominant auditors, age of the issuing firm, proposed use of proceeds, and the number of risk factors in the prospectus significantly affect the tone in the information disclosed in the IPO prospectuses of Latin America.

This paper studies the prospectus issued during an IPO and its role in reducing information asymmetry between buyers and sellers of new assets. We focus in the qualitative information disclosed by the prospectus, specifically in the sections labeled "risk factors" and "summary". Using a statistical approach to natural language processing, we find empirical evidence of dissimilarity between the two sections. This dissimilarity can be found in the tone used to describe the nature of the section or a regulation. When the analysis is extended between prospectuses, we find a high similarity for the "risk factor" section. This fact represents a disadvantage for investors using the prospectus to collect information about the IPO. This result suggests that the section that conveys differentiated information and that could serve as a signal mechanism is the summary section.

In consequence, we studied the determinants of tone in the summary section. We show that well-functioning boards counterbalance the influence of powerful CEOs in preparing the IPO prospectus in a more accurate and conservative way. Our econometric results also show that market-dominant auditors, age of the issuing firm, proposed use of proceeds, and the number of risk factors reported in the prospectus significantly affect the tone of information disclosed in the prospectus accompanying an IPO in Latin America.

References

Full list of reference available upon request due to lack of space.

Table 1.

IPO Sample Description.

Panel A - Sample prospectuses

Source/Filter	Observations Removed	Sample Size
Total IPOs according to countries' stock exchanges and Bloomberg database for the period 1990-2014		396
Minus IPOs during the period 1990-1999	62	334
Minus withdrawn IPOs	77	257
Minus pending IPOs	13	244
Minus postponed IPOs	2	242
Minus not found prospectuses	49	193

Panel B - Sample prospectuses by country

Country	Prospectuses
Brazil	138
Mexico	29
Chile	16
Colombia	8
Peru	2

Panel C - Sample prospectuses by year

Year	Prospectuses
2000	1
2004	9
2005	13
2006	25
2007	66
2008	8
2009	9
2010	17
2011	13
2012	13
2013	16
2014	3

Table 3.

Panel A and B report the number of terms for the risk factor section, the summary section and the combination of both before and after removing the least repeated terms in the corpus for Brazilian and other countries IPOs, respectively.

Panel A. Number of terms in Brazilian IPOs

Variable	Risk factor	Summary	Both
Number of terms	13986	17445	22709
number of terms (after sparsity)	2594	2053	3725

Panel B. Number of terms in other countries IPOs

Variable	Risk factor	Summary	Both
Number of terms	10237	7726	7722
number of terms (after sparsity)	2605	1325	1325

Table 4.

Tone measure summary statistics for IPO sample, 2000 – 2014. The Lougran and McDonald (2011) word lists are used to classify words into uncertain and positive. Statistics are reported for summary and risk factor section

Statistics	Obs.	Mean	St. Dev.	Min	Max
Uncertainty in summary	170	2.35	0.95	0.61	5.97
Positive in summary	170	4.28	1.36	0.99	9.05
Uncertainty in risk factor	181	6.03	1.66	3.23	11.46
Positive in risk factor	181	2.17	1.11	0.53	7.75

Table 5.

The table reports Pearson correlation coefficients for tone measures in summary and risk factor section for IPO sample, 2000 – 2014. Significance levels are reported at 1% (***), 5% (**) and 10%(*)

Statistics	Uncertain_sum	Positive_sum	Uncertain_rf
Uncertain_sum	1		
Positive_sum	-0.11	1	
Uncertain_rf	0.21***	0.35***	1
Positive_rf	0.04	0.47***	0.55***

Table 8.

This table reports the impact of governance and control variables in the positive tone of the IPO prospectus of the sample, 2000 – 2014.

VARIABLES	(1) Positive Tone	(2) Positive Tone	(3) Positive Tone	(4) Positive Tone
CEO Director	0.492**	0.566***	0.500**	0.566***
	(0.203)	(0.211)	(0.203)	(0.190)
Board Size	-0.366**	-0.450***	-0.400***	-0.474***
	(0.143)	(0.141)	(0.127)	(0.121)
Board Size^2	0.019***	0.022***	0.019***	0.022***
	(0.006)	(0.006)	(0.005)	(0.005)
Board Independence	0.636	0.835	-0.431	-0.178
	(0.749)	(0.705)	(0.734)	(0.696)
Number of Underwriters	0.136	-0.047	0.077	-0.086
	(0.194)	(0.180)	(0.202)	(0.197)
Auditor	0.182	0.320	0.267	0.386**
	(0.208)	(0.200)	(0.182)	(0.178)
Family Owner	0.170	0.196	0.130	0.156
	(0.237)	(0.223)	(0.220)	(0.211)
Firm Age	0.206**	0.169**	0.147**	0.118*
	(0.087)	(0.085)	(0.070)	(0.071)
EBITDA	-0.000	-0.000	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Risk factors	0.701**	0.948***	0.401	0.645**
	(0.342)	(0.343)	(0.285)	(0.293)
Use of proceeds	0.460***	0.409**	0.442***	0.397**
	(0.163)	(0.174)	(0.153)	(0.156)
Market Capitalization	-0.013***	-0.002	-0.002	0.007
	(0.005)	(0.005)	(0.004)	(0.005)
Crisis dummy		1.117***		1.012***
		(0.305)		(0.295)
Brazil dummy			-1.907***	-1.777***
			(0.536)	(0.483)
Constant	2.767**	1.232	5.404***	3.834**
	(1.393)	(1.483)	(1.415)	(1.469)
Observations	122	122	122	122
R-squared	0.313	0.383	0.407	0.464

Robust standard errors in parentheses

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

Table 9.

This table reports the impact of governance and control variables in the unfavorable tone of the IPO prospectus of the sample, 2000 – 2014.

VARIABLES	(1) Unfavorable Tone	(2) Unfavorable Tone	(3) Unfavorable Tone	(4) Unfavorable Tone
CEO Director	-0.319*	-0.322*	-0.319*	-0.322*
	(0.187)	(0.187)	(0.188)	(0.188)
Board Size	0.267***	0.270***	0.267***	0.270***
	(0.082)	(0.086)	(0.082)	(0.086)
Board Size^2	-0.011***	-0.011***	-0.011***	-0.011***
	(0.004)	(0.004)	(0.004)	(0.004)
Board Independence	1.705***	1.698***	1.702***	1.691***
	(0.436)	(0.436)	(0.436)	(0.434)
Number of Underwriters	-0.028	-0.021	-0.029	-0.022
	(0.121)	(0.121)	(0.120)	(0.120)
Auditor	-0.383**	-0.388**	-0.383**	-0.388**
	(0.149)	(0.155)	(0.155)	(0.160)
Family Owner	0.191	0.190	0.191	0.190
	(0.141)	(0.141)	(0.143)	(0.143)
Firm Age	-0.052	-0.051	-0.052	-0.051
	(0.071)	(0.074)	(0.075)	(0.077)
EBITDA	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Risk factors	-0.357	-0.367	-0.358	-0.368
	(0.433)	(0.427)	(0.454)	(0.448)
Use of proceeds	-0.441***	-0.439***	-0.441***	-0.439***
	(0.134)	(0.132)	(0.134)	(0.132)
Market Capitalization	-0.000	-0.001	-0.000	-0.001
	(0.004)	(0.004)	(0.005)	(0.005)
Crisis dummy		-0.042		-0.043
		(0.227)		(0.228)
Brazil dummy			-0.005	-0.011
			(0.348)	(0.349)
Constant	2.372	2.430*	2.379	2.446
	(1.438)	(1.391)	(1.607)	(1.565)
Observations	122	122	122	122
R-squared	0.312	0.312	0.312	0.312

Robust standard errors in parentheses

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