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Quality revealing versus overstating in equity crowdfunding

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ABSTRACT

This paper studies the impact of qualitative business information on mitigating information asymmetry between equity crowdfunding entrepreneurs and investors. Qualitative business information covers the entrepreneurs' introduction on business model, competitive strategy, product market, drivers and barriers for product/service adoption and business milestones. Empirical data reveal that, overall, more detailed disclosure of qualitative business information leads to better fundraising outcome. However, while entrepreneurs' excessive use of promotional language, or self-praise on business quality without factual support, is not rewarded by sophisticated investors, ordinary investors are less resistant to promotional language. We also find that Title III of the JOBS Act results in a reduction of the percentage of completed fundraisings but exacerbates the effect of project description on the percentage of completed fundraisings.

1. Introduction

It is broadly documented in extant literature that information asymmetry in security offering increases the cost of raising capital (Vismara et al., 2012; Bonardo et al., 2016; Vismara, 2018; Hornuf and Schwienbacher, 2018; Signori and Vismara, 2018). Consequently, it is in firms' interest to voluntarily disclose information to the public (Korajczyk et al., 1991; Lang and Lundholm, 2000), even when the disclosures are viewed as only partially credible (Pownall and Waymire, 1989). In a broader context, voluntary disclosure increases the liquidity of equity markets (Diamond and Verrecchia, 1991; Welker, 1995), which has a significant impact on asset prices (Acharya and Pedersen, 2005).

Security offering does not have to take place in well-established exchanges, in which high listing requirements and expensive floatation costs turn down many young and small businesses. Instead, equity crowdfunding provides a new channel for entrepreneurs to raise money directly from a group of investors through online security offering. Transactions between entrepreneurs and investors often take place in an equity crowdfunding platform.

Contrary to traditional stock exchanges, equity crowdfunding platforms adopt much more flexible listing requirements and do not involve underwriters in administering security offering. Entrepreneurs post detailed information regarding firm, management, product market and financial records etc. on a crowdfunding platform; investors then evaluate the quality of a firm based on the information and decide whether to invest. Entrepreneurs do not disclose information through platforms after crowdfunding campaigns. However, they must report business conditions, financial records and crowdfunding results to the Securities and Exchange Commission (SEC). So far, platforms do not support a secondary market for equity crowdfunding investors.

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The flexible listing requirements and slack corporate disclosure policy make equity crowdfunding especially exposed to information asymmetry. Admittedly, inferior firms that cannot obtain investment from Angel Investors or Venture Capitalists may take advantage of the low listing requirements and choose equity crowdfunding as a last resort (Capizzi and Carluccio, 2016; Walthoff-Borm et al., 2018). This adverse selection problem reduces the overall quality of crowdfunding projects and is detrimental to investor confidence in the equity crowdfunding market.

As the value of crowdfunding firms is relatively stable during the fundraising process, the information asymmetry problem disappears when investors learn about quality (Bonini et al., 2018; Kirmani and Rao, 2000). The important questions are: what approaches do equity crowdfunding firms take to reveal quality to investors? What is effective quality signaling in the context of equity crowdfunding? Is the effectiveness of quality signaling related with sophistication of equity crowdfunding investors?

The answers to the research questions reside in the information entrepreneurs provided. In general, information about start-ups seeking crowdfunding can be divided into two parts: the quantitative business information and qualitative business information.

Quantitative business information includes financial statements in previous years, management educational background and years of relevant industry experience, number of employees, estimated product market size etc. Most quantitative information is costly to obtain: neither graduating from a top university or working as a director for a reputable firm is easy; achieving strong growth in sales and product popularity is also challenging for most start-ups; and more employees is often associated with increased human resource costs. The impact of costly signals in quality revealing has been extensively studied in extant literature (e.g., Bergh et al., 2014; Connelly et al., 2011; Pollock et al., 2010; Spence, 1973, 2002), with many papers examine costly signaling in the context of entrepreneurial financing (e.g., Davila et al., 2003; Kirsch et al., 2009; Ozmel et al., 2012; Ahlers et al., 2015). Empirical evidence suggest that investors react to costly information because it indicates higher firm quality (Connelly et al., 2011) and creates a separating mechanism between higher and lower quality firms (Bergh et al., 2014).

Qualitative business information includes entrepreneurs' introduction on business model, competitive strategy, product market, drivers and barriers for product/service adoption and business milestones. While quantitative business information is data driven and often directly verifiable, qualitative information reflects entrepreneurs' self-evaluation on the business and can be hardly verified. Contrary to the popularity of investigations on costly signaling, few studies have examined the impact of costless signaling, such as how language used in entrepreneurial narratives influences funding of new ventures (Martens et al., 2007) in the past, because signals such as founders' statements regarding their motivation or optimism to start a new venture are not costly to make and are easier for another founder or firm to imitate (Anglin et al., 2018).

The raising of crowdfunding motivates a revisit in signaling theory. Recent studies show that less costly signals can be important when objective information is scare (e.g., Lin et al., 2013), when there is lack of explicit behavioral norms (e.g., Danilov and Sliwka, 2017), and when audience is unsophisticated (e.g., Loewenstein et al., 2014). These three conditions suggest that less costly signals might be particularly valuable in crowdfunding contexts (Anglin et al., 2018). Accordingly, Allison et al. (2013); Allison et al. (2015) demonstrate that language used in microlending entrepreneurial narratives influences how quickly loans are funded; Anglin et al. (2018) find that entrepreneurs conveying positive psychological capital experience superior fundraising performance for reward-based crowdfunding; Parhankangas and Renko (2017) reveal that linguistic styles boost the success of social crowdfunding campaigns; and Pietraszkiewicz et al. (2017) argue that the inclusion of prosocial language contributes to success of crowdfunding. These novel studies unveil the important function costless signals exhibit in the context of donation, reward or not-for-profit lending crowdfunding. As equity crowdfunding involves security issuance, and is for profit in nature, it is fundamentally different from other types of crowdfunding, resulting in very different investor incentives and risk preferences. To date, whether and how costless qualitative business information facilitates the communication between equity crowdfunding entrepreneurs and investors has never been investigated.

In this paper, we use empirical evidence in the field of equity crowdfunding to demonstrate that, in addition to quantitative firm information, qualitative business descriptions also have a significant impact on equity crowdfunding outcomes. In particular, more detailed qualitative business introduction is associated with higher chance of funding success and larger amount of capital raised. However, excessive use of promotional language, measured by percentage of promotional words used in entrepreneurs' qualitative introduction on the business, negatively affects fundraising outcomes. We argue that the entrepreneurs' qualitative business introduction signals both unobservable firm quality and entrepreneurial credibility. We also show that, after the Title III of the JOBS Act, when less sophisticated investors entered the equity crowdfunding market, the impact of qualitative business information on fundraising outcome further strengthens.

This paper is also related to studies on equity crowdfunding mechanisms. In particular, retaining equity and providing more detailed information about risks are effective signals on corporate quality and have a strong impact on fundraising success (Ahlers et al., 2015); increasing goal size is negatively related with probability of fundraising success (Cumming and Johan, 2019); illustration videos facilitate fundraising while increased fundraising duration decreases the chances of crowdfunding success (Mollick, 2014).

Our study contributes to the existing literature in three aspects: first, it is the first paper disclosing equity crowdfunding investors' preferences in perceiving qualitative business information. Prior studies in the field investigate the impact of language expressions on fundraising outcomes in the context of online lending-based platforms (e.g., Allison et al., 2013) or reward-based platforms (e.g., Anglin et al., 2018). Equity crowdfunding is fundamentally different from other types of crowdfunding because it involves security issuance, crowdfunding investors are profit driven and investors seek long-term capital exit channels. How equity crowdfunding investors respond to qualitative business information is unknown. Second, it is the first paper formulating contextual analysis in the context of equity crowdfunding and providing a vocabulary list of typical promotional words used in the fundraising campaigns. Prior studies in the field use Diction Software (e.g., Allison et al., 2013; Anglin et al., 2018); however, there is evidence suggesting the

important limitation of Diction in analyzing business information (Loughran and Mcdonald, 2015). Other textual analyses focus on public firms (e.g., Loughran and Mcdonald, 2011; Bodnaruk et al., 2015), which are very different from early stage start-ups that seek equity crowdfunding. In this paper, we made significant updates to Loughran-McDonald Sentiment Word List (2018) to make it suitable in the equity crowdfunding context. Third, through examining crowdfunding investors' preferences, we offer strategic fundraising guidance to small businesses seeking equity crowdfunding.

2. Institutional background

Until recent years, equity crowdfunding was not available to small business entrepreneurs seeking external financing. As a new financing channel alternative to the traditional Angel and Venture Capital investment, equity crowdfunding provides small business entrepreneurs an opportunity to sell a specified amount of equity or bond-like shares to a pool of investors via an online platform (Ahlers et al., 2015). This democratic financing method enables crowdfunding entrepreneurs to adopt more flexible strategies in promoting their businesses to an unspecific crowd than to targeted institutional investors. Above all, what entrepreneurs need is investment from a proportion of potential investors, not endorsement from everyone in the crowd. Consequently, it is not impossible for entrepreneurs to strategically target a subgroup of investors or even window dress a business to dupe unsophisticated investors.

The dynamics of equity crowdfunding can be analyzed starting from two simple questions: which firms can be listed on an equity crowdfunding platform? Which investors can participate in equity crowdfunding?

The first question pertains to the listing requirement of equity crowdfunding platforms. In general, SEC requires equity crowdfunding platforms to apply due diligence to prevent fraudulent fundraising[1] but does not provide explicit guidelines on detailed procedures platforms should follow to ensure the genuineness of crowdfunding projects. In practice, platforms have ample flexibility in determining which projects to list. Platform managers usually discuss with entrepreneurs to assess proposed business plans before publicly releasing project information on a platform.[2] Some platforms conduct entrepreneur background verification, personal meeting or on-site visits, financial or credit checks, cross checks from social media connections, monitoring account activities and requesting third party certificates or proof on applied projects for investor protection (Cumming et al., 2019b). By and large, any firm free of potential fraud concerns discerned by a fundraising platform may launch an equity crowdfunding campaign. However, equity crowdfunding platforms may strategically impose additional project listing criteria to differentiate themselves from market competitors. Firms seeking equity crowdfunding are different in industry classification and in developing and production stages—from a rudimentary idea conception to mature products or service with proven marketing records. The fundraising targets of equity crowdfunding firms usually range from several hundred thousand dollars to over a million. Depending on platforms' policy, entrepreneurs may keep the entire amount raised, regardless of whether they meet fundraising goal, or keep nothing unless the fundraising goal is achieved (Cumming et al., 2019a).

The second question pertains to investor qualification in the evolving legislative environment. Equity crowdfunding is subject to high levels of regulation (Heminway and Hoffman, 2010) and was not generally permitted until very recent years (Cumming and Johan, 2013; Cumming and Johan, 2019; Mollick, 2014). Early on, to address small business entrepreneurs' increasing need of alternative financing channels, a few state securities regulators exempted equity crowdfunding within their respective jurisdictions: Kansas first legalized equity crowdfunding under the Invest Kansas Exemption (IKE) Act, which became effective in August 2011; a similar Invest Georgia Exemption Act became effective in December 2011, followed by Idaho (July 2012),[3] Michigan (December 2013), and Wisconsin (November 2013). By 2015, equity crowdfunding was legalized in 17 states[4] while 14 states[5] have proposed rules or introduced bills on equity crowdfunding exemptions (Bohliqa, 2015). However, intrastate equity crowdfunding exemptions have natural limitations: small businesses must be headquartered and investors have to be residents in the state. Different investment limits were also imposed on crowdfunding investors: from $100 for Maryland to $10,000 for Georgia, Michigan and Wisconsin, while Washington permitted an investment of 10% of annual income for investors with annual income over $100,000. Most states only granted accredited investors, measured by net worth or annual income, access to equity crowdfunding. The exception was Maine, in which issuers are permitted to sell equity to unaccredited investors. After various intrastate equity crowdfunding exemptions, on October 30, 2015, SEC officially announced the nationwide adoption of Title III of Jumpstart Our Business Start-ups (JOBS) Act, under which ordinary investors are permitted to invest in equity crowdfunding projects. Title III of the JOBS Act became effective on May 16, 2016.

3. Hypotheses

Equity investors are profit driven. They participate in the highly risky and illiquid crowdfunding market in the hope of sharing sizeable long-term profit with the next Google or Facebook. Nevertheless, failure in entrepreneurship is pervasive, especially for early stage start-ups (McGrath, 1999). Equity crowdfunding investors, realizing the risk of investing in start-ups, are selective in

[1] SEC open meeting fact sheet, October 20, 2015.

[2] Based on SEC requirements, information on an equity crowdfunding project has to be publicly disclosed on a registered crowdfunding platform for a minimum 21 days before security offering.

[3] Idaho's exemption on equity crowdfunding is based on administrative order.

[4] KS, GA, ID, MI, DC, TX, VT, AL, WA, WI, IN, MD, MR, MA, OR, TN, VA.

[5] NM, MS, CT, FL, HI, IA, KY, MN, NE, NH, NJ, NC, UT, WV.

crowdfunding projects and sensitive to information from entrepreneurs.

A part of firm information important to investors' decision-making is entrepreneurs' qualitative descriptions on business model, competitive strategy, product market, drivers and barriers for product/service adoption and business milestones. Introductions on start-up name, industry, location, products function and service types are compulsory identification information and not deemed as qualitative business information. Qualitative business information is important because it provides another channel for investors to evaluate a firm thus narrows the information gap with investors. Although providing qualitative business information is not compulsory, entrepreneurs who do not seize the opportunity to communicate with potential investors send out an undesirable signal on start-up quality. Qualitative business information however can also be cheap talk or biased self-appraisal, as it is not directly verifiable. Classical signaling theory suggests that the value of a signal is directly related to the cost to realize and send that signal (Connelly et al., 2011; Spence, 1974). Signals bearing no cost should have little value in revealing quality of a firm (Bhattacharya and Krishnan, 1999; Crawford and Sobel, 1982). As qualitative business information is costless signal, it should be valueless and therefore cannot be used to differentiate the quality between start-ups. Moreover, many entrepreneurs release only favorable information in fundraising campaigns. The qualitative business information may therefore be perceived by equity crowdfunding investors as biased statement, resulting in little change in their potential investment behavior.

Conversely, qualitative business information not only reveals startups' strategic framework, advantages over market competitors, growth potential, expected risk and operational records, but also signals entrepreneurs' business vision and professionalism. This information is complementary to quantitative records and enables potential investors to better assess start-up quality through classical methods such as SWOT (strength, weakness, opportunities and threats) analysis. Extant literature shows that nonverifiable information still influences expected customers' utility and profit of firm (Allon et al., 2011); linguistic tone is informative about stock returns (Baginski et al., 2016), and the effect of nonverifiable linguistic information is particularly important in online setting (Anglin et al., 2018). In the special context of crowdfunding, linguistic styles that make the campaigns and their founders more understandable boost the success of social campaigns (Parhankangas and Renko, 2017); entrepreneurs conveying positive psychological capital experience superior fundraising performance for reward-based crowdfunding (Anglin et al., 2018); and there is a negative correlation between use of accomplishment rhetoric and the speed with which individual investors fund microloans (Allison et al., 2013). Since the equity crowdfunding context exhibits similar information asymmetry problem between funders and project initiators as reward and lending crowdfunding contexts, qualitative business information should also impact fundraising outcome, although the mechanism and extent of influence are different in equity crowdfunding setting. We believe that a critical issue that may breach this gap may be measuring “readability” of qualitative business description. Inspired by Loughran and Mcdonald (2011, 2014), who report that the frequency of negative words used in public firms' 10-K documents reflects management insight and predicts future stock performance, we think that by using total number of words in entrepreneurs' qualitative business introductions to evaluate the level of disclosure on qualitative start-up characteristics and percentage of promotional words used in qualitative business introduction, we may be able to measure the extent of entrepreneurs' overstatement on start-up quality. With increased readability, investors thus may face less uncertainty in decision making and invest more in a start-up. Our hypothesis is as follows:

Hypothesis 1. The length of the qualitative business description is associated with a larger percentage of the project being funded and a larger amount of capital raised.

Since entrepreneurs have ample flexibility in descripting businesses, they are inclined to overstate quality to facilitate fundraising. Inevitably, entrepreneurs' sentiment and opinions are interwoven with factual statements in qualitative business information. In particular, promotional words—the words that reflect entrepreneurs' subjective opinion on the business, management team, product or service, intend to bring favorable effects to fundraising and cannot be directly verified—are used to convey business value and advertise funding campaigns to potential investors. The following is one example of promotional language used in an equity crowdfunding campaign:

> “There is no product like ours on the market; we are revolutionizing outdoor dining! Every restaurant owner, resort manager etc. that has seen our product is truly impressed and interested in our innovation, in fact, one restaurant owner came up with our new product motto ‘It will blow you away!’”

These promotional words in qualitative business information reflect entrepreneurs' confidence, optimism and business insight. Psychological research indicates that successful entrepreneurs have a psychological profile different from the less successful ones (Veciana, 2007). Recent study further shows that in the context of reward crowdfunding, there is a positive relationship between the use of positive psychological capital language and crowdfunding performance (Anglin et al., 2018). There is also evidence that advertising puffery can be persuasive when buyers' preference is private (Chakraborty and Harbaugh, 2014). Consequently, these valuable personal traits, reflected by positive words in qualitative business information, should be favored by crowdfunding investors. It is also possible that investors are not sophisticated enough to disentangle false quality signals from normal business promotions and therefore do not associate excessive promotional words with entrepreneurial credibility.

Alternatively, advertising puffery[6] may increase equity crowdfunding investors' skepticism on the entrepreneurial credibility and the reliability of information presented in crowdfunding campaigns. Investors are thus cautious about the promotional language used in crowdfunding campaigns: advertising puffery is recognized as mere “seller's talk” that is not to be believed (Rotfeld and Rotzoll,

[6] Puffery is defined as “advertising or other sales presentations that praise the product or service with subjective opinions, superlatives, or exaggerations, vaguely and generally, stating no specific facts” (Preston, 1975: 17).

2013). Empirical evidence also suggests that both familiarity and experience with the products significantly influence the *believability* of claims made by entrepreneurs (Haan and Berkey, 2002). Since most firms that go crowdfunding are young start-ups and lack of reputation in the market, they naturally face investor skepticism in equity crowdfunding. Further studies show that advertising credibility is highest for traditional media and lowest for the internet while advertising skepticism is highest for new media and lowest for print media (Moore and Rodgers, 2005). In this regard, equity crowdfunding creates a perfect context for investor skepticism. More broadly, the use of puffery was found to produce a negative change in (1) evaluations of the particular advertisement and sponsoring company; (2) message credibility; and (3) intent to purchase the advertised product (Bergh and Bergh and Reid, 2012). In this regard, while qualitative business introduction can be helpful, for a given length of qualitative business information, imprudent usage of promotional words indicates exaggerated start-up quality and compromised entrepreneurial credibility. In this regard, excessive use of promotional words in qualitative business information negatively affects crowdfunding outcomes. Unsurprisingly, the crowdfunding project in the above example failed. Our hypothesis is therefore as follows:

Hypothesis 2. The usage of promotional words in the business description is associated with lower funding success.

The effectiveness of equity crowdfunding entrepreneurs' quality signaling depends on sophistication of crowdfunding investors. Extant literature documents that the level of investor sophistication influences the extent to which investors are willing to pay for the cash flow rights of start-up businesses (Hornuf and Neuenkirch, 2015). In addition, variation in investor sophistication affects investors' ability to utilize disclosed information (Kalay, 2015). After many years of ordinary investors being prohibited in participating in a market reserved for sophisticated investors, the Title III of JOBS Act opened the doors to the arguably less sophisticated ordinary investors. As the overall level of investor sophistication decreases after the legislation change, how costless signals, especially qualitative business information, influence crowdfunding investors' willingness to contribute capital to a fundraising campaign is unclear. It is also possible that crowdfunding investors, especially unsophisticated ones, may underestimate the risks associated with high-risk investments or misread signals (Turan, 2015). In this case, ordinary equity crowdfunding investors may not necessarily respond to costless qualitative business information.

Then again, since less costly signals are influential when an audience is unsophisticated (Anglin et al., 2018; Loewenstein et al., 2014), we can expect enhanced influence of qualitative business information as the overall sophistication of crowdfunding investors declines. In addition, as wealthier investors are more risk averse (Paravisini et al., 2017), when ordinary, less wealthy investors participate in equity crowdfunding, we should expect them to be more willing to accept risker unverifiable qualitative business information. Further studies also show that, providing more detailed information to investors lack of financial sophistication can strongly impact the probability of funding success (Ahlers et al., 2015), as qualitative business information reveals business conditions not disclosed by data-driven business records, we should observe stronger impact of qualitative business information on equity crowdfunding outcomes after the implementation of Title III of JOBS Act. Our final hypothesis is thus as follows:

Hypothesis 3. The participation of less sophisticated investors in equity crowdfunding after the Title III of JOBS Act moderates the impact of qualitative business information on fundraising outcome.

4. Data

The data were provided by EquityNet,[7] an online platform focuses exclusively on equity crowdfunding. EquityNet adopts a “keep-it-all” model, in which entrepreneurs keep all capital raised from an equity crowdfunding campaign, regardless of whether the raised capital meets the fundraising target. This “keep-it-all” model is different from “all-or-nothing” model, where the entrepreneur keeps nothing unless the goal is achieved (Cumming et al., 2019a). The sample data disclose fundraising activities for 6870 start-ups,[8] covering a period from January 2007 to November 2016. In the sample, 5273 or 76.8% of start-ups are incorporated in United States; the rest are international firms. No start-up launched more than one fundraising campaign over the sample period. Crowdfunding entrepreneurs report business records and fundraising information to the crowdfunding platform; the platform then checks the validity and consistence of the reported information before listing a crowdfunding project online.

Start-ups in the sample cover 18 different industry sectors[9]; among which, the most represented sectors are manufacturing (16.4% of start-ups), information and cultural industries (11.6%), professional, scientific and technical services (11.1%) and retail trade (10.9%).[10] The amounts of capital start-ups seek ranges from $15,000 to $5,000,000. Over the sample period, 2497 or 36.4% of start-ups have fully achieved their fundraising targets. On average, a start-up raises $270,000 through equity crowdfunding.

A representative start-up[11] in the data is incorporated in the United States 1 year prior to a crowdfunding campaign and has around $100,000 annual revenue before an equity offering. It is operated by 2 male managers who hold undergraduate or graduate

[7] https://www.equitynet.com/

[8] We dropped observations without explicit indication of fundraising target, which accounts for approximately 5% of total observations.

[9] Industry classification is based on the first two digits of North American Industry Classification System (NAICS) code.

[10] Other industry sector representations are: real estate and rental and leasing (7.7%), health care and social assistance (5.1%), other services except public administration (4.8%), arts, entertainment and recreation (4.6%), administrative and support, waste management and remediation services (4.2%), finance and insurance (4.1%), construction (4.0%), transportation and warehousing (3.4%), accommodation and food services (3.1%), educational services (2.6%), wholesale trade (2.0%), utilities(1.8%), mining, quarrying, and oil and gas extraction (1.4%) and agriculture, forestry, fishing and hunting (0.8%).

[11] A representative start-up exhibits median values for variables included in summary statistic table.

Table 1
Variable definitions and summary statistics. Table 1 defines the variables in the data set and provides summary statistics for equity crowdfunding activities in EquityNet between January 2007and November 2016.

Variable name	Definition	Min	Mean	Max	S.D.	Obs
Percent of fundraising plan completed	Percentage of fundraising target achieved: 1 stands for 100%.	0.0000	0.6305	1.0000	0.3457	6870
Amount of capital raised (log transformed)	Total amount of capital raised in U.S. dollar through an equity crowdfunding campaign. Data is log transformed as ln (1 + capital raised)	0.0000	12.5062	14.9141	2.3261	6870
Length of qualitative business description	Number of words used in qualitative business description. 1 unit stands for 100 words.	0.0000	3.0483	17.5300	3.6239	6870
Number of promotional words	Number of promotional words used in qualitative business descriptions. 1 unit stands for 100 words	0.0000	0.1727	1.4700	0.3139	6870
Percent of promotional words used in business description	Number of promotional words used divided by total number of words used in business description. Start-ups without business descriptions are excluded.	0.0000	0.07489	0.2886	0.04120	5424
Amount of capital seeking (log transformed)	Amount of capital a start-up seeks from investors. Data is log transformed.	9.6158	13.2636	15.4250	1.2254	6870
Number of managers	Number of managers in a start-up	1.0000	2.5265	12.0000	2.1359	6870
Percentage of female managers	Percentage of female managers in management team	0.0000	0.2751	1.0000	0.3149	6870
Average industry experience	Average years in corresponding industry for start-up managers	0.0000	6.9444	40.0000	9.6280	6870
Average education level	Average educational level for start-up managers in scale: high school 1, some undergraduate/associates 2, Completed Undergraduate 3, Some Graduate 4, Completed Graduate 5, Some Doctorate 6, Completed Doctorate 7.	1.0000	3.2683	7.0000	1.4582	6870
Estimated product market size (log transformed)	Estimated product market size in U.S. dollars. Data is log transformed.	15.4249	25.5675	29.5301	3.2646	6870
Firm revenue (log transformed)	Start-up revenue in U.S. dollars in the year prior to crowdfunding campaign. Data is log transformed. If no revenue is reported, log transformed value is treated as 0.	0.0000	12.8610	14.4885	2.6490	6870
Equity retention ratio	Percentage of common shares a start-up will retain after crowdfunding	0.01458	0.3638	0.9126	0.2479	6870
Percentage of R&D expense	Start-up R&D expense over revenue in the year prior to crowdfunding campaign. If no revenue is reported, median R&D expense ratio of corresponding industry in the sample data-set is used.	0.0000	0.1003	0.5594	0.1306	6870
Difficult level of staffing	The scale is 1–7, where 7 indicate staffing is very difficult.	1.0000	5.1307	7.0000	1.6694	6870
Planed exit channel available? (Yes = 1; No = 0)	Does a start-up indicate planned exit channel in crowdfunding campaign? Yes = 1; No = 0	0.0000	0.4773	1.0000	0.4995	6870
Pre-funding start-up value available? (Yes = 1; No = 0)	Does a start-up indicate estimated firm value prior to crowdfunding campaign? Yes = 1; No = 0	0.0000	0.4242	1.0000	0.4943	6870
Estimated start-up value (log transformed)	Estimated firm value prior to crowdfunding campaign in U.S. dollars. Data is log transformed.	10.8198	14.7859	16.1181	1.4220	6870
U.S. firm? (Yes = 1; No = 0)	Does a start-up incorporated in U.S.? Yes = 1; No = 0	0.0000	0.7675	1.0000	0.4224	6870
Start-up age	Number of complete years from start-up incorporation to crowdfunding campaign	0.0000	2.9237	18.0000	4.7709	6870
Average number of photos per manager	Total number of management team photos divided by number of managers	0.0000	0.3487	1.0000	0.4131	6870
Video used in fundraising campaign? (Yes = 1; No = 0)	Is there a video embedded in crowdfunding campaign? Yes = 1; No = 0	0.0000	0.2256	1.0000	0.4180	6870

degrees but have no related industry experience. The start-up reports an estimated product/service market size of 3.6 billion USD and wants to raise $400,000 USD through offering around 70% of common shares. However, the start-up neither provides estimated firm value nor indicates planned exit channel[12] to potential investors. In addition, it does not provide entrepreneurs' photos or adopt videos in its business introduction. The representative start-up fails to achieve its fundraising target.

Table 1 reveals general characteristics of crowdfunding activities in the sample.

Table 1 shows that a representative start-up uses 182 words to introduce business model, competitive strategy, product market, drivers and barriers for product/service adoption and business milestones to potential investors. Qualitative business information is widely provided by crowdfunding entrepreneurs to reveal quality and reduce information gap with potential investors.

Fig. 1 exhibits a general view on disclosure of qualitative business information among start-ups seeking equity crowdfunding.

[12] Start-up entrepreneurs may indicate their planned exit channels for potential investors. The following investment exit channels are specified by entrepreneurs seeking external financing from crowd: business merger, acquisition, management buy-out, IPO, issuing debt (short-term, long-term, and convertible) to buy back equity, and secondary private offering.

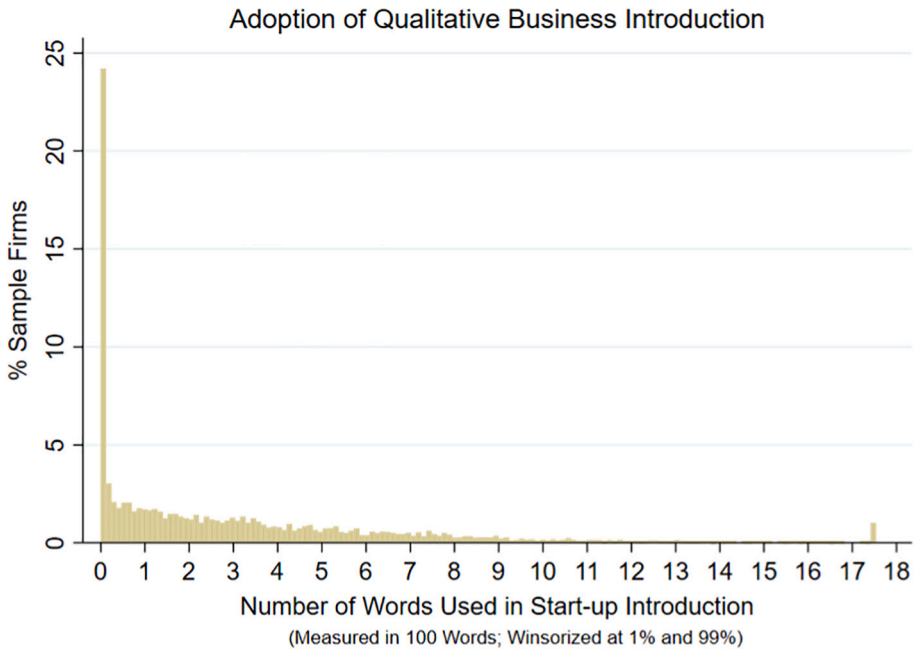

Fig. 1. Illustrates the general conditions regarding adopting qualitative business introduction among start-ups seeking equity crowdfunding.

Fig. 1 shows that, in regards to qualitative business introduction, 23.9% of start-ups use 10 or fewer words; 15.2% of start-ups use between 11 words and 100 words; 22.8% of start-ups use between 101 words and 300 words; 15.1% of start-ups use between 301 words and 500 words; 17.4% of start-ups use between 501 words and 1000 words; 5.6% of start-ups use more than 1000 words. The impact of qualitative business information on crowdfunding outcome is briefly illustrated in Fig. 2.

Fig. 2 shows that the length of qualitative business introduction is positively associated with percentage of fundraising plan completed. Among qualitative introductory words used by an average start-up, 25 words are identified as promotional words because they reflect entrepreneur's positive self-appraisal on the business. These words are adopted to highlight start-up quality, despite that the underlying content is often biased and not verifiable.

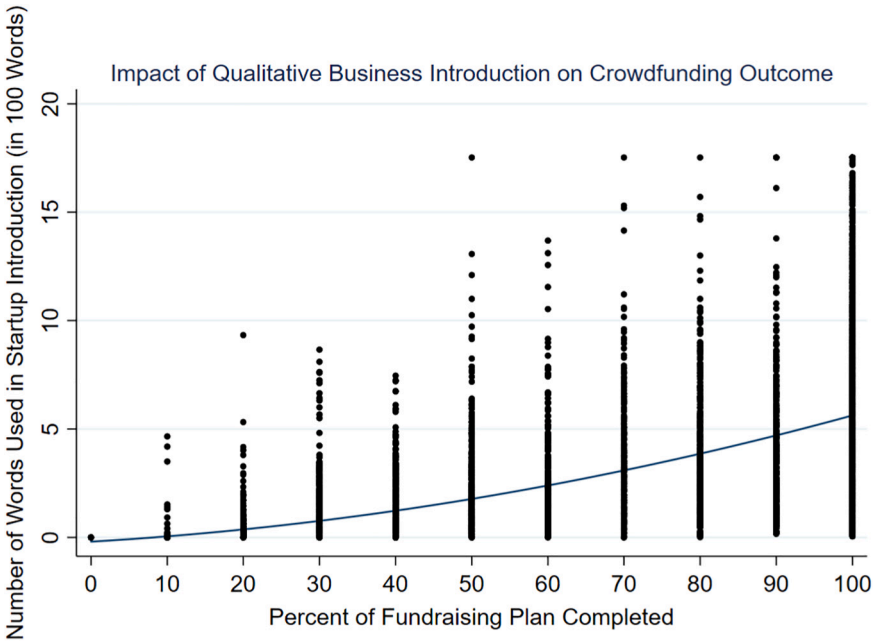

Fig. 2. Illustrates the impact of adopting qualitative business introduction on percentage of fundraising plan completed in equity crowdfunding. Each dot reflects the condition for one start-up; the fitted line shows the evolving trend based on median value of each start-up group classified by percentage of fundraising plan completed.

Table 2
Most frequently used promotional words. Table 2 presents the top 50 most frequently used promotional words in equity crowdfunding campaigns. Promotional words are used by start-up entrepreneurs to emphasize start-up quality and attract investor attention.

	Cumulative frequency		Cumulative frequency
New	6727	advantage	1233
More	5824	improve/improved/improvement	1227
Grow/growing	5732	best	1150
High	4930	significant	1144
Add value	4595	established	1120
Large/largely/larger/largest	3700	rise	1110
Increase/increased/increasing	3695	effective	1098
Well	3482	good	1073
First	3424	cutting edge	1058
Most	3141	big/bigger/biggest	1049
Value/valuable	2850	efficient/efficiency	1043
Proper	2228	strong	1029
Quality	2114	innovate/innovation/innovative	996
Experienced	1920	much	996
Expand/expansion	1718	safe	984
Wide	1707	early	981
Key	1666	fast	966
Competitive	1617	better	943
Success/successful	1604	international	939
Unique/uniquely	1592	quick	770
Lead	1587	super/superior/superlative	761
Top	1473	smart	692
Great	1465	broad	670
Profession/professional/professionalism	1424	advance	627
Global	1419	expert	614

Table 2 shows the most frequently used promotional words in equity crowdfunding campaigns. A complete vocabulary list[13] of promotional words is provided in the online appendix.

Fig. 3 illustrates the distribution on usage of promotional words among start-ups seeking equity crowdfunding.

Fig. 3 shows that for the general sample, 24.2% of start-ups do not use any promotional language. In addition, promotional words account for 6.4% of total words used in qualitative business introduction on average and 7.4% for a representative start-up. Within the subsample of start-up firms that provide qualitative business information, promotional words account for 8.4% of total words used on average and 8.3% for a representative start-up.

Table 3 reveals the general correlations among variables describing equity crowdfunding activities. Both percentage of fundraising plan completed and amount of capital raised are positively associated with entrepreneurs' educational level and relevant industry experience, estimated product market size, firm revenue, equity retention ratio, estimated start-up value, availability of entrepreneurs' photo and video illustration. These correlations are statistically significant at 1% level.

Table 3 also shows that, contrary to conclusions in extant literature, both percentage of fundraising plan completed and amount of capital raised are also positively associated with number of managers and amount of capital seeking, indicating that in general, large start-ups are more likely to achieve better equity crowdfunding outcomes than small start-ups. One possible explanation is that large start-ups that seek more capital from investors are better prepared in equity crowdfunding campaigns through disclosing more detailed business information; their better communication with potential investors overcomes size disadvantage. In addition, percentage of R&D expense, difficult level of staffing, and located in U.S. are positively correlated with better equity crowdfunding outcomes, indicating investors' preference on business innovation, sophistication of human capital and domestic start-ups.

It is also worth noting that length of qualitative business introduction is positively associated with higher fundraising plan completed and larger amount of capital raised, indicating that qualitative information facilitates fundraising. Surprisingly, frequency of promotional words used is positively correlated with crowdfunding outcomes. One possible explanation is that frequency of promotional words is associated with length of business introduction; the positive correlation may capture the impact of detailed qualitative introduction on crowdfunding outcomes. Further detailed variable relationships are presented in the correlation matrix.

The interpretation of variable correlations is not conclusive, as it does not control for possible confounding factors. The following multivariate analyses investigate equity crowdfunding activities in detail.

[13] The complete vocabulary list is based on positive sentiment words included in Loughran-McDonald Sentiment Word List (2018), with additional promotional words added to make the list suitable for the context of equity crowdfunding. We manually screened qualitative business introductions for all projects covered in the sample and picked the words that reflect entrepreneurs' subjective opinion on the business, management team, product or service, are intended to bring favorable effects to fundraising but are not directly verifiable. These manually picked words are then merged with Loughran-McDonald Sentiment Word List (2018) to form our complete vocabulary list.

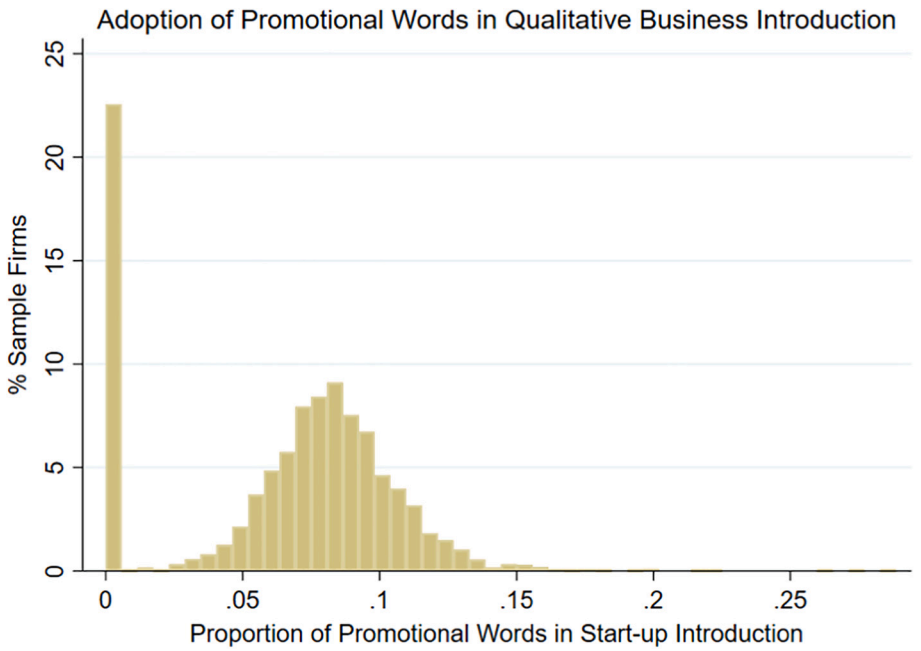

Fig. 3. Illustrates the general conditions regarding adopting promotional words in qualitative business introduction among start-ups seeking equity crowdfunding.

5. Multivariate analyses

This section examines the impacts of qualitative business introduction and usage of promotional language on equity crowdfunding outcomes. Analyses on percentage of fundraising plan completed and probability of achieving fundraising target are presented first, followed by analyses on amount of capital raised from crowdfunding campaigns.

For analyses about the impact of qualitative start-up information on percentage of fundraising plan completed, the basic model specifications follow

(1) Percentage of Fundraising Plan Completed = Constant + β1 * Post Title III of JOBS Act Dummy + β2 * Length of Qualitative Introduction + β3 * Number of Promotional Words + β4 * Interaction Variables + β5 * Controls + Residuals

The dependent variable is percentage of fundraising plan completed, as EquityNet adopts the "Keep-it-all" model. The main explanatory variables of interests are the dummy variable indicating whether a fundraising campaign was launched after the Title III of JOBS Act, the length of qualitative business introduction, number of promotional words used in business introduction, the interaction variable between Title III of JOBS Act and length of qualitative business introduction and the interaction variable between Title III of JOBS Act and number of promotional words. The regression controls for the following five categories of variables: first, operational characteristics, including start-up age, annual revenue, availability of estimated business value prior to crowdfunding campaign, R&D expense, and domestic versus foreign dummy variable; second, human resource characteristics, including number of managers, industry experience and educational level of management team and difficult level of staffing; third, market potential, i.e. estimated product market size; fourth, equity offering conditions, including equity retention ratio, fundraising target and availability of planned investment exit channel; fifth, campaign promotional tactics, including availability of video illustration and entrepreneur photos. We also used percentage of promotional words in qualitative business introduction in lieu of length of qualitative introduction and number of promotional words in analyses; the results are consistent and not reported for conciseness.[14] The analyses are based on panel regressions with robust standard errors.[15]

Table 4 present regression analyses on percentage of fundraising plan completed.

Table 4 shows that more detailed qualitative business introduction leads to higher percentage of fundraising plan completed. On average, before the Title III of JOBS Act, a one standard deviation increase or an increase of 362 words in length of qualitative

[14] In addition, we tested models including both length of qualitative introduction and percentage of promotional words in qualitative business introduction as explanatory variables. The results are consistent, although the marginal impact of length of qualitative introduction varies under different model specifications.

[15] We tested cross-sectional regressions with standard errors clustering on both start-up industry and equity crowdfunding campaign initiation month, the impacts of qualitative business information and number of promotional words on fundraising outcomes are consistent. Panel regression is used in the models to evaluate the impact of Title III of JOBS Act.

Table 3
Correlation matrix. Table 3 presents the correlations among variables of interest.

	Percent plan completed	Amount cap. raised	Length of introduction	Percent of promotional words	Amount cap. seeking	No. managers	Ave. industry experience	Ave. edu. level	Market size	Firm revenue	Equity retention ratio
Percent plan completed	1										
Amount cap. raised	0.793***	1									
Length of introduction	0.616***	0.547***	1								
Percent of promotional words	0.494***	0.463***	0.645***	1							
Amount capital seeking	0.386***	0.372***	0.541***	0.457***	1						
Number of managers	0.544***	0.539***	0.565***	0.508***	0.535***	1					
Average industry experience	0.596***	0.554***	0.463***	0.400***	0.550***	0.484***	1				
Average educational level	0.550***	0.476***	0.502***	0.422***	0.672***	0.547***	0.612***	1			
Market size	0.503***	0.670***	0.614***	0.503***	0.664***	0.524***	0.530***	0.359***	1		
Firm revenue	0.445***	0.531***	0.595***	0.520***	0.724***	0.556***	0.531***	0.540***	0.669***	1	
Equity retention ratio	0.497***	0.514***	0.391***	0.356***	0.513***	0.388***	0.367***	0.429***	0.446***	0.519***	1
Per. R&D expense	0.264***	0.252***	0.209***	0.186***	0.250***	0.218***	0.197***	0.259***	0.236***	0.269***	0.198***
Difficult. staffing level	0.207***	0.398***	0.348***	0.238***	0.396***	0.264***	0.303***	0.384***	0.456***	0.361***	0.216***
Exit channel available	0.642***	0.591***	0.532***	0.455***	0.490***	0.521***	0.557***	0.697***	0.681***	0.537***	0.553***
Pre-funding value available	0.578***	0.429***	0.528***	0.460***	0.626***	0.514***	0.541***	0.650***	0.652***	0.520***	0.624***
Est. start-up value	0.354***	0.332***	0.554***	0.490***	0.528***	0.545***	0.549***	0.646***	0.656***	0.437***	0.401***
U.S. firm	0.383***	0.242***	0.224***	0.156***	0.242***	0.184***	0.215***	0.225***	0.263***	0.218***	0.143***
Start-up age	−0.0974***	−0.0381**	−0.00643	0.00934	−0.0374**	0.0139	0.0851***	−0.0139	−0.0391**	−0.0257*	−0.00230
Ave. photo number	0.454***	0.421***	0.331***	0.280***	0.417***	0.245***	0.372***	0.418***	0.398***	0.364***	0.264***
Video used	0.197***	0.217***	0.259***	0.234***	0.214***	0.223***	0.160***	0.175***	0.207***	0.212***	0.196***

	Per. R&D expense	Difficult staffing level	Exit channel available	Pre-funding start-up value available	Est. start-up value	U.S. firm	Start-up age	Ave. photo number	Video used
Percent plan completed									
Amount cap. raised									
Length of introduction									
Percent of promotional words									
Amount capital seeking									
Number of managers									
Average industry experience									
Average educational level									
Market size									
Firm revenue									
Equity retention ratio									
Per. R&D expense	1								
Difficult. staffing level	0.102***	1							
Exit channel available	0.270***	0.414***	1						
Pre-funding value available	0.270***	0.366***	0.880***	1					
Est. start-up value	0.276***	0.350***	0.349***	0.464***	1				
U.S. firm	0.0685***	0.342***	0.244***	0.216***	0.213***	1			
Start-up age	0.00574	−0.119***	−0.0394**	−0.0231	−0.00268	−0.100***	1		
Ave. photo number	0.117***	0.241***	0.413***	0.376***	0.376***	0.120***	−0.0166	1	
Video used	0.0846***	0.0886***	0.191***	0.212***	0.235***	0.0431***	0.0537***	0.243***	1

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

introduction increases percentage of fundraising plan completed by 2.7% - 3.3%[16]; After the Title III of JOBS Act, a one standard deviation increase in length of qualitative introduction increases percentage of fundraising plan completed by 4.6% - 4.9%.[17] In addition, usage of promotional language results in lower percentage of fundraising plan completed before the Title III of JOBS Act. On average, before Title III of JOBS Act, a one standard deviation or an increase of 31 promotional words used in qualitative business introduction reduces percentage of fundraising plan completed by 0.9%–1.5%; nevertheless, the adoption of Title III of JOBS Act significantly moderated the negative impact of promotional language on percentage of fundraising plan completed such that a one standard deviation or an increase of 31 promotional words used in qualitative business introduction only reduces percentage of fundraising plan completed by 0.0%–0.3%. These results are at least statistically significant at 5% level and strongly consistent with Hypothesis 1 and Hypothesis 3.

The empirical results from Table 4 provide mixed information with respect to Hypothesis 2. Before the Title III of JOBS Act, when only sophisticated investors were permitted in equity crowdfunding, usage of promotional language is indeed associated with lower funding success, suggesting that investors with high net-worth and extensive experience in financial markets are resistant to entrepreneurs' boosting of business quality, consistent with the advertising puffery theory. After the Title III of JOBS Act, when less sophisticated investors were permitted in equity crowdfunding, usage of promotional language is however no longer associated with lower funding success, suggesting that ordinary investors are attracted by entrepreneurs' emotional appealing and associate it with entrepreneurs' ability and successfulness.

Table 4 also shows that in respect of human recourse, richer industry experience and higher educational level in the management team lead to better funded results. Difficult level of staffing, which indicates employee sophistication, also has a positive impact on percentage of plan completed. Estimated market size and start-up revenue exhibit positive impact on percentage of plan completed.

Table 4 points out that whether a start-up indicates planned exit channel to potential investors is of critical importance on percentage of fundraising plan completed. Over the sample period, no start-up fulfills its fundraising plan without indicating planned investment exit channel. Although firms seeking equity crowdfunding face high uncertainties at early development stage and their planned investment exit channels may never be realized, setting up a target investment exit channel signals the direction of strategic business movement and reveals entrepreneurs' attitude on fiduciary duty in asset management. In addition, whether a start-up indicates estimated firm value prior to a crowdfunding campaign also positively impacts fundraising outcome. Further analyses reveal that in respect to percentage of fundraising plan completed, investors do not exhibit preferences on particular investment exit channels and are insensitive to the specific amount of estimated start-up value; the according results are not reported for conciseness.

Table 4 further reveals that a domestic start-up is more likely to achieve fundraising target than a comparable foreign start-up. In addition, providing entrepreneur photos facilitates fundraising. Investors also exhibit preference on younger start-ups. These effects are all statistically significant at 1% level. Start-up R&D expense does not exhibit statistically significant impact on percentage of fundraising plan completed.

We also use Logit models to further examine how the length of qualitative business introduction and usage of promotional words impact the probability of successful fundraising and find that length of qualitative business introduction and number of promotional words are positively and negatively, respectively, associated with probability of fundraising success. The regression results are presented in Online Appendix 2.

For analyses about the impact of qualitative start-up information on amount of capital raised, the basic model specifications follow:

(2) Amount of Capital Raised = Constant + β1 * Post Title III of JOBS Act Dummy + β2 * Length of Qualitative Introduction + β3 * Number of Promotional Words + β4 * Interaction Variables + β5 * Controls + Residuals

Table 5 shows that, for all start-ups included in the sample, startups on average raised 31.9%–45.2%[18] more capital after the Title III of JOBS Act. Qualitative business information and promotional language have positive and negative impacts, respectively, on amount of capital raised from equity crowdfunding campaigns. However, the marginal impacts of qualitative information on amount of capital raised vary significantly after the Title III of JOBS Act. Before the Title III of JOBS Act, on average, a one standard deviation increase or an increase of 362 words in length of qualitative business information increases amount of capital raised by 21.5%–27.5%,[19] compared with 47.6%–48.6% increase after the Title III of JOBS Act; a one standard deviation or an increase of 31 promotional words used in qualitative business introduction reduces amount of capital raised by 12.0%–18.4%, compared with 2.4%–4.3% reduction after the Title III of JOBS Act. These effects are at least statistically significant at 5% level and are consistent with Hypothesis 1, Hypothesis 2, and Hypothesis 3.

[16] The marginal impact of length of qualitative business introduction before Title III of JOBS Act is calculated as: 0.00475 (regression coefficient) *3.6239 (standard deviation of explanatory variable)/0.6305 (mean value of dependent variable) = 2.7%.

[17] The marginal impact is calculated as [0.00295(regression coefficient) *3.6239 (standard deviation of explanatory variable) + 0.00498*3.6239]/0.6305(mean value of dependent variable) = 4.6%.

[18] The marginal impact is calculated as: exp.[0.277 (regression coefficient) + 12.5062 (mean value of dependent)]/exp.(12.5062)-1 = 31.9%.

[19] The Marginal impact is calculated as: 0.0537 (regression coefficient) *3.6239 (standard deviation of explanatory variable) = 0.1946 (the incremental part in natural log transformed value). The according amount of capital raised is e^ [12.5062(mean value of dependent variable) + 0.1946] = 328,011. On average, the amount of capital raised is e^12.5062 = 270,000. The rate of increase is (328011–270,000)/270,000 = 21.5%.

Table 4
Analyses on percentage of fundraising plan completed. Table 4 presents ordinary least square regressions evaluating the impact of qualitative business descriptions and usage of promotional words on equity crowdfunding outcome. The dependent variable is the percentage of fundraising plan completed for a crowdfunding project. Standard errors are robust.

	Model 1	Model 2	Model 3	Model 4
Campaign launched after Title III of JOBS Act? (Yes = 1; No = 0)	−0.0126***	−0.0202***	−0.0157***	−0.0208***
	(−3.93)	(−5.04)	(−4.31)	(−5.16)
Length of qualitative business description	0.00569***	0.00498***	0.00575***	0.00475***
	(6.93)	(6.02)	(6.98)	(5.67)
Number of promotional words	−0.0259***	−0.0255***	−0.0305***	−0.0180**
	(−3.33)	(−3.26)	(−3.77)	(−2.15)
Length of qualitative business description * campaign launched after Title III of JOBS Act		0.00295***		0.00381***
		(3.59)		(3.97)
Number of promotional words * campaign launched after Title III of JOBS Act			0.0242**	0.0181**
			(2.29)	(2.11)
Number of managers	−0.00133*	−0.00103	−0.00119	−0.00109
	(−1.80)	(−1.39)	(−1.60)	(−1.47)
Average industry experience	0.00119***	0.00118***	0.00118***	0.00120***
	(5.68)	(5.64)	(5.64)	(5.70)
Average educational level	0.0210***	0.0209***	0.0210***	0.0208***
	(17.05)	(16.97)	(17.03)	(16.90)
Estimated product market size (log transformed)	0.00679***	0.00679***	0.00678***	0.00680***
	(26.04)	(26.04)	(25.98)	(26.07)
Firm revenue (log transformed)	0.00433***	0.00433***	0.00431***	0.00432***
	(10.64)	(10.65)	(10.62)	(10.64)
Percentage of R&D expense to revenue	0.0315	0.0319*	0.0311	0.0324*
	(1.63)	(1.66)	(1.62)	(1.68)
Difficulty level of staffing	0.0112***	0.0112***	0.0112***	0.0112***
	(12.99)	(13.00)	(13.00)	(13.01)
Planned exit channel available? (Yes = 1; No = 0)	0.224***	0.225***	0.225***	0.224***
	(20.08)	(20.09)	(20.08)	(20.05)
Pre-funding start-up value available? (Yes = 1; No = 0)	0.0452***	0.0455***	0.0453***	0.0455***
	(5.01)	(5.04)	(5.02)	(5.04)
Average number of photos per manager	0.0416***	0.0403***	0.0409***	0.0410***
	(8.50)	(8.16)	(8.29)	(8.30)
U.S. firm? (Yes = 1; No = 0)	0.0424***	0.0423***	0.0423***	0.0421***
	(11.43)	(11.38)	(11.39)	(11.33)
Start-up age	−0.00243***	−0.00244***	−0.00243***	−0.00244***
	(−8.17)	(−8.19)	(−8.18)	(−8.19)
Control for equity retention ratio?	Yes	Yes	Yes	Yes
Control for video used in fundraising campaign?	Yes	Yes	Yes	Yes
Control for amount of capital seeking?	Yes	Yes	Yes	Yes
Control for startup industry dummies?	Yes	Yes	Yes	Yes
Constant	0.145***	0.149***	0.146***	0.149***
	(39.16)	(37.37)	(38.23)	(37.39)
Number of observations	6870	6870	6870	6870
R^2	0.894	0.894	0.894	0.894

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Consistent with Table 4, managerial industry experience, educational level, availability of investment exit channel, estimated product/service market size, and firm revenue have positive impact on amount of capital raised. These effects are statistically significant at 5% level. Table 5, however, exhibits different results than Table 4 in that number of managers is positively associated with amount of capital raised. This effect is statistically significant at 1% level.

We also analyze the subsample of start-ups that achieved 100% of fundraising targets for the impact of qualitative business information and usage of promotional language on amount of capital raised. The analyses results are presented in Table 6. The subsample analysis is important because fully funded startups could exhibit materially different group characteristics than average startups, resulting in different investors' preferences and investing behavior.

The regressions in Table 6 control for similar variables as Table 5. However, fundraising target is not included as a control variable: for fully funded start-ups, amount of capital raised equals amount of capital seeking. Overfunding is not observed over the sample horizon. All fully funded start-ups have indicated planned exit channels.

Table 6 further reveals that, fully funded start-ups raised more capital after the Title III of JOBS Act; overall, length of qualitative business introduction and number of promotional words are, positively and negatively, associated with larger amount of capital raised. However, the negative impact of promotional language on amount of capital raised is mitigated after the Title III of JOBS Act, showing that ordinary investors are less resistant to promotional language. The analyses result for the subsample is consistent with Hypothesis 1, Hypothesis 2 and Hypothesis 3.

Table 6 also shows that, number of managers, managerial industry experience, estimated start-up value, estimated product market

Table 5
General analyses on amount of capital raised. Table 5 presents regressions evaluating the impact of qualitative business descriptions and usage of promotional words on equity crowdfunding outcome. The dependent variable is the amount of capital raised from an equity crowdfunding campaign after log transformation. Standard errors are robust.

	Model 1	Model 2	Model 3	Model 4
Campaign launched after Title III of JOBS Act? (Yes = 1; No = 0)	0.373***	0.286**	0.343***	0.277**
	(2.99)	(2.24)	(2.74)	(2.17)
Length of qualitative business description	0.0661***	0.0537***	0.0670***	0.0580***
	(3.27)	(2.60)	(3.31)	(2.84)
Number of promotional words	−0.416**	−0.406**	−0.647***	−0.617***
	(−2.02)	(−1.97)	(−2.89)	(−2.66)
Length of qualitative business description * after Title III of JOBS Act		0.0538***		0.0513**
		(3.22)		(2.10)
Number of promotional words * campaign launched after Title III of JOBS Act			0.568***	0.476***
			(3.15)	(2.66)
Number of managers	0.125***	0.133***	0.131***	0.134***
	(5.81)	(6.08)	(6.01)	(6.16)
Average industry experience	0.0106*	0.0104*	0.0102*	0.0100*
	(1.79)	(1.77)	(1.72)	(1.70)
Average educational level	0.0904**	0.0892**	0.0921***	0.0917***
	(2.55)	(2.52)	(2.60)	(2.59)
Estimated product market size (log transformed)	0.0154**	0.0156**	0.0152**	0.0152**
	(2.42)	(2.46)	(2.39)	(2.39)
Firm revenue (log transformed)	0.0817***	0.0820***	0.0819***	0.0821***
	(7.38)	(7.41)	(7.40)	(7.43)
Percentage of R&D expense to revenue	−0.425	−0.419	−0.438	−0.412
	(−0.75)	(−0.73)	(−0.77)	(−0.72)
Difficulty level of staffing	−0.0104	−0.0102	−0.0104	−0.0107
	(−0.53)	(−0.52)	(−0.53)	(−0.54)
Planned exit channel available? (Yes = 1; No = 0)	7.986***	7.987***	7.994***	7.997***
	(28.75)	(28.78)	(28.81)	(28.84)
Pre-funding start-up value available? (Yes = 1; No = 0)	2.031***	2.040***	2.034***	2.035***
	(7.70)	(7.74)	(7.72)	(7.73)
Average number of photos per manager	0.648***	0.585***	0.596***	0.549***
	(4.81)	(4.32)	(4.40)	(4.03)
U.S. firm? (Yes = 1; No = 0)	0.170**	0.179**	0.179**	0.186**
	(1.99)	(2.10)	(2.09)	(2.18)
Start-up age	−0.0141**	−0.0140**	−0.0141**	−0.0142**
	(−1.98)	(−1.97)	(−1.98)	(−1.98)
Control for equity retention ratio?	Yes	Yes	Yes	Yes
Control for video used in fundraising campaign?	Yes	Yes	Yes	Yes
Control for amount of capital seeking?	Yes	Yes	Yes	Yes
Control for startup industry dummies?	Yes	Yes	Yes	Yes
Constant	−0.0477	−0.0411	−0.0460	−0.0409
	(−0.85)	(−0.73)	(−0.82)	(−0.73)
Number of observations	6870	6870	6870	6870
R^2	0.824	0.824	0.824	0.824

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

size and firm value all have positive impact on amount of capital raised from equity crowdfunding for the subsample of fully funded start-ups; the effects are at least statistically significant at 5% level. Contrary to full sample analysis reported in Table 5, in Table 6, the interaction variable between Length of Qualitative Business Description and After Title III of the JOBS Act is no longer statistically significant. Overall, empirical evidence suggest that in the context of equity crowdfunding, costless linguistic signals impact fundraising outcomes such that the length of qualitative business introduction is associated with a higher percentage of fundraising plan achieved and an increased chance of fundraising success; this association is further enhanced after the introduction of less sophisticated ordinary investors in equity crowdfunding after the Title III of JOBS Act. However, promotional language is not favored by sophisticated equity crowdfunding investors, as it results in lower percentage of fundraising plan completed and lesser amount of capital raised.

Empirical results also show that ordinary investors exhibit different preferences than sophisticated investors when perceiving promotional language. While sophisticated investors treat promotional language as advertising puffery and are skeptical on entrepreneurs' baseless statements; ordinary investors are attracted to promotional language and associate it with entrepreneurs' ability and successfulness.

Table 6
Subsample analyses on amount of capital raised. Table 6 presents regressions evaluating the impact of qualitative business descriptions and usage of promotional words on equity crowdfunding outcome. Only fully funded equity crowdfunding projects are included in the analyses. The dependent variable is the amount of capital raised from an equity crowdfunding campaign after log transformation. Standard errors are robust.

	Model 1	Model 2	Model 3	Model 4
Campaign launched after Title III of JOBS Act? (Yes = 1; No = 0)	0.560***	0.426**	0.469**	0.462**
	(2.85)	(2.53)	(2.35)	(2.19)
Length of qualitative business description	0.0812***	0.0768***	0.0829***	0.0801***
	(4.00)	(3.73)	(4.08)	(3.87)
Number of promotional words	−0.384**	−0.373*	−0.622***	−0.643***
	(−1.99)	(−1.93)	(−2.88)	(−2.86)
Length of qualitative business description * after Title III of JOBS Act		0.0191		0.00427
		(1.21)		(0.27)
Number of promotional words * campaign launched after Title III of JOBS Act			0.582***	0.546***
			(3.69)	(3.40)
Number of managers	0.0890***	0.0927***	0.0945***	0.0938***
	(4.83)	(5.02)	(5.13)	(5.13)
Average industry experience	0.0183***	0.0182***	0.0175***	0.0175***
	(3.04)	(3.02)	(2.91)	(2.90)
Average Educational Level	0.0293	0.0275	0.0303	0.0323
	(0.64)	(0.61)	(0.67)	(0.71)
Estimated product market size (log transformed)	0.0829***	0.0828***	0.0830***	0.0826***
	(6.59)	(6.59)	(6.62)	(6.59)
Firm revenue (log transformed)	0.0785***	0.0779***	0.0788***	0.0789***
	(5.91)	(5.88)	(5.95)	(5.95)
Percentage of R&D expense to revenue	−0.147	−0.153	−0.158	−0.132
	(−0.23)	(−0.24)	(−0.25)	(−0.20)
Difficulty level of staffing	0.00825	0.0106	0.00908	0.00841
	(0.22)	(0.28)	(0.24)	(0.22)
Pre-funding start-up value available? (Yes = 1; No = 0)	0.579**	0.594**	0.584**	0.583**
	(2.13)	(2.18)	(2.15)	(2.15)
Average number of photos per manager	0.463***	0.412***	0.400***	0.397***
	(3.50)	(3.10)	(3.04)	(3.00)
U.S. firm? (Yes = 1; No = 0)	0.118	0.132	0.143	0.148
	(0.67)	(0.74)	(0.81)	(0.84)
Start-up age	0.00459	0.00479	0.00473	0.00422
	(0.29)	(0.30)	(0.30)	(0.27)
Control for equity retention ratio?	Yes	Yes	Yes	Yes
Control for video used in fundraising campaign?	Yes	Yes	Yes	Yes
Control for amount of capital seeking?	Yes	Yes	Yes	Yes
Control for startup industry dummies?	Yes	Yes	Yes	Yes
Constant	8.399***	8.396***	8.453***	8.475***
	(11.78)	(11.84)	(12.00)	(12.05)
Number of observations	2497	2497	2497	2497
R^2	0.154	0.155	0.156	0.156

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

It is interesting to note, however, that after the Title III of JOBS Act, the average percentage of fundraising plan completed has reduced by 2.0%–3.3%[20], but the average amount of capital raised has increased by a significant 31.9%–45.2%, suggesting amplified fundraising discrepancies among equity crowdfunding start-ups after the Title III of JOBS Act: while more resources are available in the equity crowdfunding market, the capital is more concentrated on some startups, leaving other startups unfunded. This capital concentration in equity crowdfunding market after the Title III of JOBS Act can be an important research topic for future studies.

6. Robustness checks

We test different model specifications in evaluating the impact of qualitative business introduction on percentage of fundraising plan completed. The results are robust to different model specification and not reported for conciseness.[21]

It is worth noting that potential measurement error can bias multivariate analyses. Specifically, the length and percentage measurement on qualitative business information and usage of promotional language may not accurately reflect the amount of information delivered to crowdfunding investors. Entrepreneurs' expression habits and writing skills also influence the content of communication: depending on sentence structure, 200 words may convey the same information as 250 words. To account for potential measurement error, we use natural log transformed length of qualitative business information and natural log transformed

[20] We do not observe statistically significant change in fundraising targets after the Title III of JOBS Act.
[21] Results available upon request.

number of promotional words used in qualitative business description in analyses as robustness checks. The regression results, which are presented in Online Appendix Tables 3 and 4, show that the impacts of qualitative business information and usage of promotional language on equity crowdfunding outcomes are robust to measurements differences.

We further divide the observations into two groups based on whether a crowdfunding campaign has achieved its fundraising target. Start-ups that achieved fundraising targets are classified into the “treatment group”; those that did not, “control group”. The start-ups in the treatment group are then matched with start-ups in the control group based on the variables related to language usage in a start-up: number of managers, average education level of the management team and average industry experience of the management team. The matching process is based on propensity score matching (PSM), nearest-neighbor matching (NNM) or inverse probability weighted regression adjustment (IPWRA) method. The linguistic characteristics of entrepreneurs from fully funded start-ups (treatment group) are then compared with that of entrepreneurs from start-ups missing fundraising targets (control group). The matched sample analyses in Online Appendix Table 5 suggest that fully funded start-ups provide significantly more qualitative business information and use significantly less promotional language than start-ups missing fundraising targets, consistent with results in main tables.

Another concern on the analyses results is that the characteristics of startups could change after the adoption of Title III of JOBS Act: some types of firms that previously did not apply for crowdfunding, might decide to apply for funding knowing that the pool of investors now also contains retail investors that might be more willing to fund them.[22] In order to test for the potential change in startup characteristics after Title III of JOBS Act, we matched startups that went crowdfunding before Title III of JOBS Act with startups that went crowdfunding after the Title III of JOBS Act based on variables related to startup managerial characteristics, which directly determine the linguistic features of qualitative startup information provided in fundraising campaigns. For the matched sample with similar managerial conditions, we check startup characteristics in terms of age, revenue, equity retention ratio, R&D expense ratio, indication of planned exit channel and availability of startup evaluation prior to fundraising campaigns and find no statistically significant differences in startup characteristics after Title III of JOBS Act. The results are reported in Online Appendix Table 6.

7. Conclusion

Information asymmetry is widely documented in security offering. The information gap between entrepreneurs and investors enlarges when security offering qualification drops, market liquidity descends and media coverage retreats. To facilitate security offering, entrepreneurs have to mitigate the information gap through quality revealing.

This paper assesses quality signaling and receiving between entrepreneurs and investors in equity crowdfunding and analyzes the impact of effective communication on crowdfunding.

The data suggest that start-ups seeking equity crowdfunding disclose both quantitative and qualitative business information to investors. Specifically, quantitative information is data-driven: accounting records, managers' educational level and years of industry experience, estimated product market size and start-up value are all quantitative information. Qualitative information is description based, covering introductions on business model, competitive strategy, product market, drivers and barriers for product/service adoption and business milestones.

The data show that qualitative business introduction is effective in mitigating the information asymmetry between entrepreneurs and investors and strongly impacts equity crowdfunding outcome. In general, more detailed disclosure of qualitative information leads to better fundraising outcome.

The data reveal that sophisticated investors do not blindly accept qualitative information. They refrain from supporting start-ups that use excessive promotional language in business introductions. The ineffective promotional language is recognized by sophisticated investors as puffery in advertising due to lack of adequate factual support and results in increased investor skepticism. However, ordinary investors are much less resistant to promotional language and often associate it with entrepreneurs' ability and successfulness.

Overall, empirical evidence leads to the conclusion that when revealing firm quality, equity crowdfunding entrepreneurs effectively disclose qualitative information in addition to quantitative records to crowdfunding investors. In general, qualitative information is quality revealing because it reveals business characteristics not observable from quantitative records and provides investors an alternative channel to evaluate the underlying firm.

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Appendix A. Supplementary data

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References

Acharya, V.V., Pedersen, L.H., 2005. Asset pricing with liquidity risk. J. Financ. Econ. 77 (2), 375–410.
Ahlers, G.K.C., Cumming, D., Günther, C., Schweizer, D., 2015. Signaling in equity crowdfunding. Entrep. Theory Pract. 39 (4), 955–980.
Allison, T.H., McKenny, A.F., Short, J.C., 2013. The effect of entrepreneurial rhetoric on microlending investment: an examination of the warm-glow effect. J. Bus. Ventur. 28 (6), 690–707.
Allison, T.H., Davis, B.C., Short, J.C., Webb, J.W., 2015. Crowdfunding in a prosocial microlending environment: examining the role of intrinsic versus extrinsic cues. Entrep. Theory Pract. 39 (1), 53–73.
Allon, G., Bassamboo, A., Gurvich, I., 2011. "We Will Be Right with You": managing customer expectations with vague promises and cheap talk. Oper. Res. 59 (6), iii–1561.
Anglin, A.H., Short, J.C., Drover, W., Stevenson, R.M., McKenny, A.F., Allison, T.H., 2018. The power of positivity? The influence of positive psychological capital language on crowdfunding performance. J. Bus. Ventur. 33 (4), 470–492.
Baginski, S., Demers, E., Wang, C., Yu, J., 2016. Contemporaneous verification of language: evidence from management earnings forecasts. Rev. Acc. Stud. 21, 165–197.
Bergh, B.G.V., Reid, L.N., 2012. Effects of product puffery on response to print advertisements. Curr. Issues Res. Advert. 3 (1), 123–134.
Bergh, D.D., Connelly, B.L., Ketchen, D.J., Shannon, L.M., 2014. Signaling theory and equilibrium in strategic management research: an assessment and a research agenda. J. Manag. Stud. 51 (8), 1334–1360.
Bhattacharya, U., Krishnan, M., 1999. To believe or not to believe. J. Financ. Mark. 2 (1), 69–98.
Bodnaruk, A., Loughran, T., McDonald, B., 2015. Using 10-K text to gauge financial constraints. J. Financ. Quant. Anal. 50 (4), 623–646.
Bohliqa, A., 2015. A Study of the U.S. Intrastate Crowdfunding Exemptions. Portland International Conference on Management of Engineering and Technology (PICMET). pp. 961–967.
Bonardo, D., Paleari, S., Vismara, S., 2016. Valuing university–based firms: the effects of academic affiliation on IPO performance. Entrep. Theory Pract. 35 (4), 755–776.
Bonini, S., Capizzi, V., Giudici, G., 2018. The differential investment practices of crowd investors and business angels: a comparative analysis. (Working paper).
Capizzi, V., Carluccio, E.M., 2016. Competitive frontiers in equity crowdfunding: the role of venture capitalists and business angels in the early-stage financing industry. In: Bottiglia, R., Pichler, F. (Eds.), Crowdfunding for SMEs. Palgrave Macmillan Studies in Banking and Financial Institutions. Palgrave Macmillan, London.
Chakraborty, A., Harbaugh, R., 2014. Persuasive puffery. Mark. Sci. 33 (3), 315–461.
Connelly, B.L., Certo, S.T., Ireland, R.D., Reutzel, C.R., 2011. Signaling theory: a review and assessment. J. Manag. 37 (1), 39–67.
Crawford, V.P., Sobel, J., 1982. Strategic information transmission. Econometrica. 50 (6), 1431–1451.
Cumming, D., Johan, S., 2013. Demand driven securities regulation: evidence from crowdfunding. Venture Capital 15, 361–379.
Cumming, D., Leboeuf, G., Schwienbacher, A., 2019a. Crowdfunding. Keep-It-All vs. All-Or-Nothing. Financial Management, Models. https://doi.org/10.1111/fima.12262.
Cumming, D., Johan, S., Zhang, Y., 2019b. The role of due diligence in crowdfunding platforms. J. Bank. Financ. 108, 105661.
Cumming, D.J., Johan, S., 2019. Crowdfunding: Fundamental Cases, Facts, and Insights. Academic Press.
Danilov, A., Sliwka, D., 2017. Can contracts signal social norms? Experimental evidence. Manag. Sci. 63 (2), 279–585.
Davila, A., Foster, G., Gupta, M., 2003. Venture capital financing and the growth of start-up firms. J. Bus. Ventur. 18 (6), 689–708.
Diamond, D.W., Verrecchia, R.E., 1991. Disclosure, liquidity, and the cost of capital. J. Financ. 46 (4), 1325–1359.
Haan, P., Berkey, C., 2002. A study of the believability of the forms of puffery. J. Mark. Commun. 8 (4).
Heminway, J., Hoffman, S., 2010. Proceed at your peril: crowdfunding and the securities act of 1933. Tennessee Law Rev. 78, 879–972.
Hornuf, L., Neuenkirch, M., 2015. Pricing shares in equity crowdfunding. Small Bus. Econ. 48, 795–811 (2017).
Hornuf, L., Schwienbacher, A., 2018. Market mechanisms and funding dynamics in equity crowdfunding. J. Corp. Finan. 50, 556–574.
Kalay, A., 2015. Investor sophistication and disclosure clienteles. Rev. Acc. Stud. 20, 976–1011 (2015).
Kirmani, A., Rao, R.A., 2000. No pain, no gain: a critical review of the literature on signaling unobservable product quality. J. Mark. 64 (2), 66–79.
Kirsch, D., Goldfarb, B., Gera, A., 2009. Form or substance: the role of business plans in venture capital decision making. Strateg. Manag. J. 30 (5), 487–515.
Korajczyk, R.A., Lucas, D.J., McDonald, R.L., 1991. The effect of information releases on the pricing and timing of equity issues. Rev. Financ. Stud. 4 (4), 685–708.
Lang, M.H., Lundholm, R.J., 2000. Voluntary disclosure and equity offerings: reducing information asymmetry or hyping the stock? Contemp. Account. Res. 17 (4), 623–662.
Lin, M., Prabhala, N.R., Viswanathan, S., 2013. Judging borrowers by the company they keep: friendship networks and information asymmetry in online peer-to-peer lending. Manag. Sci. 59 (1), iv–264.
Loewenstein, G., Sunstein, C.R., Golman, R., 2014. Disclosure: psychology changes everything, annual review of economics. Vol. 6, 391–419.
Loughran, T., Mcdonald, B., 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. J. Financ. 66 (1), 35–65.
Loughran, T., Mcdonald, B., 2014. Measuring readability in financial disclosures. J. Financ. 69 (4), 1643–1671.
Loughran, T., Mcdonald, B., 2015. The use of word lists in textual analysis. J. Behav. Financ. 16 (1).
Loughran-McDonald Sentiment Word List, 2018. https://sraf.nd.edu/textual-analysis/resources/#LM%20Sentiment%20Word%20Lists.
Martens, M.L., Jennings, J.E., Jennings, P.D., 2007. Do the stories they tell get them the money they need? The role of entrepreneurial narratives in resource acquisition. Acad. Manag. J. 50 (5), 1107–1132.
McGrath, R.G., 1999. Falling forward: real options reasoning and entrepreneurial failure. Acad. Manag. Rev. 24 (1), 13–30.
Mollick, E., 2014. The dynamics of crowdfunding: an exploratory study. J. Bus. Ventur. 29 (1), 1–16.
Moore, J.J., Rodgers, S.L., 2005. An examination of advertising credibility and skepticism in five different media using the persuasion knowledge model. In: American Academy of Advertising Conference Proceedings, Lubbock, pp. 10–18.
Ozmel, U., Reuer, J.J., Gulati, R., 2012. Signals across multiple networks: how venture capital and alliance networks affect interorganizational collaboration. Acad. Manag. J. 56 (3).
Paravisini, D., Rappoport, V., Ravina, E., 2017. Risk aversion and wealth: evidence from person-to-person lending portfolios. Manag. Sci. 63 (2), 279–585.
Parhankangas, A., Renko, M., 2017. Linguistic style and crowdfunding success among social and commercial entrepreneurs. J. Bus. Ventur. 32 (2), 215–236.
Pietraszkiewicz, A., Soppe, B., Formanowicz, M., 2017. Go pro bono: prosocial language as a success factor in crowdfunding. Soc. Psychol. 48, 265–278.
Pollock, T.G., Chen, G., Jackson, E.M., Hambrick, D.C., 2010. How much prestige is enough? Assessing the value of multiple types of high-status affiliates for young firms. J. Bus. Ventur. 25 (1), 6–23.
Pownall, G., Waymire, G., 1989. Voluntary disclosure credibility and securities prices: evidence from management earnings forecasts. J. Account. Res. 27 (2), 227–245.
Rotfeld, H.J., Rotzoll, K.B., 2013. Is advertising puffery believed? J. Advert. 9 (3) (1980).
Signori, A., Vismara, S., 2018. Does success bring success? The post-offering lives of equity-crowdfunded firms. J. Corp. Finan. 50, 575–591.
Spence, M., 1973. Job market signaling. Q. J. Econ. 87 (3), 355–374.
Spence, M., 1974. Market Signaling: Informational Transfer in Hiring and Related Screening Processes. Harvard University Press.
Spence, M., 2002. Signaling in retrospect and the informational structure of markets. Am. Econ. Rev. 92 (3), 434–459.
Turan, S.S., 2015. Financial innovation - crowdfunding: friend or Foe? Procedia Soc. Behav. Sci. 195 (2015), 353–362.
Veciana, J.M., 2007. Entrepreneurship as a Scientific Research Programme. Entrepreneurship: Concepts, Theory and Perspective, 23–71 Information Cascades Among Investors in Equity Crowdfunding.
Vismara, S., 2018. Information cascades among investors in equity crowdfunding. Entrep. Theory Pract. 42 (3), 467–497.
Vismara, S., Paleari, S., Ritter, J.R., 2012. Europe's second markets for small companies. Eur. Financ. Manag. 18, 352–388.
Walthoff-Borm, X., Schwienbacher, A., Vanacker, T., 2018. Equity crowdfunding: first resort or last resort? J. Bus. Ventur. 33, 513–533.
Welker, M., 1995. Disclosure policy, information asymmetry, and liquidity in equity markets. Contemp. Account. Res. 11 (2), 801–827.