

ESG and the Pricing of IPOs:

Does Sustainability Matter

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Abstract:

The IPO process involves a large amount of information delivered to the public through different means. Information frictions may be what causes most of the underpricing. Socially conscious investors supposedly use the ESG criteria to check for potential investments. Thus, we argue that disclosing more ESG information in the S-1 prospectus diminishes the information asymmetry between the company and the investors, positively benefiting the companies' financial performance, here in terms of lower underpricing and evaluation. Based on a sample of 783 U.S. IPOs we compute a text-based measure of ESG disclosure in IPOs. Our results show that (a) the amount of ESG disclosures in the S-1s is negatively associated with IPO's underpricing and Tobin's Q; (b) this effect is primarily driven for the underpricing by the ESG as a whole, as well as for the price revision. Our analyses show instead that when considering Tobin's Q investors value at most the governance part of sustainability.

Keywords: sustainability; ESG; IPOs; underpricing; price revision; Tobin's Q; disclosure; financial communication

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1. Introduction

In the last few years, investors and the financial community have devoted increasing attention to the role of sustainability in financial markets and the economy at large (Friede et al. 2015; Hartzmark and Sussman 2019). Either because sustainability is seen as an alternative form of risk management (Lenssen et al. 2014), because markets and clients are expecting financial institutions and corporations to do so (Sheth et al. 2011), or also because of a genuine interest in creating and preserving value for the future generations (Lagoarde-Segot and Paraque 2018). Every participant in the financial industry is now attempting to create meaningful and valuable relationships with sustainability and the sustainability effects of their businesses. Furthermore, research proved that investors consider sustainability and ESG rating in their investment decision (Friede et al. 2015; Pedersen et al. 2020). Socially conscious investors supposedly use the ESG criteria to check for potential investments, either because of the intrinsic value they attribute to sustainability or because they might want to avoid investing in companies that do not monitor their environmental, social, and governance practices sufficiently.

The ESG topics are three factors that measure the social impact and sustainability of a company. E stands for “Environmental”, it covers themes like company’s waste, pollution, energy use, compliance with environmental regulations, treatment of animals, natural resource conservation, and everything related to climate change and sustainability in general. S is for “Social”, and it considers labour issues like how the company manages consumer protection, data security, human rights, working conditions, relationships with suppliers, employees, customers, communities in which it operates, and everything related to diversity in the workforce. G stands for “Governance”, it deals with shareholder rights, executive pay, audits, internal controls, and the company’s leadership. It is also a mechanism to cope with agency problems between the company’s owners (shareholders) and managers.

Therefore, accounting and investors relations professionals include ESG reporting and communication strategies into their analyses to effectively cater to the investors with the information they eager to correctly evaluate possible investment opportunities (Brandon et al. 2021; Crifo et al. 2019). At the same time, communication is a critical success factor in Initial Public Offerings. Communicating correctly with investors,

regulators, and the general public is pivotal for the company to succeed in the process (Bajo and Raimondo 2017; Bradley and Jordan 2002; Hanley and Hoberg 2010; Loughran and McDonald 2013).

Therefore, we claim a significant relationship exists between ESG communication and IPOs pricing and evaluation. Following Ljungqvist (2007), we consider the empirical evidence suggesting that the asymmetric information models have a first-order effect on underpricing. Our model traces the amount of information about sustainability that the companies about to go public disclosed to investors, focusing specifically on the mandatory communication occurring before the IPO date. More specifically, we focus on the amount of ESG disclosure in the S-1 prospectuses, since these documents are read mostly by institutional investors, of which investment decisions are the most influential. Furthermore, these documents also serve as a primary source for specialized newspapers, contributing to the grasping and diffusion of the information about future public companies (Bajo and Raimondo 2017).

In order to do so, we analyze the ESG disclosure in the S-1 and F³ prospectuses of 783 U.S. IPOs in 2012-2019. We find that an increase in the ESG disclosure, both in its singular components and together, is negatively associated with the level of observed underpricing, suggesting that first-day returns decrease in response to more ESG disclosure. The effect's economic magnitude is important as one standard deviation in the Environmental, Social, Governance, and ESG variables lead respectively to a decrease in the IPO's underpricing of 0.073, 0.141, 0.148, and 0.156 standard deviations, and in the Tobin's Q of 0.058, 0.116, 0.217, and 0.174 standard deviations.

This research contributes to the increasing stream of literature that looks at the relationship between ESG and finance and, more specifically, at the economic effects of the quantity of ESG disclosure. This paper might be the first to shed light on the importance of IPOs' ESG disclosure in producing sizeable economic effects.

This paper organizes as follow: Section 2 contains the possible testable hypothesis, and what led to them; Section 3 illustrates the data and the methodology employed, as well

³ Same to the S-1 form, but only used by non-U.S. companies. From now on, the registration statement, independently if an S-1 or F-1, will be called S-1 for ease of use.

as the descriptive statistics; Section 4 presents the empirical results; Section 5 shows the robustness checks taken; Section 6 concludes and opens a discussion.

2. Research hypothesis

Our first research hypothesis states a negative correlation between the amount of ESG disclosure in the S-1, both considered singularly or together, and the underpricing. We claim this is consistent with a view in which we have a reduction of information asymmetries: disclosing new information diminishes the information asymmetry between the firm and the external investors. Furthermore according to a extensive literature review (Friede, Bush and Bassen 2015), ESG disclosure by itself is able to bring positive benefits to the companies' financial performance. Thus, the correlation with underpricing should be negative, since it the reduction of the information asymmetries is associated with a more precise offer price estimation would lead to lower first-day returns. Furthermore, following Friede, Bush and Bassen (2015), our second hypothesis states that the most negative relationship with underpricing, in order of magnitude, should be found with the Governance disclosure, second the Environmental, third the Social, and last with the ESG disclosure as a whole. Similarly, the same approach applies to the effect of ESG disclosure on the price revision. Our third research hypothesis states a negative correlation between the amount of ESG disclosure in the S-1 and the firm evaluation. That is because disclosing information diminishes the information asymmetry. Thus, the company's evaluation should be more precise. Following again Friede, Bush and Bassen (2015), our fourth hypothesis states that the most negative relationship with firm evaluation, in order of magnitude, should be found with the Governance disclosure, second the Environmental, third the Social, and last with the ESG disclosure as a whole.

3. Methodology and data

3.1 Textual and econometrics analysis

We perform textual analysis for the S-1 forms as in Loughran and McDonald (2011). We search the financial document for a list of words that are likely associated with some sentiment attributes, like positiveness, negativeness, and uncertainty, to get the related variables. We perform such an analysis in R, through the use of the package "edgar",

which already has the Loughran-McDonald sentiment dictionaries in it and that automatically downloads all the S-1s and parse them for the words, without counting the terms which are not meaningful, like encoding parts that are not actual words, such as HTML tags and exhibits text.

We also use textual analysis to get this paper's three variables related to Environmental, Social, and Governance using the same R package. Our reason is to understand how much these topics are disclosed in the S-1s. Developing a dictionary of words related to the ESG topics is fundamental to get the related variables. Therefore, we developed three word lists for each of the ESG factors following a similar approach to that already used in the literature (Baier et al. 2020). In this way, we obtain lists formed by 515 terms (118 for the Environmental, 223 for the Social, and 174 for the Governance). The lists are fully included in *Appendix B* at the end of the paper.

In the *Appendix A*, we report three examples of S-1 chapters with a relevant disclosure of ESG topics. Here is a small preview from Nexa Resources S.A., ADT Inc., and Sabre Corp. with green, blue, and yellow, for the Environmental-related, Social-related, and Governance-related words in order.

We have already implemented several initiatives, such as **agricultural** limestone production and sale in our Morro Agudo **mine** and a lead-silver project in Vazante **mine**, where we introduced a new flotation cell to recover lead-silver. This will result in a decrease in the consumption of **natural resources** and costs as well as the lower level of **environmental** impacts associated with the disposal of such **waste**.

Our business depends on our **reputation** and ability to maintain good **relationships** with our subscribers, dealers and local **regulators**, among others. Our **reputation** may be harmed either through **product defects**, such as the failure of one or more of our subscribers' alarm systems, or shortfalls in **customer** service.

[R]eviews the **audit** plans and findings of our independent registered public accounting firm and our internal **audit** and risk review staff, as well as the results of **regulatory** examinations, and **tracks management's** corrective action plans where necessary; -reviews our financial statements, including any significant financial items and/or changes in accounting **policies**, with our senior **management** and independent registered public accounting firm.

We then performed the econometrics analysis, retrieving the descriptive statistics (for instance, mean, median, standard deviation, min, max, and percentiles), the correlations between the variables, and the ordinary least-squares linear regressions.

3.2 Data sample

The sample contains 783 observations starting from the beginning of 2012 to the end of June 2019. We design the time frame choice to include the increasing attention devoted to the ESG topic, which is relatively new, together with the need to have at least one full year between the IPO and the research (to get all the necessary data). The research focuses on how institutional and retail investors are affected by more or fewer ESG disclosures. So are chosen only companies having done the IPO in the Nasdaq or NYSE because they are the only U.S. stock exchanges operating in the secondary market, thus being open to the public. We use Eikon, Bloomberg, and WRDS databases to get the data, check for discrepancies, and get different data that were not present in only one of the three. We follow the other research (An and Chan 2008; Loughran and McDonald 2013) and not consider some firms for the dataset. Such as financial firms (for instance, banks and savings and loans, mutual funds and investment companies) with SIC codes between 6000 and 6999, American Depository Receipts (ADRs), American Depository Shares (ADSs), Real Estate Investment Trusts (REITs), Closed-end funds, Reverse LBOs (Leveraged Buyouts), Unit issues, and offerings with a price below \$5.00 per share. The amount of money issued and the number of shares offered is different if downloaded as “Simple” or “Advanced” Bloomberg Excel files. We choose the “Advanced” one as more truthful by looking at the proportion of shares offered in the IPO to the total. It is possible to see that the “Advanced” version is the one with fewer errors since no companies are resulting to have issued more shares than the actual total, unlike in the “Simple” version. We then check by hand on the Bloomberg Terminal and correct the few companies that still had the number of shares error.⁴⁵ Through R, the “CIKgetter.R” package makes it possible to get the CIK values for all the companies, but we search by hand on the SEC EDGAR website a few that are missing. The CIKs are functional to use the package “edgar” making it possible to get to the last fundamental text variables related to the IPO’s S-1 prospectus.

⁴ Atossa Genetics and Jones Energy Pure are deleted from the database since it is impossible to find reliable information about their total number of shares and the number offered at the IPO. Omthera Pharmaceuticals, Arcturus Therapeutics, Plains GP Holdings, La Quinta Holdings, Enlivex Therapeutics, 8Point3 Energy Partners, AC Immune, and Wah Fu Education Group are also deleted since it is impossible to find either their total assets, market value, and total common equity for the IPO’s quarter-end. We also delete ShiftPixy from the database after collecting the S-1’s text analysis related variables since it is impossible to find its prospect.

⁵ From the Warrington website, it is possible to get the dates of the foundation of the companies.

3.3 Data summary statistics

Our ending database contains 783 observations starting from the beginning of 2012 to the end of June 2019.

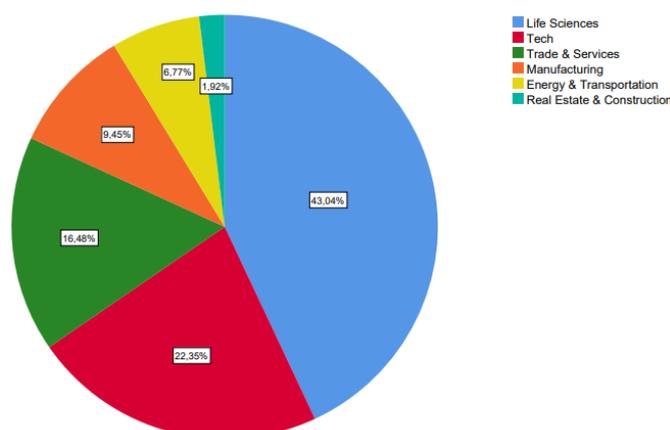


Figure 1. This pie chart shows the percentage of IPOs between 2012-(end of June)2019 that are part of a specific industry, based on the SEC's division of sectors.

In terms of industry, 15 (1.92%) companies are from the Real Estate & Construction sector, 53 (6.77%) are from the Energy & Transportation sector, 74 (9.45%) are from the Manufacturing sector, 129 (16.48%) are from the Trade & Services sector, 175 (22.35%) are from the Technology sector, and the last 337 (43.04%) are from the Life Sciences sector.

For the stock exchanges, 272 (34.74%) companies' shares traded on the NYSE, while the last 511 (65.26%) on the Nasdaq.

Table 1. IPO summary statistics. The table reports the summary statistics for the sample of 783 U.S. IPOs in the period 2012-(end of June)2019. Panel A provides the statistics for the IPO variables: First-day returns is the difference between the first-day closing price and the offer price, divided by the offer price, Industry-adjusted Tobin's Q is the natural logarithmic version of the firm's Tobin's Q divided by the median Tobin's Q in the firm's industry, Tobin's Q is the IPO's quarter-end total assets plus the market value minus the common equity, divided by the total assets, Price revision is the ratio between the offer price and the filing price range (minus 1), Shares overhanging is the number of shares retained divided by the number of shares in the initial public offering, Days between announcement and trading is the number of calendar days between the first S-1 filing and the IPO date, Firm age is the firm age at the IPO date, Proceeds is the total amount of IPO proceeds, Leverage (D/A) is the ratio of pre-IPO's quarter-end total debt to total assets, Leverage (D/E) is the ratio of pre-IPO's quarter-end total debt to total stockholders' equity, Lockup dummy equals to 1 if there is a lockup period (otherwise 0), Exchange dummy equals to 1 if the shares got listed on the Nasdaq exchange (0 if on the NYSE exchange), Primary dummy equals to 1 if the offering is 100% made of primary shares (otherwise 0), Tech dummy is a dummy assuming a value equal to 1 if the firm operates in the Technology sector, as defined by the SEC (otherwise 0). Panel B reports the variables related to the mandatory disclosure by the firm (S-1 forms): Number of Environmental words, Number of Social words, Number of Governance words are the number of words within the S-1 that are classified respectively as E, S, G using our list, Number of ESG words is the cumulative number of words within the S-1 that are classified as being E, S, or G using our list, Environmental words, Social words, Governance words are the percentage of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the cumulative percentage of words within the S-1 that are classified as being E, S, or G using our list, Negative words,

Positive words, Uncertainty words, are the percentage of words within the S-1 that are classified as their tones using the Loughran and McDonald (2011) word list.

Variable	Obs	Mean	Median	St. Dev.	Min	Max	5 th percentile	10 th percentile	90 th percentile	95 th percentile
Panel A: IPO characteristics										
First-day returns	783	0.1968	0.1105	0.3102	-0.4108	2.0667	-0.1445	-0.0740	0.6134	0.8416
Industry-adjusted Tobin's Q	783	0.3772	0.3473	0.2471	-0.0884	3.2998	0.0687	0.1234	0.6524	0.8024
Tobin's Q	783	4.7370	3.2408	7.9825	0.8028	151.4289	1.2071	1.4073	8.3262	11.4723
Price revision	783	-0.0217	0.0000	0.1418	-0.6154	0.4167	-0.2857	-0.2348	0.1333	0.1667
Shares overhanging	783	3.7893	3.1025	5.4405	0.0000	123.5433	0.9561	1.4219	6.2727	7.7914
Days between announcement and trading	783	69.8352	30.0000	111.1193	1.0000	1267.0000	19.0000	19.0000	170.4000	258.2000
Firm age	783	20.9604	13.0000	24.2669	0.0000	166.0000	3.0000	4.0000	45.6000	75.0000
Proceeds (USD million)	783	247.2958	116.8000	662.0271	3.4860	16006.8770	27.3600	46.0000	511.4708	801.4652
Leverage (D/A)	783	1.0431	0.7190	2.3083	0.0233	39.0513	0.0961	0.1676	1.4917	2.5141
Lockup dummy	783	0.9936	1.0000	0.0797	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Exchange dummy	783	0.6526	1.0000	0.4764	0.0000	1.0000	0.0000	0.0000	1.0000	1.0000
Primary dummy	783	0.2146	0.0000	0.4108	0.0000	1.0000	0.0000	0.0000	1.0000	1.0000
Tech dummy	783	0.2235	0.0000	0.4169	0.0000	1.0000	0.0000	0.0000	1.0000	1.0000
Panel B: ESG and Tone										
Number of Environmental words	783	305.3218	216.0000	292.2954	38.0000	3328.0000	99.2000	113.4000	556.8000	880.8000
Number of Social words	783	1231.7739	1204.0000	347.8856	365.0000	3806.0000	776.8000	842.4000	1645.4000	1813.0000
Number of Governance words	783	1829.3614	1773.0000	420.8188	629.0000	4604.0000	1271.4000	1376.0000	2316.6000	2571.8000
Number of ESG words	783	3366.4572	3253.0000	850.0637	1051.0000	8876.0000	2272.8000	2482.4000	4315.0000	4817.8000
Environmental words (% point)	783	0.0035	0.0025	0.0029	0.0008	0.0293	0.0013	0.0015	0.0065	0.0092
Social words (% point)	783	0.0145	0.0145	0.0025	0.0046	0.0273	0.0106	0.0114	0.0172	0.0182
Governance words (% point)	783	0.0216	0.0215	0.0024	0.0086	0.0307	0.0177	0.0188	0.0244	0.0259
ESG words (% point)	783	0.0395	0.0392	0.0047	0.0153	0.0717	0.0331	0.0344	0.0451	0.0473
Negative words (% point)	783	0.0202	0.0202	0.0034	0.0060	0.0304	0.0147	0.0157	0.0246	0.0257
Positive words (% point)	783	0.0098	0.0097	0.0016	0.0047	0.0209	0.0075	0.0080	0.0117	0.0125
Uncertainty words (% point)	783	0.0181	0.0180	0.0022	0.0060	0.0248	0.0148	0.0153	0.0209	0.0218

Table 1, Panel A presents the descriptive statistics at the IPO level. This panel reports the statistics for the dependent and control variables, while panel B reports those for sentiment and ESG topics, both at the S-1 level. First-day returns is the percentage difference between the first day of trade closing price and the offer price, and it denotes an average (median) of 19.68 (11.05) percent. Industry-adjusted Tobin's Q neutralizes the effects of specific industries on the Tobin's Q⁶ and is the natural logarithmic version of the firm's Tobin's Q divided by the median Tobin's Q in the firm's industry⁷, it then denotes an average (median) of ~0.38 (~0.35). Tobin's Q is a measure of firm value calculated as the IPO's quarter-end total assets plus the market value minus the common equity, divided by the total assets⁸, and it shows an average (median) of ~4.74 (~3.24). Price revision is the ratio between the final offer price and the middle of the book-building price range (minus one), and it shows that the offer price has been on average set -2.17% above the mid-price (~0% in median). Shares overhanging denotes that the overhang is on average (median) of ~3.79 (~3.10). Days between announcement and trading denotes that the firms take on average (median) ~70 (30) days to go public from publishing the first S-1 form. Firm age shows that the average firm's age (Age at IPO) when it goes public is ~21 years (13 years in median). Proceeds proxies for the IPO size and shows that the average (median) firm collects nearly ~\$247 (~\$117) million

⁶ It is a measure of firm value explained next.

⁷ It is used and calculated following the reasoning of Jo and Harjoto (2011).

⁸ Following the formula provided by WWU Münster. "WRDS: Data Items". Accessed April 26, 2021. https://www.wiwi.uni-muenster.de/uf/sites/uf/files/2017_10_12_wrds_data_items.pdf.

through the offer, while the highest-grossing IPO (Facebook Inc.) has collected nearly ~\$16.01 billion. Leverage (D/A) is a representation of how much the firm can finance itself, and is the ratio of pre-IPO's quarter-end total debt to total assets, showing average (median) of ~1.04 (~0.72). The remaining variables indicate that on average roughly 99% of IPOs are accompanied by a lockup agreement, that 65% of shares get floated on the Nasdaq exchange, and that 22% of the firms sell only (100%) primary shares during the IPO.

Panel B lists the variables obtained from sentiment and textual analysis regarding the S-1 forms. Number of Environmental words is the number of words related to the E topic in the S-1 form, and it shows that the average is ~305 (216 in median). Number of Social words is the number of words related to the S topic in the S-1 form, and it denotes that the average is ~1232 (1204 in median). Number of Governance words is the number of words related to the G topic in the S-1 form, and it shows that the average is ~3367 (3253 in median). The latter variable Number of ESG words is cumulative of the precedent three. Environmental words is the percentage number of words related to the E topic in the S-1 form, and it denotes that the average is around 0.35 (0.25 in median). Social words is the percentage number of words related to the S topic in the S-1 form, and it shows that the average is around 1.45 (1.45 in median). Governance words is the percentage number of words related to the G topic in the S-1 form, and it shows that the average is around 2.16 (2.15 in median). ESG words is the cumulative percentage of the precedent three. Negative words shows that the average (median) of negative tone words in the S-1 form is 2.02 (2.02) percent. The remaining sentiment variables Positive words and Uncertainty words show that the mean and median percentage values are quite similar too, differencing only around a ± 0.01 percentage point.

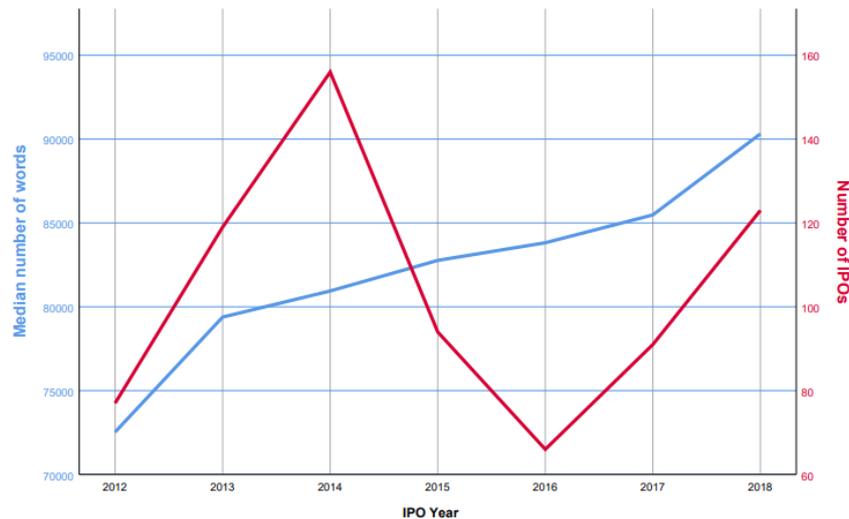


Figure 2. This graph plots the median number of words in the S-1 filings and the number of IPOs for the sample of 726 U.S. IPOs in the period 2012-2018. The full dataset is actually of 783 U.S. IPOs for the period 2012-(end of June)2019, but missing half of the last year meant it could not be shown not to induce visual misrepresentation of the data.

Figure 2 reports the median number of words in the S-1 filings and the number of IPOs by calendar year. The median number of words significantly increased during the sample period. The typical 2012 IPO contained less than 75000 words in the S-1 form, while the document for the typical 2018 IPO had about 90000 words. Loughran and McDonald showed that during 2010 (the last year of their sample) the median number of words for an S-1 form was at its highest levels of around 80000 words (311, 2013). Between their research and this paper, a one-year gap occurs, and then the 80000 words record gets broken in 2014. Possibly both 2011 and 2012, or only the latter, have been outliers of a trend that sees the S-1 forms become more prolonged, and possibly more detailed. In 2014 there was the highest number of IPOs for one calendar year, at almost 160. This level does not appear from around 2010 following the Loughran and McDonald research (maybe the missing calendar year 2011 could have also had a big number of IPOs but, following the trend, it seems implausible since in 2010 and 2012 the number was always around 80 IPOs). It is also interesting to note that something must have happened around the next two years 2015-2016 since the number of IPOs dropped in that time-frame.

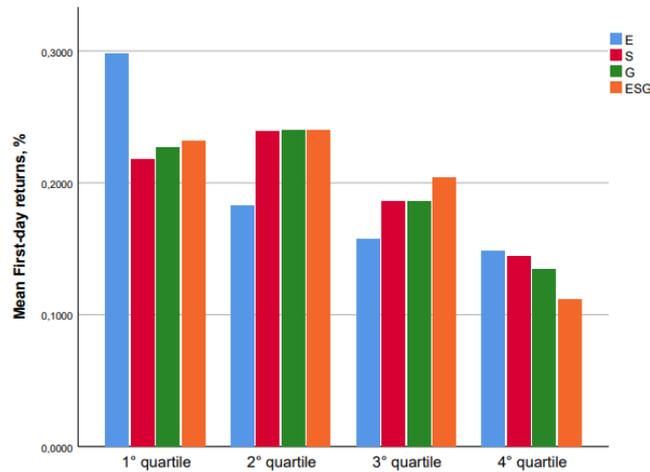


Figure 3. This chart plots the mean IPO's First-day returns sorted, in each case, by Environmental, Social, Governance, and ESG word quartiles during 2012-(end of June)2019. First-day returns is defined as the difference between the first-day closing price and the offer price, divided by the offer price, Environmental, Social, and Governance are the number of words within the S-1 that are classified respectively E, S, G using our list, ESG is the cumulative number of words within the S-1 that are classified as being E, S, or G using our list.

Figure 3 reports a fall in underpricing from the smallest to the largest quartile. For example, IPOs in the 1° Environmental quartile have average first-day returns of 29.82% compared to 14.87% for the 4° Environmental quartile, a difference of 14.95%, between the extreme quartiles. For example, the first three companies of the 1° quartile, Atomera Inc., Energous Corp., LendingClub Corp., have the lowest number of Environmental words in the S-1 of 38, 46, 50, and the underpricing of 7.73%, 76.33%, and 56.20% respectively. While the last three companies of the 4° quartile, Warrior Met Coal LLC, Ramaco Resources Inc., Nexa Resources S.A., have the highest number of Environmental words in the S-1 of 2134, 2462, 3328, and the underpricing of -5.26%, 0.37%, and 8.75% respectively. The difference between the other extreme quartiles of Social, Governance, and ESG are respectively of 7.32%, 9.25%, and 11.99%. The only lack of lowering underpricing is between the 1° and 2° quartiles of Social, Governance, and ESG. There the first-day returns increase a bit, respectively of 2.15%, 1.35%, and 0.86%. These results may signify that for Social, Governance, and ESG the number of words in the S-1 must increase significantly to see a positive effect on underpricing. Still, sorting IPOs by either Environmental, Social, Governance, or ESG word frequencies produces large first-day return differences between the quartiles. A large increase in the number of Environmental, Social, Governance, and ESG words (as the cumulative number of E, S, G) in the S-1 form leads to reduced information asymmetry, a decrease in underpricing, and a positive effect for the company. Furthermore, it will

be essential to check if such a negative correlation between these variables and the underpricing is significant to confirm the first hypothesis.

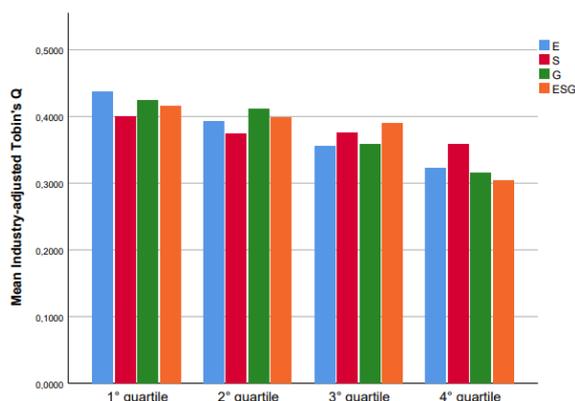


Figura 4. This chart plots the mean IPO's quarter-end Industry-adjusted Tobin's Q sorted, in each case, by Environmental, Social, Governance, and ESG word quartiles during 2012-(end of June)2019. Industry-adjusted Tobin's Q is defined as the natural logarithmic version of the firm's Tobin's Q divided by the median Tobin's Q in the firm's industry, Environmental, Social, and Governance are the number of words within the S-1 that are classified respectively E, S, G using our list, ESG is the cumulative number of words within the S-1 that are classified as being E, S, or G using our list.

Figure 4 reports a decrease, thus a more precise, firm evaluation from the smallest to the largest quartile. For example, IPOs in the 1^o Environmental quartile have average Industry-adjusted Tobin's Q of 0.4370 compared to 0.3226 for the 4^o Environmental quartile, a difference of 0.1144 points, between the extreme quartiles. For example, the first three companies of the 1^o quartile, Atomera Inc., Energen Corp., LendingClub Corp., have the lowest number of Environmental words in the S-1 of 38, 46, 50, and the Industry-adjusted Tobin's Q of 0.4828, 1.8765, and 0.4612 respectively. While the last three companies of the 4^o quartile, Warrior Met Coal LLC, Ramaco Resources Inc., Nexa Resources S.A., have the highest number of Environmental words in the S-1 of 2134, 2462, 3328, and the Industry-adjusted Tobin's Q of 0.0728, 0.6507, and 0.0139 respectively. Thus, showing an average more precise firm price evaluation. The difference between the other extreme quartiles of Social, Governance, and ESG are respectively of 0.0417, 0.1081, and 0.1107 points. The only lack of lowering Industry-adjusted Tobin's Q is between the 2^o and 3^o quartiles of Social. There the Industry-adjusted Tobin's Q increases only by 0.0009 points. Still, sorting IPOs by either Environmental, Social, Governance, or ESG word frequencies produces large firm evaluation differences between the quartiles. A large increase in the number of Environmental, Social, Governance, and ESG words (as the cumulative number of E, S, G) in the S-1 form leads to reduced information asymmetry and a more precise evaluation of the company. Furthermore, it will be essential to check if such a negative

correlation between these variables and the firm evaluation is significant to confirm the third hypothesis.

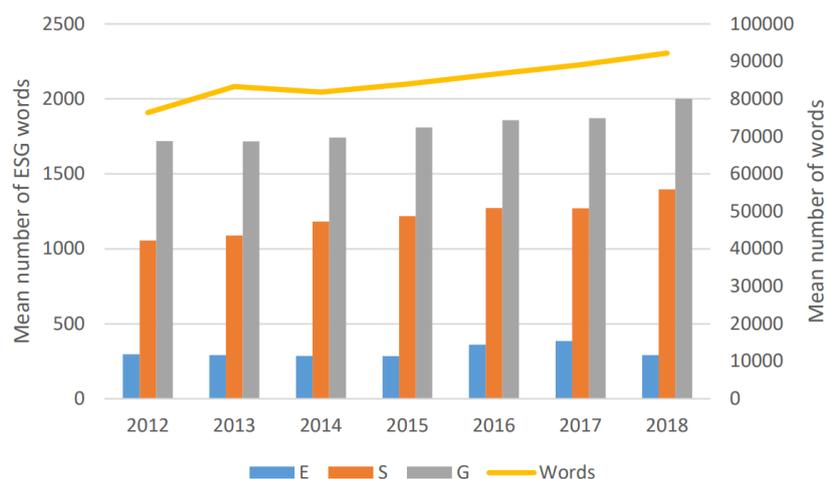


Figure 5. This graph plots the average number of words in the S-1 filings and the average number of E, S, G words in the same filing for the sample of 726 U.S. IPOs in the period 2012-2018. The full dataset is actually of 783 U.S. IPOs for the period 2012-(end of June)2019, but missing half of the last year meant it could not be shown not to induce visual misrepresentation of the data.

Figure 5 reports an increase over the years of the mean number of words present in the S-1 form and the mean number of ESG words. This chart shows that not only there is a trend that sees the S-1 forms on average become more prolonged and detailed, but also that the same is happening for the ESG disclosure as a whole. Such a trend may result from companies seeing as ever more critical to disclose more, and possibly be more detailed, on such topics. The mean number of words goes from 76340.79 in 2012 to 92220.68 in 2018, increasing 20.83%. The mean number of ESG, G, S, and E words changes respectively of +20.14%, +16.34%, +32.46%, and -1.66%. This shows that the only outlier is the Environmental topic, which receives less disclosure between, even though it receded from its 2017 level, where the increase from 2012 was 29.68%.

Table 2. IPO variables correlations statistics. This table reports the 2-tailed correlations statistics for the sample of 783 U.S. IPOs in the period 2012-(end of June)2019. The statistics for the IPO variables are: First-day returns is the natural logarithm of 1 + (the difference between the first-day closing price and the offer price, divided by the offer price), Industry-adjusted Tobin's Q is the natural logarithmic version of the firm's Tobin's Q divided by the median Tobin's Q in the firm's industry, Tobin's Q is the natural logarithm of the IPO's quarter-end total assets plus the market value minus the common equity, divided by the total assets, Price revision is the ratio between the offer price and the filing price range (minus 1), Shares overhanging is the number of shares retained divided by the number of shares in the initial public offering, Days between announcement and trading is the logarithm of the number of calendar days between the first S-1 filing and the IPO date, Firm age is the logarithm of 1 + the firm age at the IPO date, Proceeds is the logarithm of the total amount of IPO proceeds, Leverage (D/A) is the ratio of pre-IPO's quarter-end total debt to total assets, Lockup dummy equals to 1 if there is a lockup period (otherwise 0), Exchange dummy equals to 1 if the shares got listed on the Nasdaq exchange (0 if on the NYSE exchange), Primary dummy equals to 1 if the offering is 100% made of primary shares (otherwise 0), Tech dummy is a dummy assuming a value equal to 1 if the firm operates in the Technology sector, as defined by the SEC (otherwise 0). The statistics for the variables related to the mandatory disclosure by the firm (S-1 forms) are: Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list, Environmental (%), Social (%), Governance (%) are the percentage of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG (%) is the percentage of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list, Negative,

Positive, Uncertainty are the percentage of words within the S-1 that are classified as their tones using the Loughran and McDonald (2011) word list.

	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Price revision	Shares overhang	Days between announcement and trading	Firm age	Proceeds (D/A)	Lookup dummy	Exchange dummy	Primary dummy	Tech dummy	Environmental	Social	Governance	ESG	Environmental (%)	Social (%)	Governance (%)	ESG (%)	Negative	Positive	Uncertainty
First-day returns	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Industry-adjusted Tobin's Q	0.364***	0.855***	0.374***	0.069*	0.006	0.146***	0.295***	1.000	0.295***	1.000	0.150***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Tobin's Q	0.450***	0.305***	0.374***	0.069*	0.006	0.146***	0.295***	1.000	0.295***	1.000	0.150***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Price revision	0.480***	0.085**	0.122***	0.069*	0.006	0.146***	0.295***	1.000	0.295***	1.000	0.150***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Shares overhang	0.026	0.085**	0.122***	0.069*	0.006	0.146***	0.295***	1.000	0.295***	1.000	0.150***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Days between announcement and trading	-0.078**	-0.122***	-0.192***	-0.072**	0.006	0.146***	0.295***	1.000	0.295***	1.000	0.150***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Firm age	-0.013	-0.187***	-0.248***	-0.054	0.006	0.146***	0.295***	1.000	0.295***	1.000	0.150***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Proceeds	0.143***	-0.012	-0.063*	0.277***	-0.078**	0.295***	1.000	0.295***	1.000	0.295***	1.000	0.150***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	0.009
Leverage (D/A)	-0.066*	0.024	0.019	-0.041	-0.047	0.059*	-0.079**	-0.150***	1.000	0.009	0.009	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Lookup dummy	-0.007	0.036	0.029	0.012	0.070*	0.070*	-0.040	-0.020	0.010	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Exchange dummy	0.017	0.104***	0.159***	-0.076**	-0.014	-0.139**	-0.275***	-0.440***	0.057	0.009	0.009	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Primary dummy	-0.413***	-0.137***	-0.152***	-0.201***	0.065*	0.067*	-0.149***	-0.273***	0.120***	0.042	0.009	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Tech dummy	0.151***	-0.100**	0.226**	0.141***	0.084**	0.024	-0.003	0.128**	-0.048	0.005	-0.195***	-0.131***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009	0.009
Environmental	-0.168***	-0.165**	-0.388***	-0.138**	-0.031	0.100**	0.181**	0.259**	-0.097**	-0.012	-0.167**	-0.064	-0.372***	1.000	0.009	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Social	-0.080**	-0.087**	-0.031	-0.004	0.076**	-0.172**	0.035	0.208**	-0.093**	0.009	0.070*	-0.060*	-0.115**	0.296**	1.000	0.009	1.000	0.009	1.000	0.009	1.000	0.009
Governance	-0.107***	-0.204***	-0.192***	-0.014	0.118**	-0.082**	0.195**	0.400**	-0.106**	-0.025	-0.102**	-0.093**	-0.029	0.371***	0.813***	1.000	0.009	1.000	0.009	1.000	0.009	0.009
ESG	-0.129***	-0.180***	-0.219***	-0.038	0.082**	-0.083**	0.159**	0.373**	-0.120**	-0.013	-0.083**	-0.086**	-0.147**	0.610***	0.878***	0.927**	1.000	0.009	1.000	0.009	1.000	0.009
Environmental (%)	-0.093***	-0.077**	-0.292***	-0.073**	-0.052	0.130**	0.131**	0.175**	-0.061*	-0.011	-0.189**	-0.045	-0.233**	0.851***	-0.012	0.038	0.321***	1.000	0.009	1.000	0.009	0.009
Social (%)	0.071**	0.096**	0.198**	0.087**	-0.023	-0.107**	-0.102**	-0.085**	-0.012	0.012	0.136**	-0.072**	-0.034	-0.073**	0.625**	0.213**	0.320**	-0.109**	1.000	0.009	1.000	0.009
Governance (%)	0.098***	-0.015	0.038	0.120**	0.013	0.096**	0.140**	0.124**	0.005	-0.057	-0.151**	-0.145**	0.197**	-0.175**	0.121**	0.298**	0.140**	-0.133**	0.434**	1.000	0.009	0.009
ESG (%)	0.029	-0.005	-0.058	0.061*	-0.038	0.073**	0.099**	0.122**	-0.042	-0.029	-0.123**	-0.140**	-0.063*	0.402**	0.384**	0.287**	0.440**	-0.497**	0.680**	0.654**	1.000	0.009
Negative	0.050	0.093**	0.230**	0.020	0.023	-0.257***	-0.257**	-0.268**	0.027	0.038	0.321**	0.049	-0.113**	-0.155**	0.389**	0.094**	0.137**	-0.244**	0.539**	0.071**	1.000	0.009
Positive	0.029	0.039	0.144***	0.086**	-0.012	-0.086**	-0.012	-0.052	-0.035	-0.035	0.201**	-0.013	-0.069*	-0.134**	0.195**	0.006	0.012	-0.209**	0.338**	0.081**	1.000	0.009
Uncertainty	-0.024	0.143**	0.201**	0.010	-0.050	-0.290**	-0.377**	-0.369**	0.040	0.029	0.387**	0.071**	-0.218**	-0.111**	0.187**	-0.111**	-0.020	-0.105**	0.434**	0.003	0.163**	0.696**

* p < 0.100
 ** p < 0.050
 *** p < 0.010

Table 2 presents the correlation statistics at the IPO level and the ESG and sentiment topics at the S-1 level. It is interesting to notice a significant correlation between all the IPO variables and the First-day returns (underpricing), except for Shares overhanging, Firm age, Lockup dummy, and Exchange dummy. As shown in previous research (Leone et al. 2007; Loughran and McDonald 2013), Price revision is also relevant and positively correlated with underpricing, and our results make no exceptions. It is also interesting to see a significant correlation between all the IPO variables and Industry-adjusted Tobin's Q (firm evaluation), with the only exceptions of Leverage (D/A), Lockup dummy and Proceeds. Contrary to the other research (Jo and Harjoto 2011), Leverage (D/A) indeed is non-significant with Industry-adjusted Tobin's Q.

On the textual and sentiment analysis regarding the S-1 forms, all the variables significantly correlate with underpricing, except for ESG (%), Negative, Positive, and Uncertainty. Contrary to the other research (Loughran and McDonald 2013), the Negative and Uncertainty variables seem not to correlate with First-day returns significantly. It is also interesting to see a significant correlation between all the textual and sentiment variables and the Industry-adjusted Tobin's Q, with the only exceptions Governance (%), and ESG (%), and Positive.

Already here, it seems that the first and third hypotheses are confirmed. Environmental, Social, Governance, and ESG have in order a -0.168 , -0.080 , -0.107 , and -0.129 significant correlation with First-day returns, and a -0.165 , -0.087 , -0.204 , and -0.180 significant correlation with Industry-adjusted Tobin's Q. They are negative, confirming that disclosing ESG information diminishes the information asymmetry, thus bringing a positive benefit to the companies' financial performance (translated into a negative correlation with underpricing, since it is bad for the firm). Also, disclosing more ESG information improves the investors' ability to better evaluate the firm in the future (translated into a negative correlation with the post-IPO's Industry-adjusted Tobin's Q).

Those are partial results since it is essential to see if the dependent variables hold their sign and significance while working with others to explain the independent in the

regression. Any further comments on how the hypothesis get confirmed, or not, will be left for the results in chapter 4.

Finally, it is interesting to notice that the variables that correlate significantly with Price revision change regarding those correlated with First-day returns. Shares overhanging, ESG (%), and Positive stay positive but become significant, and Exchange dummy becomes negative and significant. Instead, Leverage (D/A), Social, Governance, and ESG all lose their significance.

4. Results

Our results primarily show a significant negative association between ESG variables and underpricing, price revision, and firm evaluation. Furthermore, the most negative relationship with underpricing, in order of magnitude, is found with the ESG topic as a whole, secondly the Governance, third the Social, and last the Environmental one while for the Industry-adjusted Tobin's Q the most negative relationship is found with Governance, ESG, Social, and Environmental. Price revision is instead associated with ESG, E, G, and S, in the order. We then perform robustness tests to see if the results are in line with the theory.

4.1 E, S, G, ESG and IPO's underpricing

Based on the first hypothesis that disclosing information diminishes the information asymmetry, and that ESG disclosures should bring positive benefits to the companies' financial performance, we postulate that first-day returns should be lower when Environmental, Social, and Governance topics are discussed at length in the S-1 prospectus. Thus, there should be a significant negative correlation between the E, S, G, and ESG topics and the underpricing.

Table 3. ESG topics and IPO's underpricing. This table shows the results for a set of ordinary least squares regressions where the dependent variable is First-day returns. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. First-day returns is the natural logarithm of $1 +$ (the difference between the first-day closing price and the offer price, divided by the offer price), Price revision is the ratio between the offer price and the filing price range (minus 1), Shares overhanging is the number of shares retained divided by the number of shares in the initial public offering, Days between announcement and trading is the logarithm of the number of calendar days between the first S-1 filing and the IPO date, Firm age is the logarithm of $1 +$ the firm age at the IPO date, Proceeds is the logarithm of the total amount of IPO proceeds, Leverage is the ratio of pre-IPO's quarter-end total debt to total assets, Lockup dummy equals to 1 if there is a lockup period (otherwise 0), Exchange dummy equals to 1 if the shares got listed on the Nasdaq exchange (0 if on the NYSE exchange), Primary dummy equals to 1 if the offering is 100% made of primary shares (otherwise 0), Tech dummy is a dummy assuming a value equal to 1 if the firm operates in the Technology sector, as defined by the SEC (otherwise 0). Negative is the percentage of words within the S-1 that are classified as negative using the Loughran and McDonald (2011) word list. Environmental, Social, Governance

are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list.

	(1)	(2)	(3)	(4)
	First-day returns	First-day returns	First-day returns	First-day returns
Environmental	-0.060** (-2.086)			
Social		-0.270*** (-4.037)		
Governance			-0.356*** (-4.322)	
ESG				-0.343*** (-4.496)
Price revision	0.655*** (12.670)	0.650*** (12.754)	0.637*** (12.426)	0.633*** (12.351)
Shares overhanging	0.001 (0.932)	0.002 (1.351)	0.002 (1.627)	0.002 (1.519)
Days between announcement and trading	-0.001 (-0.068)	-0.004 (-0.211)	-0.003 (-0.145)	-0.002 (-0.085)
Firm age	-0.003 (-0.165)	0.000 (0.020)	0.006 (0.304)	0.003 (0.140)
Proceeds	-0.007 (-0.350)	0.010 (0.528)	0.021 (1.018)	0.022 (1.083)
Leverage	-0.002 (-0.547)	-0.002 (-0.608)	-0.002 (-0.522)	-0.002 (-0.671)
Negative	1.927 (0.836)	6.341** (2.564)	4.155* (1.801)	4.533* (1.956)
Lockup dummy	0.038 (0.456)	0.038 (0.449)	0.026 (0.311)	0.030 (0.357)
Exchange dummy	0.035** (2.117)	0.044*** (2.667)	0.042** (2.584)	0.041** (2.497)
Primary dummy	-0.195*** (-11.254)	-0.196*** (-11.437)	-0.195*** (-11.382)	-0.196*** (-11.458)
Tech dummy	0.020 (1.104)	0.030* (1.804)	0.033** (2.013)	0.023 (1.385)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.355	0.365	0.367	0.368

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 3 shows ordinary least-squares linear regression models using First-day returns⁹ (underpricing) as a dependent variable. Looking at the ESG indicators, all the models evidence a significant negative relation between E, S, G, ESG and underpricing. Only E of the model (1) has a slightly higher p than the other three. These results confirm the first hypothesis that disclosing ESG information diminishes information asymmetry leading to lower underpricing, thus benefiting the companies' financial performance.

The negative association between the ESG disclosures in the S-1 form and the First-day returns holds after controlling for year effects, as well as for several variables commonly used to explain underpricing: offer price revision, shares overhanging, log of the number of days occurring between the IPO announcement and trading, log of 1 + the age of the IPO firm, log of proceeds, leverage of debt over assets, percentage of the number of

⁹ First-day returns is computed as the natural logarithm of 1 + (the difference between the first-day closing price and the offer price, divided by the offer price) as in Loughran and McDonald (2013), and Bajo and Raimondo (2017).

Loughran and McDonald (2011) negative words in the S-1 form, lockup period dummy, exchange dummy, pure primary shares dummy, and technology sector dummy.

The sign and the statistical significance of the control variables appear to be entirely in line with previous studies (Bradley and Jordan 2002; An and Chan 2008, Jaemin et al. 2008; Loughran and McDonald 2013; Bajo and Raimondo 2017) only for Price revision, and Exchange dummy, being both positive and significant. Shares overhanging should be positive and significant, Firm age and Leverage should be both negative and significant, while here they are never significant. Proceeds is nonsignificant as it should in all the models. Negative is positive and significant as it should in all the models except (1) where it is nonsignificant. Tech dummy should be positive and significant, being such in all models but (1) and (4) where it is nonsignificant. Primary Dummy is the only one curiously behaving completely differently as previously shown. It should be positive and significant, while here it is strangely always negative and significant. This result might be related to the fact that the models' specifications are slightly different. Finally, Lockup dummy and Days between announcement and trading¹⁰ result being nonsignificant in our model.

This effect's economic magnitude¹¹ is that one standard deviation in the Environmental, Social, Governance, and ESG variables¹² are respectively linked with a decrease in underpricing¹³ of 0.073, 0.141, 0.148, and 0.156 standard deviations. These results confute the second hypothesis that the most negative relationship with underpricing, in terms of magnitude, should be found in order with the G, E, S, and ESG variables. For U.S. IPOs' underpricing, the actual order seems to be ESG, Governance, Social, and Environmental topics. This result may due to the retail investors finding more useful the disclosure of all three ESG variables as a whole rather than singularly. The difference between ESG, G, and S variables' economic magnitudes is so tiny (only a 0.008 standard deviation between ESG and G, and a 0.007 standard deviation between G and S) that they could be all classified as being the most important together. Governance and Social may be the most dominant of the singular disclosures since they discuss

¹⁰ Days between announcement and trading is not often used in research.

¹¹ The economic magnitude is calculated by taking the B value of the independent variable in the Regression table (the value not in parenthesis) and multiplying it by the standard deviation of the same variable, then dividing the result by the standard deviation of the dependent variable.

¹² In their logarithmic forms.

¹³ In its natural logarithmic form, as explained in Table 3 legend.

fundamental topics for a new firm going public. Shareholder rights, executive pay, audits, internal controls, and the company's leadership on one side. Consumer protection, data security, human rights, working conditions, relationship with suppliers, employees, customers, communities in which the firm operates, and everything related to diversity in the workforce on the other side. They are all fundamental elements to quickly evaluate in the present the good points and the shortcomings of a company that is just about to go public. Environmental topics are the latter in terms of importance, probably because they mainly touch on pros and cons that may be considered too vague to evaluate a company's value in the present. The investors mainly use the company's waste, pollution, energy use, compliance with environmental regulations, treatment of animals, natural resource conservation, and everything related to climate change and sustainability to evaluate its environmental and climate risks. Investors may see these risks as too far away in the future or too vague and rare to consider them as relevant to evaluate a company's present value.

4.2 IPO's offer price revision

Price revision is well known for having a significant positive relationship with underpricing (An and Chan 2008; Loughran and McDonald 2013), as seen in Table 3. Thus, we expect to see the independent variables explaining Price revision having the same positive or negative effect that they have in explaining the underpricing.

Table 4. ESG topics and IPO's price revision. This table shows the results for a set of ordinary least squares regressions where the dependent variable is Price revision. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. The variables' descriptions are the same as in Table 3.

	(5)	(6)	(7)	(8)
	Price revision	Price revision	Price revision	Price revision
Environmental	-0.093*** (-4.751)			
Social		-0.153*** (-3.251)		
Governance			-0.269*** (-4.694)	
ESG				-0.262*** (-4.940)
Shares overhanging	0.002*** (2.749)	0.003*** (3.018)	0.003*** (3.414)	0.003*** (3.307)
Days between announcement and trading	-0.009 (-0.632)	-0.015 (-1.020)	-0.014 (-0.929)	-0.013 (-0.861)
Firm age	-0.044*** (-3.351)	-0.044*** (-3.330)	-0.038*** (-2.902)	-0.040*** (-3.085)
Proceeds	0.110*** (8.417)	0.111*** (8.157)	0.122*** (8.810)	0.123*** (8.913)
Leverage	0.001 (0.333)	0.001 (0.570)	0.001 (0.592)	0.001 (0.426)
Negative	2.486 (1.544)	5.542*** (3.175)	4.577*** (2.824)	4.868*** (2.994)
Lockup dummy	-0.022 (-0.374)	-0.019 (-0.326)	-0.029 (-0.486)	-0.026 (-0.439)
Exchange dummy	0.005 (0.412)	0.013 (1.129)	0.013 (1.118)	0.012 (1.020)
Primary dummy	-0.045*** (-3.726)	-0.047*** (-3.872)	-0.045*** (-3.783)	-0.046*** (-3.850)
Tech dummy	0.002 (0.137)	0.024** (2.025)	0.025** (2.124)	0.017 (1.434)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.163	0.150	0.162	0.165

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 4 shows ordinary least-squares linear regression models using Price revision as a dependent variable. Looking at the ESG indicators, all the models evidence a significant negative relation between E, S, G, ESG and Price revision, like it is for the underpricing, but now all these variables are significant at the same level. The order of magnitude instead changes to ESG, E, G, and last S. One standard deviation in those variables is respectively linked with a decrease in price revision of 0.194, 0.183, 0.182, and 0.130 standard deviations. The sign and the statistical significance of the control variables appear to be entirely in line with least-squares linear regression models using First-day returns with only a few exceptions. Shares overhanging and Proceeds now become significant and positive for all the models. Firm age becomes highly significant and negative. Exchange dummy instead loses its significance in all the models.

4.3 E, S, G, ESG and the firm's evaluation

Based on the third hypothesis that ESG disclosures should bring positive benefits to the companies' financial performance, this paper postulates that investors should evaluate more precisely the firm when Environmental, Social, and Governance topics are discussed at length in the S-1 prospectus. Thus, there should be a significant negative correlation between the E, S, G, and ESG (as the sum of the other three variables together) topics and the industry-adjusted Tobin's Q.

Table 5. ESG topics and IPO's quarter-end firm evaluation. This table shows the results for a set of ordinary least squares regressions where the dependent variable is Industry-adjusted Tobin's Q. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Industry-adjusted Tobin's Q is the natural logarithmic version of the firm's Tobin's Q divided by the median Tobin's Q in the firm's industry, the other variables' descriptions are the same as in Table 3.

	(9)	(10)	(11)	(12)
	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q
Environmental	-0.051* (-1.651)			
Social		-0.238*** (-2.954)		
Governance			-0.559*** (-5.670)	
ESG				-0.409*** (-4.505)
First-day returns	0.293*** (6.784)	0.281*** (6.489)	0.262*** (6.138)	0.267*** (6.189)
Price revision	0.257*** (3.785)	0.262*** (3.901)	0.238*** (3.588)	0.242*** (3.612)
Shares overhanging	0.003* (1.704)	0.003** (2.057)	0.004*** (2.740)	0.003** (2.328)
Days between announcement and trading	-0.037 (-1.473)	-0.040 (-1.630)	-0.038 (-1.552)	-0.036 (-1.464)
Firm age	-0.089*** (-3.994)	-0.087*** (-3.904)	-0.075*** (-3.420)	-0.082*** (-3.703)
Proceeds	-0.010 (-0.436)	0.005 (0.221)	0.040* (1.659)	0.028 (1.130)
Leverage	0.004 (1.136)	0.004 (1.088)	0.004 (1.071)	0.003 (0.972)
Negative	-1.411 (-0.515)	2.415 (0.812)	1.716 (0.629)	1.606 (0.580)
Lockup dummy	0.103 (1.022)	0.104 (1.034)	0.083 (0.845)	0.092 (0.928)
Exchange dummy	0.029 (1.474)	0.035* (1.819)	0.037* (1.952)	0.036* (1.842)
Primary dummy	-0.019 (-0.859)	-0.024 (-1.067)	-0.026 (-1.205)	-0.026 (-1.170)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.198	0.204	0.228	0.216

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 5 shows ordinary least-squares linear regression models using Industry-adjusted Tobin's Q (firm evaluation) as a dependent variable. Looking at the ESG indicators, all the models evidence a significant negative relation between E, S, G, ESG and underpricing. Only E of the model (9) has a higher p than the other three. These results confirm the third hypothesis that disclosing ESG information makes for a better firm evaluation leading to a lower industry-adjusted Tobin's Q.

The negative association between the ESG disclosures in the S-1 form and the Industry-adjusted Tobin's Q holds after controlling for year effects, as well as for several variables commonly used to explain the firm value (Tobin's Q and Industry-adjusted Tobin's Q) and the similar topic of rightly pricing the IPO's shares (underpricing): natural logarithm of 1 + (the difference between the first-day closing price and the offer price, divided by the offer price), offer price revision, shares overhanging, log of the number of days occurring between the IPO announcement and trading, log of 1 + the age of the IPO firm, log of proceeds, leverage of debt over assets, percentage of the number of Loughran and McDonald (2011) negative words in the S-1 form, lockup period dummy, exchange dummy, and pure primary shares dummy¹⁴.

The sign and the statistical significance of the control variables appear different from previous studies (Jo and Harjoto 2011; Arend and Park 2014). Leverage should be positive and significant, while here it is never significant in any model. Firm age is negative and significant, while it should be positive. First-day returns and Proceeds should not be significant, while here they are. First-day returns is positive and significant in all the models, while Proceeds is significantly positive only in model (11). This result might be related to the fact that the models' specifications are slightly different. As expected, Price revision is also positive and significant, being strongly correlated to underpricing, like shown in Table 3 and past research (An and Chan 2008; Loughran and McDonald 2013). Shares overhanging is positive and significant. Exchange dummy is significantly positive in all but model (9). Finally, Days between announcement and trading, Negative, Lockup dummy, and Primary dummy are all non-significant. Coming back to the underpricing, being positive and significant is another sign that our hypothesis is correct, since our E, S, G, and ESG variables are significantly negatively correlated with First-day returns, as shown in Table 3. Thus, showing that a more correctly priced IPO leads to a more precise post-IPO firm evaluation (in terms of lower Industry-adjusted Tobin's Q), while an underpriced IPO leads to the opposite.

This effect's economic magnitude is that one standard deviation in the Environmental, Social, Governance, and ESG variables are respectively linked with a decrease in Industry-adjusted Tobin's Q of 0.058, 0.116, 0.217, and 0.174 standard deviations. These

¹⁴ The technology sector dummy is not present, like in the other regressions, since the Tobin's Q is already adjusted for the industry effects. Thus, the utilization of the Tech dummy would have been redundant.

results confute the fourth hypothesis that the most negative relationship with firm evaluation, in terms of magnitude, should be found in order with the G, E, S, and ESG variables. For U.S. firms' value, the actual order seems to be Governance, ESG, Social, and Environmental topics.

This result may be due to the retail investors finding more useful the specific disclosure of Governance since it discusses fundamental topics for a new firm going public. Shareholder rights, executive pay, audits, internal controls, and the company's leadership are all fundamental elements to precisely evaluate a firm. ESG disclosure as a whole may be the second in line because of its broadness and ability to encompass all the "hot" topics wanted by the investors. Social disclosure may be the next in line for importance since it touches essential topics like consumer protection, data security, human rights, working conditions, relationship with suppliers, employees, customers, communities in which the firm operates, and everything related to diversity in the workforce. Those company's elements are also essential to evaluate the firm's value, however they may be considered at a lower level of importance if put in comparison with the Governance ones, which are specific for public companies to reassure investors that there will be no agency conflicts. Like in Table 3, Environmental topics are the latter in terms of importance, probably because they mainly touch on pros and cons considered too vague and difficult to verify and measure. The investors mainly use the company's waste, pollution, energy use, compliance with environmental regulations, treatment of animals, natural resource conservation, and everything related to climate change and sustainability to evaluate its environmental and climate risks. Investors may see these risks as too far away in the future or too vague and rare to consider them as primarily relevant to better ponder a firm value.

5. Robustness checks

This section tests First-day returns, Price revision, and Industry-adjusted Tobin's Q least-squares linear regression models for robustness by changing a few variables and using some new ones expected to have a definite effect on the dependent variables. We swap the control variable Negative with Positive and Uncertainty¹⁵. We also change the

¹⁵ We do such only for the regressions with First-day returns and Price revision as dependent variables, since that is where we expect to see some known effects. We cannot find any research done on any form of Tobin's Q regarding

E, S, G, and ESG variables to be the percentage of the number of such words in the S-1 form. We then do a more econometrics-robustness test for the underpricing and firm evaluation and remake the regressions with the dataset divided between Tech, as categorized by the SEC, and non-Tech companies¹⁶¹⁷. We also divide the sample based on the year the IPOs happened, between 2012 and 2015, and between 2016 and 2019¹⁸.

Table 6 and 7. Robustness check on ESG topics and IPO's underpricing. These tables show the results for a set of ordinary least squares regressions where the dependent variable is First-day returns. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Positive and Uncertainty sentiments (separately) and year fixed effects. First-day returns is the natural logarithm of 1 + (the difference between the first-day closing price and the offer price, divided by the offer price), Price revision is the ratio between the offer price and the filing price range (minus 1), Shares overhanging is the number of shares retained divided by the number of shares in the initial public offering, Days between announcement and trading is the logarithm of the number of calendar days between the first S-1 filing and the IPO date, Firm age is the logarithm of 1 + the firm age at the IPO date, Proceeds is the logarithm of the total amount of IPO proceeds, Leverage is the ratio of pre-IPO's quarter-end total debt to total assets, Lockup dummy equals to 1 if there is a lockup period (otherwise 0), Exchange dummy equals to 1 if the shares got listed on the Nasdaq exchange (0 if on the NYSE exchange), Primary dummy equals to 1 if the offering is 100% made of primary shares (otherwise 0), Tech dummy is a dummy assuming a value equal to 1 if the firm operates in the Technology sector, as defined by the SEC (otherwise 0). Positive is the percentage of words within the S-1 that are classified as positive using the Loughran and McDonald (2011) word list, Uncertainty is the percentage of words within the S-1 that are classified as uncertain using the Loughran and McDonald (2011) word list. Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are

the sentiment analysis, thus we do not change the Negative variable into Positive and Uncertainty because we cannot expect any known effect to check for robustness.

¹⁶ In such case, we use the Tobin's Q variable as dependent instead of the Industry-adjusted Tobin's Q, since it would make no sense to use an industry-adjusted variable when the dataset is divided in Tech and non-Tech.

¹⁷ We also did the regressions changing the Leverage into Leverage (D/E), calculated as the ratio of pre-IPO's quarter-end total debt to total stockholders' equity. We do not show those regressions since they bring almost identical results as the ones with the most used Leverage, calculated as the ratio of pre-IPO's quarter-end total debt to total assets.

¹⁸ The year 2019 only contains the IPOs until the end of June.

classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list.

	(13)	(14)	(15)	(16)
	First-day returns	First-day returns	First-day returns	First-day returns
Environmental	-0.068** (-2.355)			
Social		-0.198*** (-3.164)		
Governance			-0.332*** (-4.080)	
ESG				-0.314*** (-4.195)
Price revision	0.663*** (12.807)	0.667*** (13.052)	0.651*** (12.700)	0.649*** (12.657)
Shares overhanging	0.001 (0.910)	0.002 (1.219)	0.002 (1.556)	0.002 (1.446)
Days between announcement and trading	-0.003 (-0.156)	-0.011 (-0.517)	-0.008 (-0.385)	-0.007 (-0.349)
Firm age	-0.003 (-0.185)	-0.006 (-0.316)	0.002 (0.103)	-0.001 (-0.075)
Proceeds	-0.009 (-0.450)	-0.005 (-0.242)	0.012 (0.604)	0.012 (0.614)
Leverage	-0.002 (-0.624)	-0.002 (-0.568)	-0.002 (-0.556)	-0.002 (-0.690)
Positive	-5.846 (-1.325)	-2.097 (-0.476)	-4.586 (-1.058)	-4.601 (-1.062)
Lockup dummy	0.035 (0.415)	0.043 (0.509)	0.028 (0.330)	0.032 (0.378)
Exchange dummy	0.040** (2.428)	0.049*** (2.968)	0.049*** (2.985)	0.048*** (2.924)
Primary dummy	-0.196*** (-11.316)	-0.198*** (-11.466)	-0.197*** (-11.454)	-0.198*** (-11.524)
Tech dummy	0.017 (0.900)	0.029* (1.734)	0.031* (1.875)	0.022 (1.292)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.356	0.359	0.365	0.366

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 7.

	(17)	(18)	(19)	(20)
	First-day returns	First-day returns	First-day returns	First-day returns
Environmental	-0.064** (-2.260)			
Social		-0.191*** (-3.044)		
Governance			-0.336*** (-4.135)	
ESG				-0.308*** (-4.114)
Price revision	0.667*** (12.827)	0.672*** (13.139)	0.655*** (12.798)	0.653*** (12.718)
Shares overhanging	0.001 (0.773)	0.001 (1.103)	0.002 (1.420)	0.002 (1.315)
Days between announcement and trading	-0.009 (-0.426)	-0.014 (-0.686)	-0.014 (-0.653)	-0.012 (-0.571)
Firm age	-0.013 (-0.704)	-0.012 (-0.634)	-0.008 (-0.412)	-0.010 (-0.518)
Proceeds	-0.018 (-0.925)	-0.012 (-0.573)	0.003 (0.147)	0.004 (0.184)
Leverage	-0.002 (-0.602)	-0.002 (-0.568)	-0.002 (-0.558)	-0.002 (-0.678)
Uncertainty	-7.061* (-1.807)	-4.733 (-1.199)	-7.258* (-1.873)	-6.031 (-1.556)
Lockup dummy	0.043 (0.512)	0.046 (0.553)	0.034 (0.410)	0.038 (0.457)
Exchange dummy	0.041** (2.489)	0.050*** (3.061)	0.051*** (3.101)	0.049*** (2.983)
Primary dummy	-0.197*** (-11.397)	-0.199*** (-11.520)	-0.198*** (-11.549)	-0.199*** (-11.590)
Tech dummy	0.012 (0.666)	0.026 (1.509)	0.026 (1.522)	0.018 (1.032)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.357	0.360	0.367	0.367

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 6 and 7 show ordinary least-squares linear regression models using First-day returns as a dependent variable. Unlike Table 3, we swap the Negative sentiment variable for the Positive and Uncertainty ones. From the Loughran and McDonald (2013) theory, this paper expects to see a negative relationship between Positive and First-day returns, and a positive one between Uncertainty and First-day returns.

From the Positive variable's side, a higher percentage of positive words in the S-1 form seems to lower underpricing and confirm the theory, even though the variable is nonsignificant in all the models. Instead, the Uncertainty variable does not perform as expected, but oppositely. It shows that there may be a negative relation between Uncertainty and underpricing. A higher percentage of uncertainty words lead to lower underpricing, even though it is significant only in models (17) and (19). This result might be related to the models' specifications being slightly different. The remaining models are similar to the one in Table 3, except that the Tech dummy is nonsignificant in models (18) and (19) of Table 7. Also, models (13) of table 6 and model (17) of Table 7

both seem to explain overall a little bit better the First-day return. The adjusted R-squared goes from 0.355 in Table 3 to 0.356 and 0.357 in Table 6 and 7 respectively.

Table 8. Robustness check on ESG topics and IPO's underpricing. This table shows the results for a set of ordinary least squares regressions where the dependent variable is First-day returns. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Negative is the percentage of words within the S-1 that are classified as negative using the Loughran and McDonald (2011) word list. Environmental percentage, Social percentage, Governance percentage are the percentage of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG percentage is the cumulative percentage of the number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(21) First-day returns	(22) First-day returns	(23) First-day returns	(24) First-day returns
Environmental percentage	-2.071 (-0.825)			
Social percentage		-1.905 (-0.591)		
Governance percentage			1.064 (0.351)	
ESG percentage				-0.922 (-0.604)
Price revision	0.671*** (13.094)	0.676*** (13.187)	0.672*** (13.125)	0.675*** (13.192)
Shares overhanging	0.001 (0.858)	0.001 (0.852)	0.001 (0.882)	0.001 (0.854)
Days between announcement and trading	-0.004 (-0.195)	-0.005 (-0.220)	-0.006 (-0.284)	-0.004 (-0.180)
Firm age	-0.005 (-0.246)	-0.004 (-0.223)	-0.005 (-0.283)	-0.004 (-0.193)
Proceeds	-0.016 (-0.820)	-0.017 (-0.903)	-0.017 (-0.920)	-0.016 (-0.854)
Leverage	-0.001 (-0.404)	-0.001 (-0.368)	-0.001 (-0.373)	-0.001 (-0.369)
Negative	2.066 (0.883)	3.164 (1.208)	2.291 (0.983)	2.738 (1.162)
Lockup dummy	0.041 (0.488)	0.041 (0.490)	0.044 (0.518)	0.040 (0.469)
Exchange dummy	0.037** (2.210)	0.038** (2.314)	0.039** (2.340)	0.037** (2.232)
Primary dummy	-0.196*** (-11.276)	-0.196*** (-11.258)	-0.195*** (-11.185)	-0.196*** (-11.251)
Tech dummy	0.032* (1.853)	0.037** (2.184)	0.035** (2.082)	0.036** (2.118)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.352	0.351	0.351	0.351

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 8 shows ordinary least-squares linear regression models using First-day returns as a dependent variable. Unlike Table 3, the E, S, G, and ESG variables are not the logarithm of the number of such words in the S-1 form, but their percentage regarding the whole S-1.

Such new variables are nonsignificant and negative, except Governance percentage, which becomes positive. Compared to Table 3, Negative loses its significance in models (22), (23), and (24), and Tech dummy earns significance also in models (21) and (24). All the rest stay almost the same. Importantly, Table 8 with the percentage of the ESG

variables explains less the model than Table 3 with the logarithm of the number of words about the ESG topics.

Table 9 and 10. Robustness check on ESG topics and IPO's price revision. These tables show the results for a set of ordinary least squares regressions where the dependent variable is Price revision. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Positive and Uncertainty sentiments (separately) and year fixed effects. Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(25)	(26)	(27)	(28)
	Price revision	Price revision	Price revision	Price revision
Environmental	-0.091*** (-4.592)			
Social		-0.116*** (-2.635)		
Governance			-0.239*** (-4.219)	
ESG				-0.228*** (-4.373)
Shares overhanging	0.002*** (2.798)	0.003*** (3.016)	0.003*** (3.399)	0.003*** (3.295)
Days between announcement and trading	-0.012 (-0.825)	-0.020 (-1.399)	-0.018 (-1.277)	-0.018 (-1.239)
Firm age	-0.047*** (-3.682)	-0.052*** (-3.987)	-0.045*** (-3.496)	-0.048*** (-3.690)
Proceeds	0.106*** (8.214)	0.101*** (7.695)	0.114*** (8.370)	0.114*** (8.421)
Leverage	0.001 (0.405)	0.001 (0.713)	0.001 (0.689)	0.001 (0.547)
Positive	5.950* (1.934)	9.445*** (3.046)	7.838** (2.574)	7.812** (2.567)
Lockup dummy	-0.014 (-0.238)	-0.005 (-0.088)	-0.016 (-0.268)	-0.013 (-0.219)
Exchange dummy	0.004 (0.321)	0.012 (0.991)	0.012 (1.052)	0.011 (0.987)
Primary dummy	-0.045*** (-3.751)	-0.047*** (-3.924)	-0.046*** (-3.847)	-0.047*** (-3.913)
Tech dummy	0.002 (0.155)	0.024** (2.001)	0.024** (2.055)	0.017 (1.444)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.165	0.149	0.161	0.162

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 10.

	(29)	(30)	(31)	(32)
	Price revision	Price revision	Price revision	Price revision
Environmental	-0.094*** (-4.814)			
Social		-0.118*** (-2.677)		
Governance			-0.236*** (-4.157)	
ESG				-0.236*** (-4.532)
Shares overhanging	0.003*** (2.978)	0.003*** (3.228)	0.003*** (3.558)	0.003*** (3.511)
Days between announcement and trading	-0.006 (-0.422)	-0.014 (-0.917)	-0.013 (-0.881)	-0.012 (-0.791)
Firm age	-0.037*** (-2.796)	-0.038*** (-2.865)	-0.035** (-2.592)	-0.036*** (-2.671)
Proceeds	0.115*** (8.698)	0.112*** (8.208)	0.123*** (8.790)	0.125*** (8.950)
Leverage	0.001 (0.371)	0.001 (0.665)	0.001 (0.653)	0.001 (0.504)
Uncertainty	7.116*** (2.619)	9.022*** (3.253)	7.311*** (2.682)	8.183*** (3.011)
Lockup dummy	-0.022 (-0.376)	-0.017 (-0.284)	-0.025 (-0.428)	-0.023 (-0.391)
Exchange dummy	0.003 (0.243)	0.012 (1.032)	0.013 (1.087)	0.011 (0.986)
Primary dummy	-0.043*** (-3.605)	-0.046*** (-3.765)	-0.045*** (-3.717)	-0.045*** (-3.761)
Tech dummy	0.006 (0.472)	0.030** (2.488)	0.029** (2.446)	0.022* (1.869)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.168	0.151	0.162	0.165

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 9 and 10 show ordinary least-squares linear regression models using Price revision as a dependent variable. Unlike Table 4, we swap the Negative sentiment variable for the Positive and Uncertainty ones. Following the fact that Price revision is well known as having a significant positive relationship with underpricing, based on this paper findings, we expect to find a negative relationship between both Positive and Uncertainty, and Price revision.

We find them to be ultimately the opposite. Positive is significant, and a higher percentage of positive words in the S-1 seems to lead to a higher IPO price revision. This result contrasts with what the theory suggests and what Table 6 finds, but it is possible since the Positive variable there was nonsignificant. Uncertainty is positive and significant too, going against what is found in Table 7 (negative and significant in models (17) and (19) and not significant in the other two), but following the other research theory and results (Loughran and McDonald 2013). Uncertainty should increase underpricing, thus it makes sense that it increases the price revision too. As

for the rest, the models are similar to the one in Table 4. The only exception is that the Tech dummy becomes significant also in model (32) of Table 10. Also, model (25) of Table 9 and model (29) and (30) of Table 10 seem to explain overall a little bit better the Price revision of models (5) and (6) in Table 4. The adjusted R-squared goes from 0.163 in model (5) of Table 4 to 0.165 and 0.168 in model (25) of Table 9 and model (29) of Table 10 respectively. And from 0.150 in model (6) of Table 4 to 0.151 in model (30) of Table 10.

Table 11. Robustness check on ESG topics and IPO's price revision. This table shows the results for a set of ordinary least squares regressions where the dependent variable is Price revision. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Environmental percentage, Social percentage, Governance percentage are the percentage of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG percentage is the cumulative percentage of the number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(33) Price revision	(34) Price revision	(35) Price revision	(36) Price revision
Environmental percentage	-3.393* (-1.919)			
Social percentage		4.771** (2.103)		
Governance percentage			3.984* (1.866)	
ESG percentage				0.829 (0.768)
Shares overhanging	0.002*** (2.618)	0.002*** (2.760)	0.002*** (2.682)	0.002*** (2.703)
Days between announcement and trading	-0.014 (-0.929)	-0.017 (-1.166)	-0.018 (-1.237)	-0.017 (-1.142)
Firm age	-0.047*** (-3.584)	-0.047*** (-3.619)	-0.050*** (-3.789)	-0.048*** (-3.622)
Proceeds	0.098*** (7.611)	0.095*** (7.412)	0.095*** (7.359)	0.095*** (7.353)
Leverage	0.001 (0.663)	0.002 (0.810)	0.001 (0.687)	0.002 (0.790)
Negative	2.760* (1.674)	1.487 (0.805)	2.850* (1.735)	3.077* (1.849)
Lockup dummy	-0.018 (-0.302)	-0.016 (-0.270)	-0.009 (-0.159)	-0.015 (-0.254)
Exchange dummy	0.008 (0.647)	0.010 (0.887)	0.012 (1.029)	0.011 (0.955)
Primary dummy	-0.047*** (-3.904)	-0.044*** (-3.626)	-0.045*** (-3.667)	-0.046*** (-3.735)
Tech dummy	0.021* (1.711)	0.027** (2.334)	0.024** (1.992)	0.029** (2.421)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.142	0.143	0.142	0.139

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 11 shows ordinary least-squares linear regression models using Price revision as a dependent variable. Unlike Table 4, the E, S, G, and ESG variables are not the

logarithm of the number of such words in the S-1 form, but their percentage regarding the whole S-1.

Such new variables are expected to behave like the ones in Table 8, because of the high positive correlation between Price revision and underpricing. They should all be non-significant. Contrary to this belief, Environmental percentage is negative and significant, Social percentage and Governance percentage significantly positive, while ESG percentage is not significant. As for the rest, Negative is not significant anymore in models (34), compared to model (6) of Table 4, while Tech dummy earns significance also in models (33) and (36). Importantly, Table 11 with the percentage of the ESG variables explains less the model than Table 4 with the logarithm of the number of words about the ESG topics.

Table 12. Robustness check on ESG topics and IPO's quarter-end firm evaluation. These tables show the results for a set of ordinary least squares regressions where the dependent variable is Industry-adjusted Tobin's Q. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Industry-adjusted Tobin's Q is the natural logarithmic version of the firm's Tobin's Q divided by the median Tobin's Q in the firm's industry, Environmental percentage, Social percentage, Governance percentage are the percentage of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG percentage is the cumulative percentage of the number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(37)	(38)	(39)	(40)
	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q
Environmental percentage	-0.060 (-0.021)			
Social percentage		4.840 (1.260)		
Governance percentage			-3.628 (-1.021)	
ESG percentage				0.110 (0.061)
First-day returns	0.300*** (6.964)	0.301*** (7.006)	0.301*** (7.003)	0.300*** (6.973)
Price revision	0.271*** (4.015)	0.265*** (3.917)	0.276*** (4.082)	0.271*** (4.020)
Shares overhanging	0.003* (1.719)	0.003* (1.776)	0.003* (1.731)	0.003* (1.723)
Days between announcement and trading	-0.041* (-1.661)	-0.043* (-1.734)	-0.039 (-1.581)	-0.042* (-1.665)
Firm age	-0.091*** (-4.096)	-0.092*** (-4.131)	-0.089*** (-3.948)	-0.091*** (-4.089)
Proceeds	-0.019 (-0.824)	-0.019 (-0.840)	-0.018 (-0.791)	-0.019 (-0.831)
Leverage	0.004 (1.265)	0.005 (1.291)	0.005 (1.311)	0.004 (1.269)
Negative	-1.132 (-0.408)	-3.005 (-0.965)	-0.704 (-0.255)	-1.161 (-0.413)
Lockup dummy	0.107 (1.064)	0.108 (1.074)	0.101 (0.998)	0.107 (1.066)
Exchange dummy	0.029 (1.495)	0.029 (1.512)	0.027 (1.374)	0.029 (1.498)
Primary dummy	-0.019 (-0.866)	-0.017 (-0.750)	-0.021 (-0.942)	-0.019 (-0.855)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	783	783	783	783
Adjusted R-squared	0.195	0.197	0.196	0.195

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 12 shows ordinary least-squares linear regression models using Industry-adjusted Tobin's Q as a dependent variable. Unlike Table 5, the E, S, G, and ESG variables are not the logarithm of the number of such words in the S-1 form, but their percentage regarding the whole S-1.

Such new variables are all nonsignificant. Compared to Table 5, Proceeds loses its only significance in model (39), Exchange dummy loses too its significance in models (38), (39), and (40), while Days between announcement and trading gains a negative significance in models (37), (38), and (40). All the rest stay almost the same. Importantly Table 12, with the percentage of the ESG variables, explains less the model than Table 5 with the logarithm of the number of words about the ESG topics.

Table 13. ESG topics and IPO's underpricing of Tech firms. The sample now includes 175 U.S. IPOs categorized by the SEC as part of the Technological sector. This table shows the results for a set of ordinary least squares regressions where the dependent variable is First-day returns. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(41) First-day returns	(42) First-day returns	(43) First-day returns	(44) First-day returns
Environmental	-0.121* (-1.828)			
Social		-0.184 (-1.147)		
Governance			-0.392** (-2.182)	
ESG				-0.336* (-1.875)
Price revision	0.483*** (4.474)	0.512*** (4.800)	0.480*** (4.503)	0.482*** (4.476)
Shares overhanging	0.005 (0.875)	0.007 (1.138)	0.007 (1.215)	0.007 (1.176)
Days between announcement and trading	0.071 (1.528)	0.062 (1.326)	0.072 (1.560)	0.072 (1.538)
Firm age	-0.079 (-1.530)	-0.093* (-1.807)	-0.080 (-1.565)	-0.081 (-1.560)
Proceeds	0.042 (1.200)	0.044 (1.202)	0.058 (1.602)	0.055 (1.498)
Leverage	-0.098*** (-2.716)	-0.098*** (-2.680)	-0.092** (-2.551)	-0.092** (-2.545)
Negative	15.949*** (2.843)	16.066*** (2.827)	15.496*** (2.781)	15.922*** (2.841)
Lockup dummy	-0.375** (-2.112)	-0.372** (-2.080)	-0.396** (-2.233)	-0.388** (-2.182)
Exchange dummy	0.047* (1.674)	0.055** (1.980)	0.054* (1.949)	0.053* (1.903)
Primary dummy	-0.292*** (-6.520)	-0.300*** (-6.627)	-0.296*** (-6.645)	-0.298*** (-6.654)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	175	175	175	175
Adjusted R-squared	0.458	0.451	0.463	0.459

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 14. ESG topics and IPO's underpricing of non-Tech firms. The sample now includes 608 U.S. IPOs not categorized by the SEC as part of the Technological sector. This table shows the results for a set of ordinary least squares regressions where the dependent

variable is First-day returns. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(45)	(46)	(47)	(48)
	First-day returns	First-day returns	First-day returns	First-day returns
Environmental	-0.045 (-1.412)			
Social		-0.264*** (-3.512)		
Governance			-0.315*** (-3.348)	
ESG				-0.319*** (-3.708)
Price revision	0.662*** (11.231)	0.655*** (11.284)	0.646*** (11.058)	0.642*** (10.982)
Shares overhanging	0.001 (0.403)	0.001 (0.791)	0.001 (1.026)	0.001 (0.965)
Days between announcement and trading	-0.010 (-0.409)	-0.014 (-0.621)	-0.013 (-0.571)	-0.012 (-0.532)
Firm age	0.002 (0.081)	0.006 (0.312)	0.010 (0.495)	0.007 (0.343)
Proceeds	-0.030 (-1.270)	-0.008 (-0.341)	-0.001 (-0.028)	0.003 (0.139)
Leverage	-0.001 (-0.433)	-0.002 (-0.515)	-0.001 (-0.416)	-0.002 (-0.554)
Negative	0.790 (0.305)	5.525* (1.961)	3.054 (1.175)	3.486 (1.336)
Lockup dummy	0.120 (1.263)	0.120 (1.273)	0.112 (1.188)	0.114 (1.208)
Exchange dummy	0.026 (1.257)	0.034* (1.672)	0.032 (1.587)	0.031 (1.532)
Primary dummy	-0.190*** (-10.071)	-0.189*** (-10.134)	-0.189*** (-10.096)	-0.189*** (-10.156)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	608	608	608	608
Adjusted R-squared	0.332	0.343	0.342	0.345

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 13 shows ordinary least-squares linear regression models using First-day returns as a dependent variable, but having only Tech companies in the sample.

Differently from Table 3, which had the whole sample of companies, the Social variable loses its significance. This result may mean that, for Tech companies, Social disclosure is not essential during the IPO. Even though it touches essential topics for Tech companies, like consumer protection, data security, human rights, working conditions, relationship with suppliers, employees, customers, communities in which the firm operates, and everything related to diversity in the workforce. Even if necessary, all these social topics might be considered at a lower level of importance if compared, for example, with the Governance ones, specific for public companies to reassure investors that there will be no agency conflicts. Now, the order of magnitude is that one standard deviation in the significant Environmental, Governance, and ESG variables are respectively linked with a decrease in underpricing of 0.117, 0.152, and 0.132 standard

deviations. Thus, for tech firms, the order changes from Table 3, with G, ESG, and E in order of importance.

There are quite a few other differences when comparing only Tech companies to the whole sample. Firm age becomes negatively significant in models (42). Leverage becomes negatively significant in all the models, oppositely to Jaemin et al. that found a positive one for tech firms (2008). Negative interestingly earns positive significance in model (41) compared to model (1) of Table 3. Lockup dummy becomes finally negative and significant in all the models, like it was supposed to be in Table 3, where instead was positive and nonsignificant. All the rest changes slightly.

Table 14 shows ordinary least-squares linear regression models using First-day returns as a dependent variable, but having all the sample companies, except the Tech ones.

Differently from Table 3, which had the whole sample of companies, the Environmental variable loses its significance. This result may mean that Environmental disclosures are essential only for Tech companies. Vice versa, looking at Table 13, the Social one is important only for the other companies. Environmental topics may not be significant for non-tech companies because they mainly touch on pros and cons considered too vague to evaluate a company's value in the present. The investors mainly use the company's waste, pollution, energy use, compliance with environmental regulations, treatment of animals, natural resource conservation, and everything related to climate change and sustainability to evaluate its environmental and climate risks. Investors may see these risks as too far away in the future or too vague and rare to consider them as relevant to evaluate a company's present value. Now, the order of magnitude is that one standard deviation in the significant Social, Governance, and ESG variables are respectively linked with a decrease in underpricing of 0.145, 0.136, and 0.150 standard deviations. Thus, for non-tech companies, the order changes from Table 3, with ESG, S, and G in order of importance.

There are some other differences when comparing all the non-tech companies to the whole sample. Negative loses its significance in models (47) and (48). Leverage and Lockup dummy remain like in Table 3, showing that mainly Tech companies' leverage and lockup period are negatively significant towards underpricing. Exchange dummy

loses its significance in model (45), (47), and (48) compared to modes (1), (3), and (4) of Table 3.

Table 15. ESG topics and IPO's quarter-end firm evaluation of Tech firms. The sample now includes 175 U.S. IPOs categorized by the SEC as part of the Technological sector. This table shows the results for a set of ordinary least squares regressions where the dependent variable is Tobin's Q. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Tobin's Q is the natural logarithm of the IPO's quarter-end total assets plus the market value minus the common equity, divided by the total assets, Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(49)	(50)	(51)	(52)
	Tobin's Q	Tobin's Q	Tobin's Q	Tobin's Q
Environmental	-0.532** (-2.500)			
Social		-0.875* (-1.706)		
Governance			-2.125*** (-3.757)	
ESG				-1.898*** (-3.354)
First-day returns	0.836*** (3.299)	0.888*** (3.490)	0.767*** (3.086)	0.804*** (3.217)
Price revision	1.177*** (3.242)	1.267*** (3.488)	1.141*** (3.242)	1.122*** (3.143)
Shares overhanging	0.037** (1.987)	0.045** (2.329)	0.048** (2.600)	0.047** (2.522)
Days between announcement and trading	-0.399*** (-2.677)	-0.440*** (-2.948)	-0.370** (-2.562)	-0.369** (-2.516)
Firm age	-0.467*** (-2.820)	-0.517*** (-3.136)	-0.455*** (-2.842)	-0.450*** (-2.770)
Proceeds	0.059 (0.531)	0.070 (0.607)	0.162 (1.426)	0.148 (1.285)
Leverage	-0.010 (-0.086)	-0.002 (-0.018)	0.020 (0.173)	0.024 (0.206)
Negative	32.770* (1.799)	32.818* (1.772)	32.163* (1.815)	34.084* (1.901)
Lockup dummy	0.407 (0.713)	0.436 (0.757)	0.255 (0.455)	0.305 (0.541)
Exchange dummy	0.118 (1.317)	0.152* (1.690)	0.151* (1.740)	0.143 (1.632)
Primary dummy	-0.213 (-1.333)	-0.234 (-1.436)	-0.253 (-1.612)	-0.252 (-1.592)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	175	175	175	175
Adjusted R-squared	0.464	0.452	0.489	0.480

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 16. ESG topics and IPO's quarter-end firm evaluation of non-Tech firms. The sample now includes 608 U.S. IPOs not categorized by the SEC as part of the Technological sector. This table shows the results for a set of ordinary least squares regressions where the dependent variable is Tobin's Q. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Tobin's Q is the natural logarithm of the IPO's quarter-end total assets plus the market value minus the common equity, divided by the total assets, Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative

number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(53)	(54)	(55)	(56)
	Tobin's Q	Tobin's Q	Tobin's Q	Tobin's Q
Environmental	-0.517*** (-5.295)			
Social		-0.156 (-0.652)		
Governance			-0.937*** (3.161)	
ESG				-0.985*** (-3.623)
First-day returns	0.966*** (7.681)	0.993*** (7.647)	0.949*** (7.378)	0.934*** (7.267)
Price revision	0.692*** (3.490)	0.801*** (3.971)	0.759*** (3.786)	0.751*** (3.754)
Shares overhanging	0.008** (2.132)	0.008* (1.909)	0.010** (2.478)	0.010** (2.460)
Days between announcement and trading	-0.118* (-1.657)	-0.142* (-1.941)	-0.146** (-2.013)	-0.143** (-1.983)
Firm age	-0.222*** (-3.595)	-0.220*** (-3.466)	-0.198*** (-3.122)	-0.206*** (-3.285)
Proceeds	-0.052 (-0.728)	-0.143* (-1.883)	-0.048 (-0.605)	-0.031 (-0.394)
Leverage	0.006 (0.626)	0.010 (1.066)	0.009 (1.004)	0.008 (0.863)
Negative	17.949** (2.274)	25.830*** (2.900)	28.705*** (3.531)	30.252*** (3.709)
Lockup dummy	0.205 (0.704)	0.237 (0.795)	0.211 (0.713)	0.216 (0.734)
Exchange dummy	0.138** (2.189)	0.167** (2.587)	0.177*** (2.773)	0.174*** (2.738)
Primary dummy	-0.021 (-0.332)	-0.021 (-0.327)	-0.025 (-0.399)	-0.030 (-0.476)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	608	608	608	608
Adjusted R-squared	0.340	0.309	0.320	0.323

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 15 and 16 use Tobin's Q as the dependent variables instead of Industry-adjusted Tobin's Q because it would make no sense to use an industry-adjusted variable when the dataset is divided into Tech and non-Tech.

Table 15 shows ordinary least-squares linear regression models using Tobin's Q as a dependent variable, but having only Tech companies in the sample.

Differently from Table 5, which had the whole sample of companies, the Environmental variable lowers a bit its p, becoming even more significant, while the Social variable increases a lot its p, remaining significant. Now, the order of magnitude is that one standard deviation in the significant Environmental, Social, Governance, and ESG variables are respectively linked with a decrease in underpricing of 0.162, 0.117, 0.258, and 0.235 standard deviations. Thus, for tech firms, the order changes from Table 3, with G, ESG, E, and S in order of importance.

There are quite a few other differences when comparing only Tech companies to the whole sample. Days between announcement and trading becomes negatively significant in all the models. Proceeds is not significant in any model. Negative interestingly earns a slight positive significance in all the models. Exchange dummy loses its significance in model (52), compared with model (12) of Table 5. All the rest changes slightly.

Table 16 shows ordinary least-squares linear regression models using Tobin's Q as a dependent variable, but having all the sample companies, except the Tech ones.

Differently from Table 5, which had the whole sample of companies, the Social variable loses its significance. This result may mean that the Social disclosures are essential mainly for the Tech companies if they want to receive a more precise evaluation, but not for the others. Social topics may be considered at a lower level of importance for non-tech companies if compared, for example, with the Governance ones, specific for public companies to reassure investors that there will be no agency conflicts. Now, the order of magnitude is that one standard deviation in the significant Environmental, Governance, and ESG variables are respectively linked with a decrease in underpricing of 0.199, 0.131, and 0.151 standard deviations. Thus, for non-tech companies, the order changes from Table 3, with E, ESG, and G in order of importance.

There are some other differences when comparing all the non-tech companies to the whole sample. Days between announcement and trading becomes negatively significant in all the models. Proceeds loses its positive significance in model (55), compared to model (11) of Table 5, but becomes negatively significant in model (54). Negative interestingly earns a high positive significance in all the models. Exchange dummy earns its significance also in model (53), compared with model (9) of Table 5, also the other models get a lower p, and thus become even more significant.

Table 17. ESG topics and IPO's underpricing of 2012-2015 firms' listings. The sample now includes 446 U.S. IPOs that happened between 2012 and 2015. This table shows the results for a set of ordinary least squares regressions where the dependent variable is First-day returns. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Environmental, Social, Governance are the logarithm of the number of words within the

S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(57)	(58)	(59)	(60)
	First-day returns	First-day returns	First-day returns	First-day returns
Environmental	-0.046 (-1.197)			
Social		-0.332*** (-3.660)		
Governance			-0.416*** (-3.714)	
ESG				-0.401*** (-3.825)
Price revision	0.695*** (10.624)	0.678*** (10.537)	0.669*** (10.339)	0.666*** (10.303)
Shares overhanging	0.008*** (3.068)	0.009*** (3.584)	0.010*** (3.802)	0.009*** (3.642)
Days between announcement and trading	-0.023 (-0.857)	-0.025 (-0.925)	-0.023 (-0.847)	-0.022 (-0.838)
Firm age	0.005 (0.177)	0.011 (0.426)	0.017 (0.626)	0.013 (0.482)
Proceeds	-0.034 (-1.214)	-0.014 (-0.513)	-0.002 (-0.085)	0.001 (0.034)
Leverage	-0.008 (-1.439)	-0.007 (-1.408)	-0.007 (-1.313)	-0.007 (-1.399)
Negative	2.549 (0.811)	7.252** (2.226)	4.544 (1.475)	4.823 (1.563)
Lockup dummy	0.045 (0.521)	0.042 (0.495)	0.028 (0.333)	0.033 (0.392)
Exchange dummy	0.044** (2.064)	0.049** (2.352)	0.049** (2.341)	0.047** (2.255)
Primary dummy	-0.176*** (-7.608)	-0.181*** (-7.974)	-0.178*** (-7.830)	-0.177*** (-7.827)
Tech dummy	-0.009 (-0.370)	-0.001 (-3.660)	0.000 (0.018)	-0.010 (-0.440)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	446	446	446	446
Adjusted R-squared	0.352	0.369	0.370	0.371

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 18. ESG topics and IPO's underpricing of 2016-2019 firms' listings. The sample now includes 337 U.S. IPOs that happened between 2016 and the end of June 2019. This table shows the results for a set of ordinary least squares regressions where the dependent variable is First-day returns. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words

within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(61)	(62)	(63)	(64)
	First-day returns	First-day returns	First-day returns	First-day returns
Environmental	-0.074* (-1.756)			
Social		-0.180* (-1.824)		
Governance			-0.311** (-2.588)	
ESG				-0.274** (-2.491)
Price revision	0.598*** (7.102)	0.614*** (7.446)	0.591*** (7.126)	0.589*** (7.065)
Shares overhanging	-0.001 (-0.737)	-0.001 (-0.623)	-0.001 (-0.377)	-0.001 (-0.449)
Days between announcement and trading	0.054 (1.648)	0.050 (1.524)	0.051 (1.569)	0.052 (1.600)
Firm age	-0.029 (-1.115)	-0.027 (-1.032)	-0.023 (-0.867)	-0.025 (-0.964)
Proceeds	0.006 (0.227)	0.018 (0.603)	0.032 (1.059)	0.029 (0.970)
Leverage	0.001 (0.167)	0.001 (0.208)	0.001 (0.186)	0.000 (0.101)
Negative	2.647 (0.780)	5.700 (1.515)	4.780 (1.379)	5.037 (1.438)
Exchange dummy	0.018 (0.679)	0.031 (1.163)	0.029 (1.093)	0.028 (1.047)
Primary dummy	-0.216*** (-8.308)	-0.212*** (-8.167)	-0.212*** (-8.243)	-0.215*** (-8.324)
Tech dummy	0.068** (2.402)	0.079*** (2.983)	0.084*** (3.199)	0.075*** (2.798)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	337	337	337	337
Adjusted R-squared	0.386	0.386	0.392	0.391

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 17 shows ordinary least-squares linear regression models using First-day returns as a dependent variable, but having only firms from 2012-2015.

Differently from Table 3, which had the whole sample of companies, the Environmental variable loses its significance. This result may be due to the sample diminishing in size, thus some significances disappear. Now, the order of magnitude is that one standard deviation in the significant Social, Governance, and ESG variables are respectively linked with a decrease in underpricing of 0.156, 0.161, and 0.167 standard deviations. Thus, for 2012-2015 companies, the order changes from Table 3, with ESG, G, and S in order of importance.

There are quite a few other differences when comparing only 2012-2015 companies to the whole sample. Shares overhanging becomes finally positive and significant in all the models like Bradley and Jordan show (2002). Negative loses its significance in models

(59) and (60) compared to models (3) and (4) of Table 3. Tech dummy is never significant. All the rest changes slightly.

Table 18 shows ordinary least-squares linear regression models using First-day returns as a dependent variable, but having only firms from 2016-2019.

As in Table 3, all the ESG variables are negatively significant but, if compared to Table 17, Environmental earns significance, while Social, Governance, and ESG remain significant but with a higher p. Now, the order of magnitude is that one standard deviation in the significant Environmental, Social, Governance, and ESG variables are respectively linked with a decrease in underpricing of 0.090, 0.098, 0.134, and 0.130 standard deviations. Thus, for 2016-2019 companies, the order changes from Table 3, with G, ESG, S, and E in order of importance

There are some other differences when comparing only the 2016-2019 companies to the whole sample. Negative and Exchange dummy lose their significance. Tech dummy earns instead positive significance in models (61) and (64), compared to the models (1) and (4) of Table 3.

Table 19. ESG topics and IPO's quarter-end firm evaluation of 2012-2015 firms' listings. The sample now includes 446 U.S. IPOs that happened between 2012 and 2015. This table shows the results for a set of ordinary least squares regressions where the dependent variable is Industry-adjusted Tobin's Q. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words

within the S-1 that are classified as being E, S, or G using our list. All the other variables' descriptions are the same as in the other Tables.

	(65)	(66)	(67)	(68)
	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q
Environmental	-0.109*** (-3.354)			
Social		-0.297*** (-3.443)		
Governance			-0.480*** (-4.552)	
ESG				-0.463*** (-4.746)
First-day returns	0.320*** (7.183)	0.301*** (6.674)	0.292*** (6.539)	0.290*** (6.495)
Price revision	0.213*** (3.139)	0.232*** (3.443)	0.220*** (3.293)	0.217*** (3.246)
Shares overhanging	-0.002 (-0.985)	0.000 (-0.183)	0.001 (0.284)	0.000 (-0.036)
Days between announcement and trading	-0.081*** (-3.210)	-0.085*** (-3.403)	-0.083*** (-3.345)	-0.083*** (-3.337)
Firm age	-0.049** (-2.009)	-0.050** (-2.069)	-0.042* (-1.734)	-0.044* (-1.840)
Proceeds	-0.006 (-0.239)	-0.003 (-0.115)	0.018 (0.665)	0.022 (0.817)
Leverage	0.005 (1.084)	0.006 (1.174)	0.006 (1.289)	0.006 (1.193)
Negative	-0.568 (-0.196)	4.525 (1.475)	2.494 (0.871)	2.851 (0.994)
Lockup dummy	0.123 (1.550)	0.126 (1.587)	0.110 (1.389)	0.115 (1.458)
Exchange dummy	0.034* (1.767)	0.037* (1.935)	0.038** (2.002)	0.038** (2.029)
Primary dummy	-0.017 (-0.735)	-0.030 (-1.335)	-0.029 (-1.281)	-0.028 (-1.249)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	446	446	446	446
Adjusted R-squared	0.307	0.308	0.322	0.324

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 20. ESG topics and IPO's quarter-end firm evaluation of 2016-(end of June)2019 firms' listings. The sample now includes 337 U.S. IPOs that happened between 2016 and the end of June 2019. This table shows the results for a set of ordinary least squares regressions where the dependent variable is Industry-adjusted Tobin's Q. The independent variables are the ESG proxies and the standard controls, the Loughran and McDonald (2011) Negative sentiment and year fixed effects. Environmental, Social, Governance are the logarithm of the number of words within the S-1 that are classified respectively as E, S, G using our list, ESG is the logarithm of the cumulative number of words within the S-1 that are classified as being E, S, or G using our list. All the other variables'

descriptions are the same as in the other Tables. The Lockup dummy is missing because in this sample every company has a lockup period.

	(69)	(70)	(71)	(72)
	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q	Industry-adjusted Tobin's Q
Environmental	0.015 (0.245)			
Social		-0.165 (-1.099)		
Governance			-0.655*** (-3.581)	
ESG				-0.349** (-2.087)
First-day returns	0.263*** (3.118)	0.248*** (2.957)	0.216** (2.605)	0.231*** (2.744)
Price revision	0.356** (2.574)	0.339** (2.486)	0.291** (2.159)	0.309** (2.260)
Shares overhanging	0.003 (1.601)	0.004* (1.719)	0.005** (2.245)	0.004* (1.894)
Days between announcement and trading	0.022 (0.438)	0.028 (0.559)	0.033 (0.687)	0.034 (0.683)
Firm age	-0.119*** (-2.990)	-0.118*** (-2.958)	-0.107*** (-2.723)	-0.115*** (-2.908)
Proceeds	-0.001 (-0.020)	0.021 (0.481)	0.078* (1.724)	0.043 (0.958)
Leverage	0.004 (0.694)	0.003 (0.554)	0.002 (0.386)	0.002 (0.424)
Negative	-3.292 (-0.642)	-0.334 (-0.058)	1.309 (0.253)	0.096 (0.018)
Exchange dummy	0.033 (0.812)	0.039 (0.958)	0.044 (1.102)	0.038 (0.941)
Primary dummy	-0.012 (0.284)	-0.015 (-0.352)	-0.024 (-0.558)	-0.023 (-0.518)
Year dummies	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	337	337	337	337
Adjusted R-squared	0.113	0.116	0.147	0.124

t statistics in parentheses

* p < 0.100.

** p < 0.050.

*** p < 0.010.

Table 19 shows ordinary least-squares linear regression models using Industry-adjusted Tobin's Q as a dependent variable, but having only firms from 2012-2015.

Differently from Table 5, which had the whole sample of companies, the Environmental variable increases its significance, getting a lower p. Now, the order of magnitude is that one standard deviation in the significant Environmental, Social, Governance, and ESG variables are respectively linked with a decrease in underpricing of 0.146, 0.156, 0.208, and 0.215 standard deviations. Thus, for 2012-2015 companies, the order changes from Table 5, with ESG, G, S, and E in order of importance.

There are quite a few other differences when comparing only 2012-2015 companies to the whole sample. Shares overhanging loses its significance in all the models. Days between announcement and trading becomes negatively significant in all the models. Proceeds loses its significance in model (67), compared to model (11) of Table 5. Exchange dummy gains positive significance in model (65), compared to model (9) of Table 5. All the rest changes slightly.

Table 20 shows ordinary least-squares linear regression models using Industry-adjusted Tobin's Q as a dependent variable, but having only firms from 2016-2019.

Differently from Table 5, Environmental and Social are non-significant. Such a thing could be because the sample diminishes in size, thus some significances disappear. Now, the order of magnitude is that one standard deviation in the significant Governance and ESG variables are respectively linked with a decrease in underpricing of 0.222 and 0.130 standard deviations. Thus, for 2016-2019 companies, the order changes from Table 3, with G and ESG in order of importance.

There are some other differences when comparing only the 2016-(end of June)2019 companies to the whole sample. Shares overhanging loses its significance in model (69), compared to model (9) of Table 5. Exchange dummy loses its significance in all the models.

6. Conclusion and discussions

We investigate three different dimensions related to the pricing of the IPOs: the underpricing, the price revision, and the IPO evaluation. We build our models basing on the idea that information frictions may be what causes most underpricing (Ljungqvist 2007). In the IPO process, the companies deliver a large amount of information to the public through different obligatory releases. Thus, we focus on the information contained in the S-1 prospectuses, since they are read mostly by institutional investors, of which investment decisions contribute to determine the level of underpricing and influence the investment community decisions. More and more investors use the ESG criteria to evaluate investment opportunities and IPOs, also because they might want to avoid investing in companies associated with insufficient and inefficient environmental, social, and governance practices. Following Friede, Bush and Bassen (2015) most research found a positive ESG-CFP relation. Therefore, we claim a significant relationship exists between ESG communication and IPOs pricing and evaluation.

Therefore, we expect, *ceteris paribus*, a negative relation between the amount of ESG disclosures in the S-1 forms and the underpricing. The reasons at the base of this process has to do with the fact that disclosing information diminishes the information asymmetry and because ESG disclosures usually bring positive benefits to the

companies' financial performance. Thus, the correlation with underpricing should be negative, since increasing the offer price by construction reduces the underpricing. Furthermore, we predicted that the most negative relationship with underpricing, in order of economic magnitude, should be found with the Governance topic, second the Environmental one, third the Social one, and last with the ESG variable as a whole.

Another interesting finding we look for is the proof of a negative association between the amount of ESG disclosure in the S-1 and the firm evaluation. That is again because disclosing information diminishes the information asymmetry. Thus, the company's evaluation should be more precise. We expect the most negative relationship with firm evaluation should be found, in order of magnitude, with the Governance disclosure, then with the Environmental, then with the Social, and last with the ESG disclosure as a whole

To shed light on this issue, we analyze 791 U.S. IPOs from 2012-2019 and use textual analysis to compute the number of ESG words present in each of the 791 pre-IPO S-1 forms. The findings document that the amount of ESG disclosures in the S-1 forms is associated negatively with first-day returns and firm evaluation, confirming the hypotheses. This effect is highly significant and economically meaningful, as one standard deviation in the Environmental, Social, Governance, and ESG variables lead respectively to a decrease in the IPO's underpricing of 0.073, 0.141, 0.148, and 0.156 standard deviations, and in the Tobin's Q of 0.058, 0.116, 0.217, and 0.174 standard deviations. Thus, we find the 2) and 4) hypotheses not to be confirmed. ESG as a whole has the highest economic effect, with Governance, Social, and then Environmental following in order for the IPO's underpricing. For the firms' Tobin's Q, Governance has the highest economic effect, with ESG, Social, and then Environmental following in order.

These results contribute to the other researchers' results that the disclosure of ESG information and the closing of the information asymmetry gap lead to higher corporate financial performance, here in terms of lower underpricing and more precise firm evaluation.

We check our finding applying a number of robustness checks, either by controlling for different variables specification or including different data items. We control whether

using different constant variables, such as Positive and Uncertainty sentiments instead of Negative, changes the results. This effect does not happen. We also change the E, S, G, and ESG variables to be the percentage of the number of such words in the S-1 form. In that case, all the ESG variables lose their significance for the underpricing and firm evaluation.

We then control to see if the effect we found has been driven by specific sub-samples, for instance dividing the dataset in Tech and non-Tech companies (as categorized by the SEC). The analysis confirms our finding but, due to the small dimension of one of the subset (only 175 IPOs in our sample are Tech IPOs), only the non-tech subsample reported significant results.

We also consider the time dimension, since sustainability has become more and more popular over the last few years. In order to do so, we divide the sample based on the year the IPOs happened: from 2012 to 2015, and from 2016 to 2019. When splitting in the two subsamples, we may observe that the effect of Environmental remains significant only in the 2012-2015 sample for the firm evaluation, and in the 2016-2019 sample for the underpricing. Social remains significant in all the samples for the underpricing, and only in the 2012-2015 one for the firm evaluation. Governance and ESG remain always significant.

Overall, this paper's results lead to a broadening of the current theory on underpricing and firm evaluation, particularly on the effects of ESG disclosures on companies' financial performance, filling the research void between ESG and IPO's pricing and evaluation. As Loughran and McDonald (2013) did for the sentiment variables regarding the underpricing, the hope is that our work will lead the ESG disclosures to enter into the list of common control variables used to predict underpricing and to evaluate a firm more precisely.

This is one of the first papers trying to appreciate the ESG disclosure applying ESG textual analysis to IPO disclosure. The results could be strengthened by increasing the considered time-span, by assigning positive or negative sentiment specifically related to the ESG topics or by considering an international IPOs sample. We claim to have found a first, robust, association with ESG disclosure during IPO and the IPO underpricing and evaluation.

APPENDIX A: S-1 examples

Environmental disclosure

Nexa Resources S.A. Form F-1

By Nexa Resources S.A.

September 21, 2017 – EDGAR Filing Detail

Our success depends on our ability to meet a range of environmental and social challenges. [...] Accordingly, we seek to adopt and implement environmental and social policies to mitigate these risks and help distinguish us from other participants in the industry.

Waste Management

In 2016, our operations generated more than 16 million tonnes of waste, of which 10.3 million tonnes are classified as hazardous (9.8 million tonnes of mining waste and 0.53 million tonnes of smelting waste). The target for 2025 is to reduce the specific generation of waste from mining and metal production by 50.0%. We have already implemented several initiatives, such as agricultural limestone production and sale in our Morro Agudo mine and a lead-silver project in Vazante mine, where we introduced a new flotation cell to recover lead-silver. This will result in a decrease in the consumption of natural resources and costs as well as the lower level of environmental impacts associated with the disposal of such waste. The main risks involved relate to the storage of waste. To mitigate these risks, we use three waste disposal methods:

-tailings dams;

-dry stack tailings; and

-back fill, in which the waste is returned to the mine.

In some cases, our operations can combine these waste disposal methods. [...]

In addition, Brazilian Exame Magazine's Sustainability Guide—2016 edition highlighted VMH's development of actions focusing on waste and dam management.

The back-fill system has been adopted at the Atacocha, Cerro Lindo and El Porvenir units in Peru. Pursuant to this system, 38.0% of the waste is returned to the mines, reducing the need for tailings dams or dry stack tailings facilities. [...] All waste is filtered in order to separate the water and the solids. Water is recirculated, and the waste is dry stacked. Both back fill and dry stack methods, due to their smaller environmental footprint, are being studied in our Aripuanã and Caçapava do Sul greenfield projects. In addition, our Morro Agudo mine is a successful example of zero waste generation. The type of mineralization mined at the unit—referred to as “surrounding rock”—is used to produce zinc as the primary metal product and lead and agricultural lime as byproducts. [...] We also have processes in place at our Vazante, Juiz de Fora and Três Marias units to reduce and utilize or sell the waste generated.

Social disclosure

ADT Inc. Form S-1

By ADT Inc.

December 21, 2017 – EDGAR Filing Detail

We rely on a significant number of our customers remaining with us as customers for long periods of time.

We operate our business with the goal of retaining customers for long periods of time in order to recoup our initial investment in new customers, and we generally achieve cash flow break-even in less than three years. Accordingly, our long-term

profitability is dependent on long **customer** tenure. This requires that we minimize our rate of **customer** disconnects, or attrition. One reason for disconnects is when **customers** relocate and do not reconnect. **Customer** relocations are impacted by changes in the housing market. See “—General economic conditions can affect our business, and we are susceptible to changes in the business economy, housing market, and business and **consumer** discretionary income, which may inhibit our ability to sustain **customer** base growth rates and impact our results of operations.” Other factors that can increase disconnects include **problems** experienced with our product or service quality, **customer** service, **customer** non-pay, unfavorable general economic conditions, and the preference for lower pricing of competitors’ products and services over ours. If we fail to keep our **customers** for a sufficiently long period of time, our profitability, business, financial condition, results of operations and cash flows could be materially adversely affected. [...]

Our **reputation** as a service provider of high quality security offerings may be materially adversely affected by **product defects** or shortfalls in **customer** service. Our business depends on our **reputation** and ability to maintain good **relationships** with our subscribers, dealers and local **regulators**, among others. Our **reputation** may be harmed either through **product defects**, such as the failure of one or more of our subscribers’ alarm systems, or shortfalls in **customer** service. Subscribers generally judge our performance through their interactions with the staff at the monitoring and **customer** care centers, dealers, and technicians who perform on-site maintenance services. Any failure to meet subscribers’ expectations in such **customer** service areas could cause an increase in attrition rates or make it difficult to recruit new subscribers. Any harm to our **reputation** or subscriber **relationships** caused by the actions of our dealers, **personnel**, or third-party service providers or any other factors could have a material adverse effect on our business, financial condition, and results of operations. [...]

We have and will continue to invest in new businesses, services, and technologies outside the traditional security and interactive services market, which is inherently risky, and could **disrupt** our current operations. [...]

Our investments may involve significant risks and uncertainties, including capital loss on some or all of our investments, insufficient revenues from such investments to offset any new **liabilities** assumed and expenses associated with these new investments, distraction of management from current operations, and issues not identified during pre-investment planning and due diligence that could cause us to fail to realize the **anticipated** benefits of such investments and incur **unanticipated liabilities**. Since these investments are inherently risky, these new businesses, products, services, and technologies may not be successful and as a result, may materially adversely affect our **reputation**, financial condition, and results of operations. [...]

There are inherent costs and risks associated with replacing and changing these systems and implementing new systems, including potential **disruption** of our sales, operations and **customer** service functions, potential **disruption** of our internal control structure, substantial capital expenditures, additional administration and operating expenses, retention of sufficiently **skilled personnel** to implement and operate the new systems, demands on management time, and other risks and costs of delays or difficulties in transitioning to new systems or of integrating new systems into our current systems. [...] The implementation of new information technology systems may also cause **disruptions** in our business operations and have a material adverse effect on our business, cash flows, and results of operations. [...]

If we are unable to recruit and retain key **personnel**, including an effective sales force, our ability to manage our business could be materially and adversely

affected.

Our success will depend in part upon the continued services of our **management team** and sales **representatives**. Our ability to recruit and retain key **personnel** for management positions and effective sales **representatives** could be impacted adversely by the competitive environment for management and sales **talent**. The loss, incapacity, or unavailability for any reason of key members of our **management team** and the inability or delay in hiring new key **employees**, including sales force **personnel**, could materially adversely affect our ability to manage our business and our future operational and financial results.

The loss of our senior management could **disrupt** our business.

Our senior management is important to the success of our business because there is significant competition for executive **personnel** with experience in the security and home automation industry. [...] The loss of any member of our senior **management team** without retaining a suitable replacement (either from inside or outside our existing **management team**) could have a material adverse effect on our business, financial condition, and results of operations.

Adverse developments in our **relationship** with our **employees** could materially and adversely affect our business, results of operations, and financial condition.

As of September 30, 2017, approximately 1,700 of our **employees** at various sites, or approximately 10% of our total **workforce**, were represented by **unions** and covered by collective bargaining agreements. [...] We cannot predict the outcome of negotiations of the collective bargaining agreements covering our **employees**. If we are unable to reach new agreements or renew existing agreements, **employees** subject to collective bargaining agreements may **engage in strikes**, work slowdowns, or other **labor actions**, which could materially **disrupt** our ability to provide services. New **labor agreements** or the renewal of existing agreements may impose significant new costs on us, which could materially adversely affect our financial condition and results of operations in the future.

Governance disclosure

Sabre Corp Form S-1

By Sabre Corp.

January 21, 2014 – EDGAR Filing Detail

After the completion of this offering, the Principal Stockholders will **control** a majority of our outstanding common stock. [...] Under the rules, a company of which more than 50% of the **voting** power is held by an individual, group or another company is a “controlled company” and may elect not to **comply** with certain corporate **governance** standards, including: the requirement that a majority of the board of **directors** consist of independent **directors**; the requirement that we have a nominating and corporate **governance** committee that is composed entirely of independent **directors** with a written charter addressing the committee’s purpose and responsibilities; the requirement that we have a **compensation** committee that is composed entirely of independent **directors** with a written charter addressing the committee’s purpose and responsibilities; and the requirement for an annual performance evaluation of the nominating and corporate **governance** and **compensation** committees. [...] As a result, we may not have a majority of independent **directors**, our nominating and corporate **governance** committee and **compensation** committee may not consist entirely of independent **directors** and such committees may not be subject to annual performance evaluations. Accordingly, you may not have the same protections afforded to stockholders of companies that are subject to all of the rules regarding corporate **governance**.

The “controlled company” exception does not modify the independence

requirements for the **audit** committee, and we intend to **comply** with the **audit** committee requirements of Rule 10A-3 under the Exchange Act and the rules. Pursuant to such rules, we are required to have at least one independent **director** on our **audit** committee during the 90-day period beginning on the date of **effectiveness** of the registration statement filed with the SEC in connection with this offering. After such 90-day period and until one year from the date of **effectiveness** of the registration statement, we are required to have a majority of independent **directors** on our **audit** committee. Thereafter, our **audit** committee is required to be comprised entirely of independent **directors**.

Board **Composition**

Our business and affairs are managed under the direction of our board of **directors**. Our amended and restated certificate of incorporation will provides that our board of **directors** shall consist of at least **directors** but no more than **directors**. Our board of **directors** is currently comprised of 8 **directors**. Our amended and restated bylaws will provide that our board of **directors** will be fixed from time to time by resolution adopted by the affirmative **vote** of a majority of the total **directors** then in office. Our board of **directors** has determined that , and are independent as defined under the corporate **governance** rules of the .

Our board of **directors** is divided into classes, with each **director** serving a - year term and one class being elected at each year's annual meeting of stockholders.

serve as Class I **directors** with an initial term expiring in 20 .
serve as Class II **directors** with an initial term expiring in 20 .
serve as Class III **directors** with an initial term expiring in 20 .

. Upon the expiration of the initial term of office for each class of **directors**, each **director** in such class shall be elected for a term of years and serve until a successor is duly elected and qualified or until his or her earlier death, resignation or removal. Any additional directorships resulting from an increase in the number of **directors** or a vacancy may be filled by the **directors** then in office.

Committees of the Board of **Directors**

Upon completion of this offering, we will establish the following committees of our board of **directors**.

Audit Committee

The **audit** committee:

- reviews the **audit** plans and findings of our independent registered public accounting firm and our internal **audit** and risk review staff, as well as the results of **regulatory** examinations, and **tracks management's** corrective action plans where necessary;

- reviews our financial statements, including any significant financial items and/or changes in accounting **policies**, with our senior **management** and independent registered public accounting firm;

- reviews our financial risk and **control procedures**, **compliance** programs and significant **tax**, **legal** and **regulatory** matters; and

- has the sole discretion to appoint annually our independent registered public accounting firm, evaluate its independence and performance and set clear hiring **policies** for **employees** or former **employees** of the independent registered public accounting firm.

The members of the **audit** committee are (Chair), and

. Upon **effectiveness** of the registration statement, members of the committee will be "independent," as defined under the rules of the rules and Rule 10A-3 of the Exchange Act. Our board of **directors** has determined that each **director** appointed to the **audit** committee is financially literate, and the board has determined that is our **audit** committee financial expert.

Our board of **directors** has adopted a written charter for our **audit** committee,

which will be available on our corporate website at www.sabre.com upon the closing of this offering.

Nominating and Corporate Governance Committee

The nominating and corporate governance committee:

- reviews the performance of our board of directors and makes recommendations to the board regarding the selection of candidates, qualification and competency requirements for service on the board and the suitability of proposed nominees as directors;

- advises the board with respect to the corporate governance principles applicable to us;

- oversees the evaluation of the board and management;

- reviews and approves in advance any related party transaction, other than those that are pre-approved pursuant to pre-approval guidelines or rules established by the committee; and [...]

The members of the nominating and corporate governance committee are (chair), and . Because we will be a “controlled company” under the rules, our nominating and corporate governance committee is not required to be fully independent, although if such rules change in the future or we no longer meet the definition of a controlled company under the current rules, we will adjust the composition of the nominating and corporate committees accordingly in order to comply with such rules.

Our board of directors has adopted a written charter for our nominating and corporate governance committee, which will be available on our corporate website at www.sabre.com upon the closing of this offering.

Compensation Committee

The compensation committee:

- reviews and recommends to the board the salaries, benefits and equity incentive grants for all employees, consultants, officers, directors and other individuals we compensate;

- reviews and approves corporate goals and objectives relevant to the compensation of our executive officers, evaluates the performance of our executive officers in light of those goals and objectives, and determines the compensation of our executive officers based on that evaluation; and

- oversees our compensation and employee benefit plans.

The members of the compensation committee are (chair), and . Because we will be a “controlled company” under the listing rules, our compensation committee is not required to be fully independent, although if such rules change in the future or we no longer meet the definition of a controlled company under the current rules, we will adjust the composition of the nominating and corporate committees accordingly in order to comply with such rules.

Our board of directors has adopted a written charter for our compensation committee, which will be available on our corporate website at www.sabre.com upon the closing of this offering.

Compensation Committee Interlocks and Insider Participation

None of our executive officers currently serves, or in the past year has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers serving on our board of directors or compensation committee.

APPENDIX B: list of ESG words

E list of words

accountability institute; acute risk; adverse weather; agribusiness; agricultural; agriculture; air; air quality; animal; arctic drilling; ash; biodiverse; biodiversity; biological; biology; calamitous; carbon; catastrophe; catastroph; celsius; climate; co2; coal; coal-based; coffee; commodity; construction; contamination; damage; death; degradation; degree; depletion; diversity; drought; e risk; earth; earthquake; eco; ecological; electric; emission; environment; erosion; esg; explosion; fahrenheit; fatality; fine; fire; flood; food; forest; fuel; geographic; grape; green; greenhouse; health; heat; hurricane; hybrid; hydrocarbon; imported energy; jungle; land use; leakage; loss of export; mark carney; material; medical spending; mine; mining; morbidity; mortality; natural; nature; ocean; organism; ph; physical; pollute; pollution; rain; rainforest; recycle; renewable; resilience; resilient; resource; scarce; scarcity; sea level; sewer; sids; soil; stern review; stewardship; storm; sun; surge; sustainable; sustainability; task force on climate; tcfd; temperature; timber; toxic; transition risk; typhoon; underwriting loss; utility; vulnerable 20; warm up; waste; water; weather; wildfire; wind.

S list of words

absenteeism; abuse; abusive; acceptance criteria; accident; accountability; activism; adapt; adjust; affordability; affordable; age; aging; animal; anticipate; audience; aware; behavior; behaviour; bisphenol; bonus; boycott; brand name; buyer beware; caveat emptor; circular economy; civic organization; civil society; class action; client; cohesion; cohesiveness; combat; community; community-related; compensation; complaint; compliance; comply; conflict; consumer; controversy; corruption; credibility; credible; crime; cultural; culture; customer; damage; danger; death; deficiency; deficient; demographic; demography; demonstration; diplomacy; disclosure; dispute; disrupt; diverse; diversity; due diligence; economic development; education; effectiveness; employee; engage; enhanced business; ethical; ethnic minority; excessive; explosion; extra-financial; fatal; fight; fine; flexible; gender; geopolitic; global compact; gluten; gmo; hazard; health; healthcare; hospital; human capital; inclusion; income disparity; income distribution; indigenous; inequalities; infrastructure; innovation; insight; instability; institutional assessment; institutional profile; institutional quality; investigation; labor; labour; lawsuit; legal; lhi; liability; liabilities; license to operate; literacy; living standard; long horizon investment; management practice; management shortcoming; management team; middle class; migration; misconduct; mis-selling; misselling products; mission; money laundering; non-profit; non-traditional; not for profit; old; openness; operational performance; operational risks; order; oversight; pay-gap; pay gap; penalties; pension; personnel; philanthropy; policy; political; poor transparency; population; poverty; predictability; pressure;

privacy; procedure; product defect; product recalls; protest; prudential; public good; public opinion; public resources; public service; public transport; punish; qualification; quality of life; race; racial; regulation; regulator; relation; remuneration; representation; representative; reputable; reputation; responsible investment; restructuration; right; safety; sanction; satisfaction; scandal; school; self-sustaining; sign-up process; skill; social; societal priorities; socio-economic; sri; stability; staff turnover; stakeholder; standards of living; statutory; strategic; strategy; strike; stringent; substitution; suicide; supervision; sustainable; talent; taste; tax evasion; taxation; technological change; terror; top management; trend; tribal; tribe; union; united nations; unrest; urbanization; values; violation; violence; violent; vision; vulnerable clientele; war; welfare; workforce; working conditions; world bank group; young.

G list of words

abuse; abusive; accountability; accountable; accuracy; activism; adjust; aggressive; allegation; audit; authority; aware; background; bankruptcy; board independence; board inefficiency; board membership; board skill sets; board turnover; board-related factor; bonus; breach; breadth; brexit; budgetary flexibility; budgetary performance; budgetary pressure; business environment; business plan; cease-and-desist; ceo; combat; communicate; communication; community-related; compensation; compliance; comply; composition; comprehensive; conflict; control; controversy; corporate behaviour; corporate value; corruption; credibility; credible; culture; deficiencies; deficiency; deficient; diplomacy; director; disclosure; dissent; diverse skill; diversity; divestiture; duality; due diligence; effectiveness; efficiency of the board; electricity subsidy; employee; engagement; equator principles; erm; excessive; execution; executive; experience; expertise; extraordinary support; fine; fraud; geopolitical; governance; governing body; implementation support; independent board; independent institution; inefficiency; inefficient; information; infrastructure program; insight; instability; institutional assessment; institutional framework; institutional investor; institutional profile; institutional quality; investigation; irregularities; key institution; lawsuit; legal; liquidity risk; litigation; manage risk; management; managing risks; misconduct; mission; money laundering; monitoring; new focus; openness; operational goal; operational performance; operational risk; oversight; party; penalties; penalty; planning; policies; policy flexibility; policy framework; policy support; policymaking; political; political institution; practices; predictability; procedure; prudential; prudently mitigate; public opinion; punish; realistic budgeting; referendum; regulation; regulator; relation; reliability; remuneration; reporting; representation; reputable; reputation; responsible investment; restructuring; risk appetite; risk framework; robust; rule of law; ruling; sanction; scandal; shareholder initiative; societal priorities; stability; stakeholder; stewardship; strategic; strategies; strategy; structure; supervisory; tax; technical advice; tolerance; track; transparency; transparent; union; unrest; values; violation; vision; vote; voting.

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