



Investor relations and IPO performance

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Abstract

We analyze the value of investor relations (IR) strategies to IPO firms. We find that firms that are less visible and have inexperienced management tend to hire IR consultants prior to the issue date. IR consultants help create positive news coverage before an IPO, as reflected in a more optimistic tone of published media. Their presence is associated with higher underpricing at the IPO date but with lower long-run returns. IR-backed IPOs also exhibit disproportionately higher insider-related agency problems, as IR-induced higher underpricing tends to occur primarily in IPOs where underwriter and venture capitalist agency conflicts are more severe. These findings suggest that the IR programs of IPO firm are mostly short-term oriented and facilitate the ulterior motives of some insiders (underwriters and venture capitalists) targeting higher first-day returns.

Keywords Initial public offering · Investor relations · Media · Agency problems · Underwriters · Venture capitalists · Analyst forecasts

JEL classification G12 · G14 · G30 · L82

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“Publicity is absolutely critical. A good PR story is infinitely more effective than a front-page ad.” — Richard Branson, founder of Virgin Group.

1 Introduction

In recent years, many private companies have hired investor relations (IR) firms—external consultants specializing in investor relations—to improve their visibility and ensure the success of their initial public offerings (IPO). Although nearly half of U.S. IPOs issued in 2016 involve IR consultants, little research examines IR activities in primary markets (Karolyi and Liao 2017), which are typically characterized by severe asymmetric information and agency problems (Liu and Ritter 2010; Ritter 2011). Our study fills this gap in the literature by examining the role, benefits, and costs of using IR consultants around an IPO and by analyzing how IR activities influence IPO mispricing that arises from agency problems.¹

There is mixed academic evidence on the role of IR consultants. According to Bushee and Miller (2012) and Kirk and Vincent (2014), seasoned firms that hire IR consultants benefit from improved media coverage and increased market valuations. However, consistent with the principal-agent problem between insiders (managers) and outsiders (potential investors), another stream of literature suggests that some firms use IR strategies opportunistically around certain important corporate events. For example, Hong and Huang (2005) argue that IR activities may lead to a divergence of interests between insiders and dispersed outside shareholders. They show theoretically that insiders could use IR activities to enhance the liquidity of their block shares before they unload those shares, rather than to correct long-run stock misvaluations. Furthermore, Solomon (2012) finds that IR consultants spin information about their clients to create more positive media coverage around corporate events. This yields momentary valuation improvements by enhancing market perceptions around preliminary earnings announcements, but these improvements reverse following actual earnings announcements.

An IPO event is an interesting setting to examine IR activities. Most private firms going public are small, risky, and little known. They also often lack expertise in communicating with investors and financial markets. Moreover, IPO firms are restricted by the quiet period, which prevents them from directly promoting their shares (Bradley et al. 2003).² IPO firms are also characterized by heterogeneous investor

¹ Although IPO firms may engage in IR activities using internal resources (e.g., through the CEO or an IR manager), we follow Solomon (2012) and focus on firms that use external IR consultants for this purpose. Small firms, such as typical IPO firms, are unlikely to have sophisticated IR departments and thus are more likely to rely on external IR consultants.

² During the IPO process, issuing firms are subject to a quiet period starting with the filing of the registration statement with the Securities and Exchange Commission (SEC). The quiet period ends when the SEC declares the statement effective. During this period, IPO firms are not allowed to advertise their equity offerings. However, research (e.g., Bradley et al. 2003) suggests that IPO firms still promote their shares during the quiet period, and third-party news articles appear during that period (Liu et al. 2014). We show that IR consultants who work for the IPO firms create a positive spin on some of these news articles. Hence our finding is in line with those of Bradley et al. (2003) in that some IPO firms find a way to promote their shares even during the quiet period and one of the benefits of hiring an external IR consultant appears to be circumventing such restrictions.

expectations (à la Miller 1977) and high degrees of value uncertainty (Derrien 2005; Ljungqvist et al. 2006), signifying the need for effective communication with outside investors. Our study provides new evidence on the conditions under which IPO firms hire IR consultants and the potential outcomes of such decisions. IR consultants could be a resource that supports less visible IPO firms and complements the missing skills of managers at the time of the public offerings. Indeed, we find that smaller and riskier IPO firms are more likely to hire IR consultants, as are those with lower CEO human capital (inexperienced CEOs).

How do IR consultants help? They engage in different public relations strategies to help firms manage relations with the financial media, arrange direct communications between firm managers and targeted institutional investors, and increase the quality and timeliness of corporate disclosures (Brennan and Tamarowski 2000; Bushee and Miller 2012). According to Wynne (2013), IR consultants write and distribute press releases, speeches, and pitches that are shared with journalists, and they organize special events for the media. They analyze their clients, find optimistic messages, and translate them into positive media stories. This allows IR consultants to provide their clients “with earned or free media— stories appearing on websites, newspapers, magazines, and TV programs—as compared to paid media or advertisements” (Wynne 2013). Given the limited economies of scale from developing an internal IR division within a young and relatively small firm, IR consultants can help issuing firms shape their communication plans toward investors, analysts, and the media, among others. According to BlueShirt Group, which specializes in IPO-related IR strategies, a main objective is to help in the IPO roadshow slide development, facilitate the offering on the “pricing day,” and prepare for the first earnings release and conference call (see Appendix A for more details). Note that not all IR consultants specialize in IPOs. For instance, Edelman, which ranks first in total U.S. revenues in 2012 (www.prweekus.com), is not in our sample of IR firms that specialize in consulting for IPOs.

Using a sample of 769 IPOs from 2006 to 2016, we find that IR consultants seem to have short-term roles and focus primarily on the successful completion of the event. Additionally, the IR-backed IPOs in our sample have higher IPO price revisions, higher first-day stock returns, and relatively better post-IPO market liquidity. We find that IR strategies are associated with more optimistic tone of media coverage and that this optimism is positively related to short-term IPO performance. All of our tests control for the endogeneity of hiring an IR consultant, and they show further robustness to controlling for the total number of news articles published about the IPO firm (Liu et al. 2014).

However, all these positive effects dissipate within a few quarters after the IPO event. Specifically, we find that the presence of IR consultants relates negatively to the one-year buy-and-hold abnormal returns following the end of the first day of trading. This event-driven improvement and post-IPO reversal in firm performance is consistent with the principal-agent problem between insiders (e.g., underwriters and venture capitalists) and other stakeholders. Indeed, we document that underwriter agency issues (Reuter 2006; Nimalendran et al. 2007; Liu and Ritter 2010, 2011; Chang et al. 2017) play a key role in the IR-related short-term outperformance (higher underpricing). Similarly, various venture capital-related conflicts of interests (Gompers 1996; Croce et al. 2015; Megginson et al. 2019) are also associated with IR programs employed by IPO firms. Collectively, these findings suggest that insiders (some underwriters and venture capitalists in particular) can use IR strategies to hype an issue to create highly

underpriced IPO shares, which then can be allocated to certain clients as favors (Liu and Ritter 2010; Ritter 2011). These are novel findings for the IPO literature, and they highlight the IR consultants' role in IPO hyping and the agency-related consequences of IR strategies.

In further investigations, we find that analysts issuing forecasts about the IR-backed IPOs right after the offering tend to have more optimistic expectations about these firms' earnings but that the actual post-IPO performances of these firms involve more frequent negative earnings reports. We also show that the investors who react favorably to such event-driven IR strategies are primarily individual investors and institutions that are small, unsophisticated, and inexperienced in IPO investing. Sophisticated large institutions are better at interpreting public information (e.g., news articles with positive spin), but individual investors and unsophisticated small institutions tend to misinterpret the relevance of such information (Field and Lowry 2009; Edelen et al. 2016). We further find that IPO firms that continue their relationships with IR consultants for a longer period perform better in the long-run, relative to those that do not. Moreover, a subset of IR-backed IPO firms with lower visibility but also lower investor uncertainty (Patatoukas et al. 2018) seem to rely less on short-term IR strategies and perform relatively better in the long run.

These findings point to a previously undocumented factor that affects the performance of IPO firms: IR strategies are an important driver of the short-term success of an IPO. These strategies are especially effective in firms that have severe agency issues (e.g., Liu and Ritter 2010, 2011; Chang et al. 2017) or high investor uncertainty (Patatoukas et al. 2018). Our results have implications for the investor relations literature, as we document that IR consultants have a different approach for bolstering IPO firms' ownership than seasoned firms do. Rather than focusing on the long-run institutional ownership of a seasoned stock (Bushee and Miller 2012; Kirk and Vincent 2014), IR strategies for IPO firms seem to be event-driven (Solomon 2012).

Finally, our study contributes also to growing literature that relates media coverage and investor recognition to stock prices (e.g., Tetlock 2007; Lehavy and Sloan 2008; Fang and Peress 2009; Engelberg and Parsons 2011; Gurun and Butler 2012) and that relates media coverage to IPO performance (e.g., Cook et al. 2006; Chemmanur and Yan 2009; Liu et al. 2014). We find that IR consultants are associated with a more optimistic tone in print media coverage, and this optimistic tone helps create short-term improvements in IPO performance around the offering date.

The next section discusses the related literature and our hypotheses. Section 3 presents our data and methodology. Section 4 provides our main results, and Section 5 conducts further investigations. Section 6 concludes.

2 Related literature and hypotheses

2.1 IR consultants and IPO performance: Do IR firms help?

IPOs are typically small and newly established firms whose managers have limited experience. Compared to large, mature firms, IPO firms usually lack expertise in investor relations, which might affect the success of their public offerings. Small firms are unlikely to have sophisticated internal investor relations departments. Hiring an

external IR consultant can address this shortcoming and help build relationships with investors and the financial media.

The literature examines many factors that affect IPO success. Such factors range from firm characteristics (Willenborg et al. 2015), to CEO human capital (Kaplan et al. 2012; Cadman and Sunder 2014), to the presence of sophisticated investors, such as venture capitalists (Jain and Kini 2000). There is also evidence that pre-IPO promotion efforts, including media coverage and product advertising, boost short-term (Benveniste and Spindt 1989; DuCharme et al. 2001; Cook et al. 2006; Chemmanur and Yan 2009) and long-term (Liu et al. 2014; Chemmanur and Yan 2017) IPO performance. Given the disclosure limitations imposed on IPO firms during the quiet period (Bradley et al. 2003), media coverage could contribute to the development of firm visibility and assessment of its value (Drake et al. 2014).

Considering that IPOs have very high failure costs (Dunbar 1998) and are generally characterized by asymmetric information problems, we argue that those firms that are small and “weak” (i.e., that have high failure risk) have strong incentives to hire IR consultants in order to succeed in their equity offerings rather than to correct long-term misvaluation (Hong and Huang 2005). Hence IR consultants are expected to focus on promoting equity offerings and increasing firm visibility around the offering date. This would ultimately influence investor behavior (Andreassen 1990) and increase IPO firms’ likeability among investors who tend to buy “attention-grabbing stocks” that are in the news (Barber and Odean 2002; Tetlock 2007; Barber and Odean 2008). These arguments comport with a stream of literature showing that media coverage influences investor demand (Huberman and Regev 2001; Tetlock 2007; Tetlock 2011; Gurun and Butler 2012; Chen et al. 2013; Ahern and Sosyura 2014; Hillert et al. 2014; Solomon et al. 2014).

Furthermore, through increasing the visibility of IPO firms, IR consultants could increase investor expectations, which in turn would lead to short-term upward pressure on stock prices (Cook et al. 2006; Cornelli et al. 2006; Ljungqvist et al. 2006). As a result, these IPOs would exhibit higher price revision, more underpricing, and better market liquidity (narrower bid-ask spread and higher trading volume), compared to other IPO firms.³

If the IR strategies of IPO firms are indeed short-term oriented and are focused primarily on the offering event, then stock underperformance in the long run should occur following a short-run outperformance. Hence IR-backed IPOs should have relatively low post-IPO stock returns, as asymmetric information about them dissipates (e.g., after releasing several 10-Q reports), and the information available to investors becomes more accurate.

Hypothesis 1. During the IPO event, the IR-backed IPOs will outperform other IPOs in the short run, but this outperformance will reverse in the long run.

³ The question of why not all the IPOs hire an external IR consultant is interesting. Several explanations can be formulated for this split in IPO firms’ behavior. First, some managers may fear that hiring an IR consultant violates the quiet-period rules. This can explain why mostly the “weak” IPOs, the ones with less to lose, tend to hire IR consultants. Many “solid” IPO firms may not want to take such a legal risk. Second, because in the long run the returns from hiring IR consultants reverse and turn negative, some insiders may not be willing to alienate their investor clientele for short-term gains. Third, hiring an IR consultant is a fairly new practice, and it is growing in popularity. Our study is the first to shed light on this practice in the IPO markets. Thus it is likely that some IPO firms are simply unaware of the short-term benefits of hiring an IR consultant.

2.2 IR consultants and the tone of media news: how do IR firms help?

Studies show that firms manage the tone of their earnings releases and other disclosure forms with the intent to influence investor reaction (e.g., Tetlock 2007; Davis and Tama-Sweet 2012; Huang et al. 2014; Brochet et al. 2015). For example, Loughran and McDonald (2013) report that the tone of S-1 forms filed by IPO firms, in terms of its definitiveness and clarity, affects first-day returns, absolute offer price revisions, and subsequent stock price volatility. Similarly, using the linguistic tone of the press release around earnings announcements, Solomon (2012) finds that IR consultants increase the amount of positive media coverage about their clients relative to negative news, which he refers to as the spin hypothesis. He argues that, if investors face costs and difficulties in processing news and use media reports when forming expectations, then more positive coverage may cause investors to bid up the price.

An IR consultant might thus use positive tone of the news articles as a way to influence investor reaction around the IPO date. However, as in Solomon (2012), the effect of such positive spin is likely short-lived and may be associated with lower long-term performance (i.e., stock price reversal). Hence we hypothesize that IR consultants spin their clients' news and use optimistic tone of media coverage as a channel to promote IPOs and influence their short-term performance.

Hypothesis 2. Compared to other IPOs, IR-backed IPOs have more optimistic tone in news articles, and this optimistic tone is positively (negatively) related to short-term (long-term) IPO performance.

2.3 IR consultants and agency conflicts: insiders' motives to employ IR strategies

In our next hypothesis, we investigate whether short-term IPO outperformance via IR strategies is associated with agency conflicts related to IPO insiders, such as underwriters and venture capitalists. Underwriters may have ulterior motives during an IPO (Liu and Ritter 2010; Chang et al. 2017; Chiang et al. 2018), and, as a result, they may have incentives to push for short-term hype in the form of higher underpricing. This would allow conflicted or self-interested underwriters to allocate underpriced IPO shares as a favor to preferred clients to generate short-term gains (Reuter 2006; Nimalendran et al. 2007; Liu and Ritter 2011). Underwriters reportedly apply many selfish (hying) strategies that, in one form or another, involve distorted first-day returns. Some of those strategies include IPO spinning (Loughran and Ritter 2004; Liu and Ritter 2010), laddering (Hao 2007), favorable analyst coverage (Cliff and Denis 2004; Dambra et al. 2018; Jia et al. 2018; Qian et al. 2018), and exchanging soft-dollar commission business in return for IPO allocation (Reuter 2006). Thus, it is likely that some underwriters could exploit the IR strategies for ulterior motives. Because underwriters are key players during the pre-IPO period, we argue that self-interested underwriters are likely to be associated with IR strategies that result in higher IPO underpricing at the expense of lower long-run performance.

Similarly, certain venture capitalists may also be prone to selfish strategies that can result in IPO mispricing. We postulate that young venture capitalists, which tend to grandstand (Gompers 1996), and unaffiliated venture capitalists, which have more pressure to seek additional funding and thus are willing to tolerate risky IPOs that

occur too early (Croce et al. 2015; Megginson et al. 2019), are more likely to be associated with venture capitalist-related agency conflicts. We thus hypothesize that conflicted venture capitalists are more likely to be associated with IR strategies that result in higher IPO underpricing and lower long-run performance.

Hypothesis 3a. IR strategies applied during an IPO event are more likely to be associated with underwriter-related agency conflicts.

Hypothesis 3b. IR strategies applied during an IPO event are more likely to be associated with venture capitalists-related agency conflicts.

3 Data, variables, and methodology

3.1 Sample

Our IPO data comes from the Securities Data Corporation (SDC) New Issues database for the period of 2006 to 2016. Out of the entire population of 1411 U.S. IPOs during that period, we exclude 182 IPOs that are units, REITs, and other special investment vehicles. Consistent with the IPO-pricing literature, we exclude 102 IPOs for which the offer price is less than \$5 and 197 IPOs that are in the financial sector (e.g., Ritter and Welch 2002; Blankespoor et al. 2017; Slatten et al. 2018). To identify whether an IPO firm hires an IR consultant prior to the issuance date, we examine whether the IPO announcement includes an IR consultant as a contact.⁴ Out of the remaining 930 IPOs, we exclude 40 IPOs for which we could not identify the contact party in the IPO announcement. This leaves us with 890 IPOs from which we exclude 121 IPOs without enough historical data from their prospectuses (e.g. no historical data on sales). Our final sample consists of 769 IPOs, for which we retrieve financial data from the IPO prospectuses; stock prices and market liquidity data are from the CRSP database.⁵

During the sample period (2006–2016), the proportion of IR-backed IPOs steadily rises from 0.179 in 2006 to 0.480 in 2016; an increase of 168% in 11 years. This suggests a substantial increase in the popularity of IR programs among recent IPOs in the United States. As far as the industry distribution, the sample IPOs are more concentrated in manufacturing and personal, business, and recreation services (SICs 2, 3, and 7).⁶

⁴ Please see our online appendix for an example of a press release related to the IPO announcement of Biocept Inc. (<https://www.cnbc.com/2014/02/04/globe-newswire-biocept-inc-announces-pricing-of-initial-public-offering.html>).

⁵ Our final sample involves 64 different IR consultants, led by ICR and Blueshirt, which consulted a significant portion (around 18%) of our sample IPOs (86 and 53 IPOs, respectively). In a related robustness test, we remove the IPOs consulted by these two IR firms and rerun our main analyses in Table 2. Our conclusions regarding IR consultants' effect on underpricing and BHAR do not change. Thus these findings do not appear to be consultant-specific, and they hold for the general sample of IR consultants.

⁶ In untabulated results, we find that during the sampling period there is no significant time trend in our post-market IPO performance measures (underpricing, price revision, bid-ask spread, and trading volume). Please see the online appendix for more details on the year and industry distribution.

3.2 Primary variables

Appendix B formally defines all of our variables. Below we describe the key variables used in the analyses.

3.2.1 IPO performance

To gauge the performance of an IR-backed IPO in the immediate aftermarket period (the first few days after the offering), we use IPO underpricing as well as two proxies for market liquidity: bid-ask spread and trading volume. *Underpricing* is the ratio of the difference between the closing price on the first day of trading and the offer price divided by the offer price (Lowry and Shu 2002; Bradley et al. 2004; Li and Liu 2017). *Bid-Ask Spread* is the average daily closing spread ((bid-ask)/midpoint of the price range) during the one-month period following the end of the first day of trading, and *Trading Volume* is the average number of shares traded daily during the one-month period following the end of the first day of trading.

We also consider *Price Revision* (the percentage change between the mid-price of the initial price range and the offer price) observed after the roadshows as an indirect measure of whether and by how much the cost of capital increases or decreases after the information from the initial investor demand is incorporated into the offer prices.

We measure long-run aftermarket performance of an IPO using the buy-and-hold abnormal return, *BHAR*, over the one year (12 months) following the event. The buy-and-hold abnormal return is adjusted using the value-weighted CRSP index.⁷

3.2.2 IR consultant

Our main explanatory variable, *IR Consultant*, equals 1 for IR-backed IPOs and zero otherwise. In further investigations, we measure IR consultant reputation, *IR IPO Reputation*, based on decile ranking of the total market capitalization of IPOs that the IR consultant was involved in during the last three years prior to the current IPO date.⁸ The majority of our IPOs did not engage an IR consultant, which makes their IR consultant reputation not calculable. For these IPOs, we assign a value of zero as their *IR IPO Reputation*. If an IPO has an IR consultant, the lowest value of *IR IPO Reputation* is 1 and the highest is 10. Further details about construction of this variable are in the online appendix.

3.2.3 Net optimism and tone in the media

To measure *Net Optimism*, we calculate the tone of media coverage using DICTION, which is a textual-analysis dictionary-based software that counts words characterized

⁷ For robustness, we run our tests for long-run aftermarket performance, using either a calendar-time portfolio approach or the alpha of the Fama-French-Carhart four-factor model as a measure of returns. Our qualitative conclusions are unaffected when we use these alternative methods of calculating long-run returns.

⁸ Similar analyses evaluate how the certification of high-reputation underwriters (Carter et al. 1998) and high-reputation venture capitalists (Krishnan et al. 2011) affect IPO performance. To analyze the impact of IR reputation on IPO performance, we closely follow these studies. See the online appendix for further information.

by linguistic theory (Hart 2000, 2001). For each IPO, all media coverage of the IPO is from Lexis-Nexis during the 90 days prior to the IPO date. We focus on news during the 90 days prior to the offer date because older news is less likely to affect performance at the time of the IPO. Specifically, we first upload the list of positive and negative words as classified by Loughran and McDonald (2011, 2016) into DICTION.⁹ We then subtract the percentage of negative or pessimistic words from the percentage of positive or optimistic words, relative to the total number of words in a given media article.

3.2.4 Underwriter agency score

We expect self-interested underwriters to have a persistent effect on underpricing, thus reflecting an intrinsic incentive to underprice public offerings over time (Hoberg 2007). This implies a positive association between the underpricing of the current IPO and the underpricing of previous IPOs underwritten by the same underwriter. Thus, the dummy variable *High Previous Underpricing* measures the average underpricing induced by an underwriter in the previous three years and compares it to that of other underwriters; if it is above (below) the median, *High Previous Underpricing* takes a value of 1 (zero).

In line with the work of Chang et al. (2017), we also expect self-interested underwriters to push issuers to leave more money on the table (i.e., create higher underpricing), which will make the issuer more likely to return to the financial markets to issue additional shares. This suggests a positive association between IPO underpricing and the ex-post occurrence of a security issuance by the IPO firm during the two years following the IPO. The dummy variable *Issue Again* equals 1 if the firm has at least one seasoned-equity offering (SEO) in the next two years and zero otherwise. To create this variable, we collect data from the EIKON-Thomson database on SEOs and check which IPO firms conduct subsequent equity offerings within 24 months of their IPO dates.

We create a combined underwriter agency conflict score (*UW Agency Score*), which is the sum of two dummy variables borrowed from Chang et al. (2017): *Issue Again* and *High Previous Underpricing*. *UW Agency Score* ranges from 0 to 2, depending on the values of the corresponding dummy variables. This score captures the severity of underwriter agency conflicts from two separate angles: the underwriter's prior tendency to underprice and the issuer's lack of negotiating power, given its needs for more cash in the future.

3.2.5 Venture capitalist agency score

We expect young and unaffiliated venture capital firms to face greater conflicts of interests when taking their portfolio companies public. Younger venture capitalists tend to grandstand and push for early and underpriced offerings to establish a reputation quickly and then raise capital for new funds (Gompers 1996). Similarly, compared to captive (or affiliated) venture capitalists supported by parent companies, independent venture capitalists often need to raise cash through frequent fund-raising campaigns,

⁹ The lists of words classified into various categories (negative, positive, uncertainty, etc.) are available at Notre Dame Software Repository for Accounting and Finance (<https://sraf.nd.edu/textual-analysis/resources/#LM%20Sentiment%20Word%20Lists>).

which they facilitate through high risk tolerance and pursuing higher capital gains (Croce et al. 2015; Megginson et al. 2019).

To measure venture capitalist age, we calculate the difference between the venture capital fund's founding date (available in VentureXpert database) and IPO issuance date. We then divide the age distribution of all venture capital funds in our sample into terciles. Not all IPOs are venture capital-backed, and naturally the non-venture capital-backed IPOs are expected to be free of venture capital-related agency problems. Thus, to create proper scaling, our newly created score variable *Young VC* equals zero for such IPOs. When an IPO is associated with a venture capitalist that is not young (i.e., second and third terciles), then *Young VC* equals 1. When the venture capitalist age is in the first tercile, *Young VC* is 2.

Following prior studies (e.g., Croce et al. 2015; Megginson et al. 2019), we split the venture capital-backed IPOs sample into firms backed by captive venture capitalists and those supported by independent ones. A venture capitalist is classified as independent if it is not affiliated with any other institution (manufacturing firms, hedge funds, investment banks, etc.).¹⁰ Similar to *Young VC*, we create *Independent VC*, which equals zero (the IPO firm is not backed by any venture capitalist), 1 (the syndicate involves at least one affiliated venture capitalist), or 2 (the syndicate is composed entirely of independent venture capitalists).¹¹

VC Agency Score is a combined venture capitalist agency conflict score that equals zero (no venture capital support), 1 (the venture capitalist is neither young nor independent), 2 (the venture capitalist is either young or independent but not both), and 3 (the venture capitalist is both young and independent).

3.3 Methodology

The choice to hire an IR consultant is not exogenous. The study of the impact of IR consultants on IPO performance should therefore control for the IPO firm's endogenous decision to hire an IR consultant. To test our first hypothesis on the association between IR consultant and IPO performance, we use an instrumental variables approach, which is consistent with the work of Karolyi and Liao (2017). We identify the following three instruments as the most appropriate in our IPO context. *Cohort IR* captures the IR efforts of recent IPO firms (all IPOs conducted during the year prior to the current IPO's issue date). Such efforts would likely induce a private firm contemplating an IPO to hire an IR consultant. *Advertising Expenses of Seasoned Firms* (average advertising expenses as a percentage of sales for all publicly listed seasoned firms within the Compustat database during the last fiscal year prior to the IPO date) is relevant, because advertising and IR publicity are complements or substitutes. *CEO Experience in Marketing and Sales* (a dummy variable that equals to 1 if the CEO has a managerial experience or a degree in marketing or sales and zero otherwise) captures CEO's

¹⁰ An example of an affiliated venture capitalist is Intel Capital fund, a division of Intel Corp., the chip manufacturer.

¹¹ We hand-collect the list of all venture capitalists from the IPO prospectuses, and we then retrieve data on their characteristics from VentureXpert database.

positive attitude toward and familiarity with various marketing techniques, which can affect a firm's desire to engage an IR consultant.¹²

In the first-stage regressions, we include various IPO and CEO characteristics, because we expect that these characteristics may influence the decision to hire an IR consultant. We also include industry and year fixed effects in all of our regressions. Our two-stage least squares (2SLS) model is as follows.

$$IR\ Consultant = \alpha_0 + \alpha_1 Instruments\ for\ IR + \alpha_2 Controls + \varepsilon \quad (1a)$$

$$IPO\ Performance = \beta_0 + \beta_1 IR\ Consultant + \beta_2 Controls + \eta \quad (1b)$$

To test our second hypothesis on the association between the tone of news coverage and IPO performance, we use a three-stage least squares (3SLS) model and examine whether IR consultants use an optimistic tone as a channel to influence IPO performance. Hence, we add an equation to the 2SLS model with *Net Optimism* as the dependent variable and *IR Consultant* and the same set of control variables as independent variables. This additional equation essentially estimates the extent to which publicity about an IPO firm, as captured by the tone of the news articles, is significantly better when the firm uses an IR consultant after controlling for other factors. In this equation, we also include a new instrument for *Net Optimism*, *Proportion of Local Media*, measured as the proportion of news articles published by the local media, relative to the total number of news articles. Gurun and Butler (2012) find that local media outlets publish articles that have a more positive slant, and thus this instrument should directly affect *Net Optimism* (relevance criterion). Furthermore, this instrument would also satisfy the exclusion criterion, because the local media can influence a local firm's valuations only through positive news coverage (i.e., only through *Net Optimism*).¹³ We instrument *IR Consultant* with the previously described three instruments (*Cohort IR*, *CEO Experience in Marketing and Sales*, and *Advertising Expenses of Seasoned Firms*). Our 3SLS model is as follows.

$$IR\ Consultant = \alpha_0 + \alpha_1 Instruments\ for\ IR + \alpha_2 Controls + \varepsilon \quad (2a)$$

$$Net\ Optimism = \gamma_0 + \gamma_1 Instrument\ for\ Net\ Optimism + \gamma_2 IR\ Consultant \\ + \gamma_3 Controls + \mu \quad (2b)$$

¹² In our case, each of the three instruments arguably satisfies both the relevance and the exclusion criteria. For example, because *Cohort IR* captures the investor relations efforts of recent IPO firms, it is likely that such efforts would induce a private firm contemplating an IPO to hire an IR consultant (relevance criterion), but such external efforts by other firms should not affect our firm's IPO performance through any other means but the IR consultants' efforts (exclusion criterion). Similar arguments apply for the other instruments. Note that using several instruments for one endogenous variable is a desirable procedure in 2SLS regressions, because it creates over-identified conditions. Even if one of the instruments is deemed irrelevant, the remaining instruments are sufficient for proper identification (see Wooldridge (2002), Section 5.1.2).

¹³ It is unlikely that there are alternative channels through which the local media can help local firms. For example, a local media outlet cannot loan local firms cheap capital or provide more effective managerial consulting services. The only help it can provide is to improve a local firm's image and increase local residents' familiarity with firm through publishing more positive news articles about it. Put differently, local media impacts firm valuations exclusively through the optimism (*Net Optimism*) of their published articles.

$$IPO\ Performance = \delta_0 + \delta_1 Net\ Optimism + \delta_2 Controls + \nu \quad (2c)$$

Controls is a vector of control variables that are commonly used in the IPO literature (e.g., Loughran and Ritter 2004; Gao et al. 2013; Willenborg et al. 2015; Xiao and Yung 2015; Bajo et al. 2016; Fedyk et al. 2017). These control variables are presented hereafter in the descriptive statistics subsection and are defined in more detail in Appendix B.

3.4 Descriptive statistics

Table 1 reports the mean, median, and standard deviation for the variables used in our study. All continuous variables are winsorized at the 1% and 99% percentiles. About 33.2% of the IPO firms in our sample hired IR consultants prior to the IPO date. The mean reputation of IR consultants is 2.2 (the highest possible reputation score is 10). An average (median) IPO firm has 10.36 (4) media articles during the 90 days prior to the IPO date, and *Net Optimism* of these articles is negative and equal to -0.601% . CEO human capital (*CEO HC*) is around 1 on a scale of 5, which indicates that most CEOs of IPO firms do not have sufficient human capital (experience). In addition, 27.2% of CEOs in our sample are founders, and 51.5% of IPOs are venture capital-backed. The means of *Price Revision* and *Underpricing* are -2.3% and 15.7% , respectively. For the market liquidity proxies, the mean bid-ask spread and trading volume during the month following the end of the first day of trading are 0.007 and 0.008, respectively. The buy-and-hold abnormal return over the year following the end of the first day of trading (BHAR) is -1.1% . The rest of the variables have properties similar to a typical IPO sample used in the literature.

Furthermore, Table 1 reports the mean differences between the subsamples of IPOs with IR support and the ones without. Statistics show that underpricing, bid-ask spread, and trading volume are significantly higher in IR-backed IPOs, relative to other IPOs. In addition, the buy-and-hold abnormal return over the year following the end of the first day of trading is significantly lower in IR-backed IPOs, relative to other IPOs. Furthermore, *Net Optimism* is significantly greater in IR-backed IPOs, and on average it is positive, suggesting that IR consultants are associated with a higher proportion of positive words used during the news coverage of their clients.

The results in Table 1 also point to an important distinction between IR-backed IPO firms and other IPO firms. The former are smaller, younger, and concentrated in the high-tech and internet industries. In addition, they are more likely to be venture capital-backed and listed on the NASDAQ. They are also associated with lower-reputation underwriters. IPOs that have losses (used IPO proceeds to reduce debt) are more (less) likely to hire IR consultants. IR-backed IPOs have CEOs with lower human capital. Thus “weaker” IPOs are more likely to be associated with an IR consultant.¹⁴ This finding is further supported by the significantly higher *DO Score*, a measure of riskiness, of these IR-backed IPOs. IR-backed IPOs are more likely to go public during hot periods than non-IR backed IPOs. IR-backed IPOs also have higher insider-participation ratios (fraction of old shares sold by the

¹⁴ In a separate analysis, we find that there are 470 withdrawn IPOs during 2006–2016 that fit our sample selection criteria (see Section 3.1). Only 4.47% of those withdrawn IPOs had IR consultants, and the majority of these IR consultants are small or not reputable. Thus, with a lack of meaningful IR support and given unfavorable market conditions (usually announced in the withdrawal report), these already fledgling IPO firms had no choice but to withdraw. This indirectly supports our claim that IR consultants provide valuable services during the IPO event, and the lack of these services can turn a weak IPO into a failed one.

Table 1 Descriptive statistics

	Entire sample				With IR (N = 255)			Without IR (N = 514)			P-value of Diff
	Mean	Median	s.d.		Mean	Median	s.d.	Mean	Median	s.d.	
<i>The main variables</i>											
<i>IR Consultant</i>	0.332	0.000	0.471								
<i>IR IPO Reputation</i>	2.200	0.000	3.820								
<i>Cohort IR</i>	0.356	0.388	0.146	0.400	0.432	0.135	0.334	0.296	0.146	0.000***	
<i>Advert Expenses Seasoned Firms</i>	0.096	0.076	0.056	0.101	0.091	0.054	0.094	0.063	0.056	0.073*	
<i>CEO Exper. Market and Sales</i>	0.291	0.000	0.455	0.380	0.000	0.486	0.247	0.000	0.432	0.000***	
<i>Net Optimism</i>	-0.601	0.000	3.767	0.577	0.000	3.227	-1.186	-0.190	3.881	0.000***	
<i>Proportion of Local Media</i>	0.109	0.000	0.221	0.135	0.000	0.268	0.096	0.000	0.193	0.022**	
<i>Performance measures</i>											
<i>Price Revision</i>	-0.023	0.000	0.142	-0.017	0.000	0.144	-0.026	0.000	0.141	0.385	
<i>Underpricing</i>	0.157	0.094	0.244	0.223	0.177	0.279	0.125	0.073	0.218	0.000***	
<i>Bid-Ask Spread</i>	0.007	0.004	0.006	0.007	0.005	0.007	0.006	0.004	0.006	0.019**	
<i>Trading Volume</i>	0.008	0.006	0.007	0.008	0.006	0.009	0.007	0.006	0.006	0.015**	
<i>BHAR</i>	-0.011	-0.097	0.576	-0.141	-0.260	0.544	0.053	-0.048	0.581	0.000***	
<i>Insiders-related variables & IPO characteristics</i>											
<i>CEO HC</i>	0.966	1.000	0.981	0.780	1.000	0.909	1.058	1.000	1.003	0.000***	
<i>CEO Founder</i>	0.272	0.000	0.445	0.306	0.000	0.462	0.255	0.000	0.436	0.135	
<i>Equity Offer Size</i>	0.258	0.241	0.124	0.249	0.233	0.112	0.263	0.244	0.130	0.152	
<i>Participation Ratio</i>	0.174	0.000	0.274	0.208	0.029	0.290	0.157	0.000	0.265	0.015**	
<i>VC</i>	0.515	1.000	0.500	0.647	1.000	0.479	0.449	0.000	0.498	0.000***	
<i>Underwriter Reputation</i>	8.116	9.000	1.769	7.669	8.500	2.023	8.337	9.000	1.585	0.000***	
<i>Number of News</i>	10.362	4.000	23.928	7.024	4.000	12.930	12.018	5.000	27.679	0.006***	

Table 1 (continued)

	Entire sample			With IR (N = 255)			Without IR (N = 514)			P-value of Diff
	Mean	Median	s.d.	Mean	Median	s.d.	Mean	Median	s.d.	
<i>DO Score</i>	0.508	0.667	0.354	0.597	0.667	0.328	0.464	0.333	0.358	0.000***
<i>Market Cap</i> (in \$mil)	914.893	426.226	1568.185	527.467	364.110	556.647	1107.098	492.042	1848.398	0.000***
<i>Small Sales</i>	0.328	0.000	0.470	0.357	0.000	0.480	0.313	0.000	0.464	0.225
<i>Sales Growth</i>	1.135	0.285	3.899	0.938	0.316	2.991	1.233	0.271	4.278	0.324
<i>Firm Age</i>	15.021	9.230	17.612	12.813	10.000	10.486	16.117	9.000	20.157	0.014***
<i>Hi-tech</i>	0.501	1.000	0.500	0.584	1.000	0.494	0.459	0.000	0.499	0.001***
<i>Internet</i>	0.129	0.000	0.335	0.184	0.000	0.389	0.101	0.000	0.302	0.001***
<i>ROA</i>	-0.082	0.071	0.438	-0.155	0.024	0.513	-0.046	0.081	0.390	0.001***
<i>Loss</i>	0.521	1.000	0.500	0.604	1.000	0.490	0.481	0.000	0.500	0.001***
<i>R&D</i>	0.145	0.052	0.231	0.202	0.105	0.290	0.116	0.017	0.189	0.000***
<i>Deleverage</i>	0.594	1.000	0.491	0.529	1.000	0.500	0.626	1.000	0.484	0.010***
<i>NASDAQ</i>	0.620	1.000	0.486	0.753	1.000	0.432	0.554	1.000	0.498	0.000***
<i>Market Return</i>	0.037	0.040	0.058	0.033	0.039	0.057	0.039	0.043	0.058	0.164
<i>Hot IPO Market</i>	0.495	0.000	0.500	0.569	1.000	0.496	0.459	0.000	0.499	0.004***

This table reports the mean and standard deviation for the variables in our analysis for the entire sample of 769 IPOs. All the continuous variables are winsorized at the 1% and 99% levels. All variables are defined in Appendix B. ***, **, and * denote statistical significance at the 1%, 5% and 10% levels, respectively

existing shareholders during the IPO), suggesting that insiders prefer to exit their investments during the IPO.

4 Results

4.1 Performance of IR-backed IPOs

Model (1a) of Table 2 presents the results from the first-stage logit regression that estimates the determinants of hiring an IR firm (i.e., Eq. 1a). The data fit the model quite well. A Wald χ^2 test on whether the coefficient estimates are jointly zero is significant with p value less than 0.1% and Pseudo R^2 equal to 0.265. We find that the likelihood of hiring an IR consultant is positively related to *Cohort IR*, *Advertising Expenses of Seasoned Firms*, and *CEO Experience in Marketing and Sales* at the 1% level. Furthermore, IPO firms that are smaller (i.e., less visible), riskier (*DO Score*), R&D intensive, of lower equity offer size, and managed by CEOs with lower human capital are more likely to hire IR consultants.¹⁵ The results further indicate that IPO firms are more likely to hire IR consultants when the participation ratio is higher (i.e., the fraction of the IPO proceeds that is sold by existing shareholders is higher). The involvement of an IR consultant is also more likely for firms going public following a period of lower market returns and when IPOs are venture capital-backed, listed on the NASDAQ, and have less reputable underwriters.¹⁶

Models (2a) to (6a) in Table 2 report the results of the second-stage regression in Eq. (1b) for the association between *IR Consultant* and IPO performance, after considering for the endogenous choice of hiring IR consultants and after controlling for other variables that could affect IPO performance (e.g., Hanley 1993; Loughran and Ritter 2002; Lowry and Murphy 2007; Yung et al. 2008). As hypothesis 1 predicts, *IR Consultant* is positively related to *Price Revision*. Also, the presence of IR consultants is associated with higher *Underpricing* and higher market liquidity. Specifically, *IR Consultant* is positively related to *Trading Volume* and negatively related to *Bid-Ask Spread*. Furthermore, model (6a) shows that *IR Consultant* is negatively related to *BHAR* at the 1% significance level. These results provide further support to our first hypothesis. In terms of economic significance, relative to other IPOs, IR-backed IPOs have on average higher *Price Revision*, *Underpricing*, and *Trading Volume* by 1.1%, 4.9%, and 0.2%, respectively, and lower *Bid-Ask Spread* and *BHAR* by 0.1% and 21.5%, respectively.¹⁷

Table 2 reports the Sargan's χ^2 test of over-identifying restrictions to assess whether our three instrumental variables (*Cohort IR*, *CEO Experience in Marketing and Sales*, and *Advertising Expenses of Seasoned Firms*) are correlated with the error term (or the residual)

¹⁵ When we decompose *CEO HC* measure (a la Pollock et al. 2009) into its components (see Appendix B), we find that CEOs with lower former CEO experience and those with lower former managerial experience (as a top management team member of any public firm) are more likely to hire IR consultants. Results are available upon request.

¹⁶ Our data exhibits limited variations in the lockup period. The data shows that 742 of 769 IPOs in our sample have a lockup period of 180 days, and the average lockup period is 179.62 days. We thus remove the lockup period from our list of control variables.

¹⁷ In untabulated tests, we find that IR consultants are associated with lower relative valuations (measured by price-to-book ratio), which implies lower costs of capital for IR-backed IPOs. See Kim and Ritter (1999), Purnanandam and Swaminathan (2004), and Colak et al. (2017) for details on how valuation ratios relate to implied cost of capital paid by IPO firms. Results are available upon request.

Table 2 IR consultants and IPO performance

	Panel A: Using IR Consultant					
	(First-Stage)			(Second-Stage)		
	IR Consultant	Pricing at Offer	Aftermarket Performance			BHAR (1 Year)
			Price Revision	Underpricing	Bid-Ask Spread	
(1a)	(2a)	(3a)	(4a)	(5a)	(6a)	
Constant	-2.645	-0.305	-0.025	0.031	-0.005	-0.084
	2.312	0.144	0.226	0.005	0.008	0.614
<i>IR Consultant</i>		0.011*	0.049***	-0.001*	0.002***	-0.215***
		0.006	0.018	0.000	0.001	0.048
<i>Cohort IR</i>	6.815***					
	2.510					
<i>Advertising Expenses Seasoned Firms</i>	35.920***					
	13.679					
<i>CEO Exper. Marketing and Sales</i>	0.571***					
	0.206					
<i>Price Revision</i>			0.701***			
			0.058			
<i>CEO HC</i>	-0.326***	-0.003	-0.002	0.000	-0.001*	-0.011
	0.112	0.005	0.008	0.000	0.000	0.023
<i>CEO Founder</i>	-0.215	0.005	0.020	0.000	0.001	0.074
	0.222	0.011	0.017	0.000	0.001	0.048
<i>Equity Offer Size</i>	-1.549*	0.032	-0.198***	-0.002*	0.011***	-0.566***
	0.932	0.045	0.070	0.002	0.002	0.191
<i>Participation Ratio</i>	1.755***	-0.005	-0.074**	0.000	-0.002*	0.132
	0.395	0.019	0.030	0.001	0.001	0.082
<i>VC</i>	0.529**	0.049***	0.051**	0.000	0.001	-0.030
	0.267	0.013	0.021	0.000	0.001	0.057
<i>Underwriter Reputation</i>	-0.211***	-0.008**	0.009*	-0.001***	0.000	0.042***
	0.064	0.003	0.005	0.000	0.000	0.014
<i>Number of News</i>		0.000	0.001**	0.000*	0.000***	-0.001
		0.000	0.000	0.000	0.000	0.001
<i>DO Score</i>	1.116**	0.107***	0.083**	-0.001	0.004***	-0.016
	0.515	0.025	0.040	0.001	0.001	0.108
<i>Log (Market Cap)</i>	-1.110***	0.115***	-0.019	-0.006***	0.003***	-0.195***
	0.345	0.016	0.026	0.001	0.001	0.067
<i>Small Sales</i>	-0.764***	0.022	-0.008	0.001**	0.000	-0.062
	0.293	0.014	0.022	0.000	0.001	0.061
<i>Sales Growth</i>	0.001	-0.002	0.000	0.000	0.000	-0.011**
	0.030	0.001	0.002	0.000	0.000	0.005
<i>Log (Firm Age)</i>	0.246	-0.018	0.026	0.000	0.000	-0.011
	0.298	0.013	0.021	0.000	0.001	0.058
<i>Hi-tech</i>	-0.163	-0.012	-0.032	0.001***	-0.001	0.031
	0.261	0.013	0.020	0.000	0.001	0.055
<i>Internet</i>	0.447	0.005	0.026	0.000	0.001	0.039
	0.305	0.016	0.026	0.001	0.001	0.071
<i>ROA</i>	0.092	0.019	0.061***	-0.001***	0.002*	-0.011
	0.274	0.015	0.023	0.001	0.001	0.063
<i>Loss</i>	-0.128	-0.043***	-0.014	0.000	-0.001	-0.113*
	0.310	0.015	0.023	0.001	0.001	0.063
<i>R&D</i>	0.967*	-0.051*	0.111**	-0.001	-0.001	-0.081
	0.552	0.028	0.044	0.001	0.002	0.121
<i>Deleverage</i>	0.258	-0.009	0.023	0.000	0.000	0.065
	0.218	0.011	0.017	0.000	0.001	0.046
<i>NASDAQ</i>	0.804***	-0.004	0.042**	0.002***	0.000	0.023
	0.237	0.012	0.018	0.000	0.001	0.049
<i>Market Return</i>	-4.407**	0.455***	0.194	-0.011***	0.008*	-1.726***
	1.951	0.093	0.149	0.003	0.005	0.399
<i>Hot IPO Market</i>	-0.136	-0.001	0.040*	0.001	-0.001	0.094
	0.327	0.016	0.025	0.001	0.001	0.070
<i>Industry Fixed Effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year Fixed Effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
N.	769	769	769	769	769	769
Adjusted R ² (Pseudo R ²)	(0.265)	0.204	0.341	0.514	0.092	0.122
F-Statistics (LR Statistics)	(258.470)	6.060	10.920	21.810	2.990	3.730
P-value	0.000	0.000	0.000	0.000	0.000	0.000
Hansen-Sargan's χ^2		4.284	2.005	3.934	7.989	2.641
P-value (Sargan Statistics)		0.232	0.571	0.269	0.046	0.450

Table 2 (continued)

Panel B: Using IR IPO Reputation						
	IR IPO Reputation (1b)	Price Revision (2b)	Underpricing (3b)	Bid-Ask Spread (4b)	Trading Volume (5b)	BHAR (1 Year) (6b)
Constant	-7.234* <i>4.315</i>	-0.355*** <i>0.067</i>	-0.011 <i>0.226</i>	0.032*** <i>0.002</i>	-0.005 <i>0.004</i>	0.151 <i>0.288</i>
IR IPO Reputation		0.002* <i>0.001</i>	0.005** <i>0.002</i>	-0.001** <i>0.000</i>	0.001*** <i>0.000</i>	-0.023*** <i>0.006</i>
Cohort IR	12.018*** <i>3.435</i>					
Advertising Expenses Seasoned Firms	48.421*** <i>10.639</i>					
CEO Exper. Marketing and Sales	0.996*** <i>0.273</i>					
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
N.	769	769	769	769	769	769
Adjusted R ²	0.256	0.206	0.338	0.515	0.093	0.116
F-Statistics	7.450	6.120	10.800	21.870	3.020	3.560
P-value	0.000	0.000	0.000	0.000	0.000	0.000
Hansen-Sargan's χ^2		4.773	1.957	4.005	8.991	2.801
P-value (Hansen-Sargan's χ^2)		0.189	0.581	0.261	0.029	0.423

The table reports the results of the two-stage least squares (2SLS) regressions of IPO performance on IR Consultant and IPO characteristics. It presents our main results, using various short-term and long-run measures of IPO performance. All variables are defined in Appendix B. ***, **, and * denote statistical significance at the 1%, 5% and 10% levels, respectively. The *t*-statistics are based on White (1980) heteroskedasticity-consistent standard errors and covariances. The standard errors are in italics below the coefficients.

in the second-stage regression. We fail to reject the null hypothesis of the Sargan's test in all models (*p* values are all above 10%), with the exception of *Trading Volume* regression. To further test the quality of our instruments, we apply the Stock and Yogo (2005) weak instrument test, and we find that the potential bias introduced by our instruments is small and less than 1%. Finally, we find that the *F*-statistics from the test of under-identification (instruments are irrelevant) is 25.58, which is firmly above 10 (the rule-of-thumb cutoff proposed by Staiger and Stock 1997).

In Panel B of Table 2 we examine whether more reputable IR consultants differently affect IPO performance. We use the same empirical setup as in Panel A. The IR consultant's reputation is positively related to price revision, underpricing, and trading volume. Results further show that the IR consultant's reputation is negatively related to bid-ask spread and one-year aftermarket abnormal returns. Overall, the qualitative conclusions from Panel A do not change substantially if we consider the past business volume (reputation) of the IR consultants. The same pattern of short-term over-performance and long-run underperformance is still observable.¹⁸

¹⁸ Do IR consultants jeopardize their reputation with investors by marketing subpar IPOs? The IR consultant's primary job appears to be providing additional information about private firms by planting positive news stories. The asymmetric information around IPO firms is huge. Thus, any additional information, albeit with a spin, should be useful to investors. As Solomon (2012) shows, any information, even distorted information, about the firm draws attention to the issue, which in turn creates demand for the stock. Furthermore, IR firms do not have book-building or placement responsibilities (as underwriters do), which can put the IR firm's own capital at risk. Thus, an IR firm's reputation among investors has minimal consequences for its business. Its primary clients are the private firms planning future IPOs. The more successful an IR consultant is in marketing a weak IPO, the more clients it will win in the future. Finally, most investors are probably unaware of the role IR consultants play in media coverage, and hence their reputations are hardly at stake. Their role during the IPO process is relatively unknown, and our research aims to provide further insights on this phenomenon.

In sum, the results in Table 2 support our first hypothesis. Specifically, we find that IPOs with IR consultants exhibit better short-term performance, which is followed by a long-term underperformance. These results suggest that IPO firms, specifically those that are weak and small, hire IR consultants to increase short-term demand rather than to correct long-term misvaluation. The post-IPO investors, on the other hand, see a larger-than-typical drop in stock price (lower BHAR), and thus they are the ones who bear the costs of the temporary hype.

4.2 Matching through entropy balancing technique

To better identify how IR consultants impact IPO performance, we utilize a robust multivariate matching technique known as entropy balancing (Hainmueller 2012; Chapman et al. 2019; McMullin and Schonberger 2019). This method ensures proper covariate balance between treated (IR-backed IPOs) and control (other IPOs) samples by weighing observations such that the post-weighting means and variances for treated and control firms are equal for each matching dimension. We match on 24 different dimensions (covariates), which are listed in Panel A of Table 3. The same panel also shows that, after re-weighting the observations, the differences in means and variances of covariates are minimal and statistically insignificant, which suggests that proper entropy balancing was achieved.

Using this balanced sample with the post-weighting observations, we next run the same regressions as in Table 2. We expect that the estimation results from these regressions (presented in Panel B of Table 3) to be free of any major biases, because the distributions of both treated and control observations are identical and whichever biases were affecting these distributions are now removed (Hainmueller 2012; Chapman et al. 2019). Indeed, the results with entropy balancing become economically larger and statistically stronger across all the columns (e.g., the coefficient for *Price Revision* increases from 1.1% to 3.3% and its significance strengthens from 10% to 5% confidence level). Hence the multivariate entropy balancing technique confirms, and even strengthens, our findings in the previous subsection.

4.3 The tone of media coverage

Our second hypothesis predicts that IR consultants spin their clients' news and use a more optimistic tone in the news articles as a channel to publicize IPOs and affect their performance. As explained, to test this hypothesis, we use a 3SLS estimation procedure that we present in Table 4. The F -statistics from the test of under-identification is 21.87 (i.e., greater than 10), which confirms the relevance of our selected instrument (Staiger and Stock 1997). As we do in Table 2, we instrument *IR Consultant* in our first-stage regression. However, we do not show the first-stage regression in Table 4 for brevity.

Results in Table 4 (models (12a) to (16a)) show that the estimated coefficient on *IR Consultant* is consistently positive and significant (p value <1%). Hence IPOs with IR consultants have more optimistic media coverage, suggesting that IR

Table 3 IR consultants and IPO performance measures: entropy balancing approach

Covariates	Treated (255 IPOs)			Control (514 IPOs)			Std. Diff.	Var. Ratio
	Mean	Variance	Skewness	Mean	Variance	Skewness		
	<i>Cohort IR</i>	0.400	0.018	-0.484	0.400	0.019		
<i>Advertising Exp. Seas. Firms</i>	0.101	0.003	1.126	0.101	0.003	1.088	0.000	1.000
<i>CEO Exper. Marketing & Sales</i>	0.380	0.237	0.493	0.380	0.236	0.493	0.000	1.000
<i>CEO HC</i>	0.780	0.826	0.825	0.781	0.712	0.949	0.000	1.000
<i>CEO Founder</i>	0.306	0.213	0.843	0.306	0.213	0.843	0.000	1.000
<i>Equity Offer Size</i>	0.678	0.219	-0.764	0.678	0.219	-0.764	0.000	1.000
<i>Participation Ratio</i>	7.669	4.093	-2.034	7.669	5.429	-2.040	0.000	1.000
<i>VC</i>	0.249	0.013	1.723	0.249	0.018	1.977	0.000	1.000
<i>Underwriter Reputation</i>	0.208	0.084	1.415	0.208	0.101	1.531	0.000	1.000
<i>Number of News</i>	7.024	167.2	5.668	7.026	250.1	7.895	-0.002	1.000
<i>DO Score</i>	0.597	0.108	-0.345	0.597	0.122	-0.366	0.000	1.000
<i>Log (Market Cap)</i>	2.541	0.168	-0.217	2.541	0.202	0.323	0.000	1.000
<i>Small Sales</i>	0.357	0.230	0.598	0.357	0.230	0.598	0.000	1.000
<i>Sales Growth</i>	0.938	8.946	6.535	0.938	8.305	8.090	0.000	1.000
<i>Log (Firm Age)</i>	1.048	0.083	-0.315	1.048	0.099	0.246	0.000	1.000
<i>Hi-tech</i>	0.584	0.244	-0.342	0.584	0.243	-0.342	0.000	1.000
<i>Internet</i>	0.184	0.151	1.628	0.184	0.151	1.628	0.000	1.000
<i>ROA</i>	-0.155	0.264	-2.031	-0.155	0.251	-1.843	0.000	1.000
<i>Loss</i>	0.604	0.240	-0.425	0.604	0.240	-0.425	0.000	1.000
<i>R&D</i>	0.203	0.084	2.268	0.202	0.072	1.782	0.000	1.000
<i>Deleverage</i>	0.529	0.250	-0.118	0.530	0.250	-0.118	0.000	1.000
<i>NASDAQ</i>	0.753	0.187	-1.173	0.753	0.186	-1.173	0.000	1.000
<i>Market Return</i>	0.033	0.003	-0.189	0.033	0.004	-0.114	0.000	1.000
<i>Hot IPO Market</i>	0.569	0.246	-0.277	0.569	0.246	-0.277	0.000	1.000

Panel B: IR Consultant and IPO performance after entropy balancing

	Price Revision (7a)	Underpricing (8a)	Bid-Ask Spread (9a)	Trading Volume (10a)	BHAR (1 year) (11a)
Constant	-0.573*** <i>0.181</i>	0.080 <i>0.241</i>	0.053*** <i>0.011</i>	0.011 <i>0.009</i>	-0.260 <i>0.626</i>
<i>IR Consultant</i>	0.033** <i>0.014</i>	0.059*** <i>0.019</i>	-0.002** <i>0.001</i>	0.003*** <i>0.001</i>	-0.234*** <i>0.049</i>
<i>Price Revision</i>		0.474*** <i>0.049</i>			
<i>CEO HC</i>	0.001 <i>0.007</i>	-0.017* <i>0.009</i>	-0.001 <i>0.000</i>	-0.001*** <i>0.000</i>	-0.034 <i>0.023</i>
<i>CEO Founder</i>	0.015 <i>0.014</i>	0.029 <i>0.019</i>	-0.001 <i>0.001</i>	0.001 <i>0.001</i>	0.126*** <i>0.048</i>
<i>Equity Offer Size</i>	0.084 <i>0.056</i>	-0.181** <i>0.075</i>	-0.008** <i>0.004</i>	0.002 <i>0.003</i>	-0.431** <i>0.195</i>
<i>Participation Ratio</i>	-0.015 <i>0.024</i>	0.169*** <i>0.032</i>	0.003** <i>0.002</i>	0.001 <i>0.001</i>	0.059 <i>0.084</i>
<i>VC</i>	0.024 <i>0.017</i>	0.072*** <i>0.022</i>	0.001 <i>0.001</i>	0.002*** <i>0.001</i>	0.047 <i>0.059</i>
<i>Underwriter Reputation</i>	0.003 <i>0.004</i>	-0.001 <i>0.006</i>	-0.002*** <i>0.000</i>	0.000 <i>0.000</i>	0.027* <i>0.014</i>
<i>Number of News</i>	0.000 <i>0.000</i>	0.000 <i>0.000</i>	0.000 <i>0.000</i>	0.000 <i>0.000</i>	0.000 <i>0.001</i>
<i>DO Score</i>	0.069** <i>0.032</i>	0.099** <i>0.042</i>	0.002 <i>0.002</i>	0.003** <i>0.002</i>	-0.048 <i>0.110</i>
<i>Log (Market Cap)</i>	0.090*** <i>0.020</i>	-0.015 <i>0.027</i>	-0.006*** <i>0.001</i>	-0.001 <i>0.001</i>	-0.176** <i>0.069</i>
<i>Small Sales</i>	0.018 <i>0.018</i>	-0.052** <i>0.024</i>	-0.001 <i>0.001</i>	-0.003*** <i>0.001</i>	-0.116* <i>0.062</i>
<i>Sales Growth</i>	-0.001 <i>0.002</i>	0.000 <i>0.002</i>	0.000 <i>0.000</i>	0.000 <i>0.000</i>	-0.003 <i>0.005</i>
<i>Log (Firm Age)</i>	-0.034** <i>0.017</i>	0.009 <i>0.023</i>	0.001 <i>0.001</i>	0.000 <i>0.001</i>	-0.010 <i>0.059</i>
<i>Hi-tech</i>	-0.017 <i>0.016</i>	-0.064*** <i>0.022</i>	0.000 <i>0.001</i>	-0.001 <i>0.001</i>	0.022 <i>0.057</i>
<i>Internet</i>	0.002 <i>0.021</i>	0.064** <i>0.027</i>	0.001 <i>0.001</i>	0.002* <i>0.001</i>	-0.030 <i>0.072</i>

Table 3 (continued)

<i>ROA</i>	0.040** <i>0.019</i>	0.050** <i>0.025</i>	-0.002** <i>0.001</i>	0.001 <i>0.001</i>	0.052 <i>0.065</i>
<i>Loss</i>	-0.004 <i>0.019</i>	0.023 <i>0.025</i>	-0.002* <i>0.001</i>	0.000 <i>0.001</i>	-0.047 <i>0.064</i>
<i>R&D</i>	-0.109*** <i>0.036</i>	0.124*** <i>0.047</i>	0.006** <i>0.002</i>	0.000 <i>0.002</i>	-0.185 <i>0.123</i>
<i>Deleverage</i>	-0.013 <i>0.013</i>	0.028 <i>0.018</i>	0.002** <i>0.001</i>	0.001 <i>0.001</i>	0.083* <i>0.047</i>
<i>NASDAQ</i>	-0.021 <i>0.015</i>	0.070*** <i>0.019</i>	0.002** <i>0.001</i>	0.002*** <i>0.001</i>	0.047 <i>0.050</i>
<i>Market Return</i>	0.520*** <i>0.118</i>	0.203 <i>0.158</i>	-0.024*** <i>0.007</i>	0.003 <i>0.006</i>	-1.226*** <i>0.407</i>
<i>Hot IPO Market</i>	0.009 <i>0.020</i>	0.018 <i>0.029</i>	0.001 <i>0.001</i>	-0.001 <i>0.001</i>	0.084 <i>0.069</i>
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
N.	769	769	769	769	766
Adjusted R ²	0.137	0.329	0.283	0.194	0.102
F-Statistics	4.130	10.410	8.760	5.730	3.230
P-value	0.000	0.000	0.000	0.000	0.000

The table conducts our entropy balancing matching estimation, which ensures better covariate balance between treatment (IR-backed IPOs) and control (other IPOs) groups by weighing observations such that the post-weighting mean and variance for treated and control samples are equal along the matching dimensions. We match on 24 different matching covariates, which are listed in Panel A and defined in Appendix B. Panel B runs the same regressions as in Table 2 but uses the post-weighting treated and control observations that were subject to entropy balancing. All variables are defined in Appendix B. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. The standard errors are in italics below the coefficients.

consultants spin their clients' news by emphasizing positive news and focusing less on negative news. The results (models (12b) and (13b)) also show that *Net Optimism* is positively related to *Price Revision* and *Underpricing*, which suggests that the optimistic tone of media coverage is likely to increase the demand for an IPO's shares before and during the offering. Moreover, models (14b) to (16b) indicate that *Net Optimism* is positively associated with *Trading Volume* but negatively related to *Bid-Ask Spread* and *BHAR*.

In summary, the findings in Table 4 are consistent with hypothesis 2. IR consultants use optimistic tone to publicize their clients, and this optimistic tone has a positive (negative) impact on IPO short-term (long-term) performance.¹⁹

4.4 Agency conflicts: Insiders' motives to employ IR strategies

4.4.1 Underwriter-related agency conflicts

In this subsection, we test hypothesis 3a by analyzing whether IR strategies are more common for the subset of IPOs in which we expect the underwriter-related agency

¹⁹ In further investigations, we calculate *Net Optimism* based on the original list of 10,000 search words classified by DICTION to characterize text on several dimensions (Davis and Tama-Sweet 2012). *Net Optimism* is the difference between the percentage of optimistic words and the percentage of pessimistic words, relative to the total number of words in the article (Davis et al. 2012). DICTION's own list of positive and negative words yields mean *Net Optimism* values that are positive, suggesting that a typical IPO article has a positive tone. Our results, however, remain qualitatively the same.

Table 4 IR consultants and the tone in the media

	Pricing at Offer				Aftermarket Performance in Short-Run				in Long-Run	
	Net Optimism (12a)	Price Revision (12b)	Net Optimism (13a)	Underpricing (13b)	Net Optimism (14a)	Bid-Ask Spread (14b)	Net Optimism (15a)	Trading Volume (15b)	Net Optimism (16a)	BHAR (1 Year) (16b)
	Constant	0.337	-0.433**	1.163	-0.007	-0.234	0.029***	1.973	-0.002	0.733
<i>Net Optimism</i>	2.208	0.178	0.958	0.146	0.729	0.008	1.812	0.006	1.942	1.184
		0.006*		0.026**		-0.001*		0.001**		-0.120***
		0.004		0.012		0.000		0.000		0.040
<i>IR Consultant</i>	1.256***		1.342***		1.281***		1.398***		1.453***	
	0.310		0.305		0.307		0.304		0.293	
<i>Prop. of Local Media</i>	1.637***		1.599***		1.552***		1.577***		1.445***	
	0.608		0.584		0.594		0.582		0.521	
<i>CEO HC</i>	-0.111	-0.002	-0.110	0.000	-0.111	-0.000	-0.109	0.000	-0.115	-0.024
	0.146	0.005	0.146	0.009	0.146	0.000	0.146	0.000	0.147	0.029
<i>CEO Founder</i>	0.383	0.003	0.385	0.010	0.383	0.000	0.386	0.000	0.371	0.119**
	0.306	0.011	0.306	0.018	0.306	0.000	0.306	0.001	0.307	0.060
<i>Equity Offer Size</i>	-0.894	0.036	-0.890	-0.176**	-0.893	-0.003*	-0.888	0.012***	-0.939	-0.675***
	1.231	0.045	1.231	0.074	1.231	0.002	1.231	0.003	1.233	0.241
<i>Participation Ratio</i>	0.853*	-0.008	0.832*	0.056*	0.847*	0.000	0.819*	-0.002*	0.867*	0.226**
	0.501	0.021	0.501	0.034	0.501	0.001	0.501	0.001	0.530	0.113
<i>VC</i>	0.512	0.046***	0.505	0.039*	0.510	0.000	0.501	0.000	0.502	0.026
	0.371	0.014	0.371	0.023	0.371	0.000	0.371	0.001	0.371	0.076
<i>Underwriter Reputation</i>	-0.007	-0.008***	-0.003	0.009*	-0.005	-0.001***	0.000	0.000	0.002	0.044**
	0.091	0.003	0.091	0.005	0.091	0.000	0.091	0.000	0.091	0.017

Table 4 (continued)

	Pricing at Offer				Aftermarket Performance in Short-Run				in Long-Run			
	Net Optimism (12a)	Price Revision (12b)	Net Optimism (13a)	Underpricing (13b)	Net Optimism (14a)	Bid-Ask Spread (14b)	Net Optimism (15a)	Trading Volume (15b)	Net Optimism (16a)	BHAR (1 Year) (16b)		
<i>Number of News</i>	-0.018***	0.000	-0.018***	0.001***	-0.018***	0.000	-0.018***	0.000***	-0.018***	-0.003**		
	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.001		
<i>DO Score</i>	0.436	0.104***	0.446	0.072*	0.439	0.000	0.453	0.003**	0.446	0.040		
	0.697	0.025	0.697	0.042	0.697	0.001	0.697	0.001	0.697	0.136		
<i>Price Revision</i>				0.694***								
				0.061								
<i>Log (Market Cap)</i>	-0.019	0.115***	-0.011	-0.020	-0.017	-0.006***	-0.006	0.003***	0.004	-0.190**		
	0.434	0.015	0.434	0.027	0.434	0.001	0.434	0.001	0.435	0.083		
<i>Small Sales</i>	0.375	0.020	0.377	-0.018	0.376	0.001**	0.377	0.000	0.371	-0.016		
	0.395	0.014	0.395	0.023	0.395	0.000	0.395	0.001	0.396	0.075		
<i>Sales Growth</i>	-0.010	-0.002	-0.010	0.001	-0.010	0.000	-0.010	0.000	-0.009	-0.012*		
	0.035	0.001	0.035	0.002	0.035	0.000	0.035	0.000	0.035	0.007		
<i>Log (Firm Age)</i>	-0.444	-0.016	-0.438	0.037*	-0.442	-0.001	-0.434	0.000	-0.411	-0.058		
	0.372	0.013	0.372	0.022	0.372	0.000	0.372	0.001	0.374	0.073		
<i>Hi-tech</i>	-0.080	-0.012	-0.074	-0.031	-0.078	0.001**	-0.070	-0.001	-0.066	0.026		
	0.357	0.013	0.357	0.021	0.357	0.000	0.357	0.001	0.358	0.069		
<i>Internet</i>	-0.145	0.006	-0.141	0.029	-0.144	0.000	-0.137	0.001	-0.148	0.022		
	0.454	0.016	0.454	0.027	0.454	0.001	0.454	0.001	0.458	0.087		
<i>ROA</i>	-0.096	0.020	-0.089	0.063***	-0.094	-0.001***	-0.084	0.002**	-0.086	-0.018		
	0.410	0.015	0.410	0.024	0.410	0.001	0.410	0.001	0.411	0.078		
<i>Loss</i>	0.407	-0.046***	0.408	-0.025	0.407	0.000	0.409	-0.001	0.409	-0.064		

Table 4 (continued)

	Pricing at Offer				Aftermarket Performance in Short-Run				in Long-Run			
	Net Optimism (12a)	Price Revision (12b)	Net Optimism (13a)	Underpricing (13b)	Net Optimism (14a)	Bid-Ask Spread (14b)	Net Optimism (15a)	Trading Volume (15b)	Net Optimism (16a)	BHAR (1 Year) (16b)		
<i>R&D</i>	0.408	0.015	0.408	0.025	0.408	0.001	0.408	0.001	0.408	0.080		
	-0.284	-0.049*	-0.278	0.118***	-0.282	-0.001	-0.273	-0.001	-0.279	-0.114		
	0.781	0.028	0.781	0.046	0.781	0.001	0.781	0.002	0.782	0.149		
<i>Deleverage</i>	-0.039	-0.009	-0.042	0.024	-0.040	0.000	-0.044	0.000	-0.068	0.055		
	0.294	0.010	0.294	0.017	0.294	0.000	0.294	0.001	0.296	0.056		
<i>NASDAQ</i>	0.276	-0.005	0.257	0.038**	0.270	0.002***	0.245	0.000	0.233	0.042		
	0.319	0.012	0.319	0.019	0.319	0.000	0.319	0.001	0.319	0.063		
<i>Market Return</i>	2.709	0.434***	2.820	0.108	2.742	-0.009***	2.895	0.005	2.873	-1.332***		
	2.573	0.092	2.572	0.153	2.573	0.003	2.572	0.005	2.576	0.498		
<i>Hot IPO Market</i>	0.890*	-0.006	0.891*	-0.020	0.890*	0.001	0.892*	-0.002	0.897*	0.197**		
	0.481	0.018	0.481	0.030	0.481	0.001	0.481	0.001	0.481	0.097		
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
N.	769	769	769	769	769	769	769	769	769	769		
Wald χ^2	128.030	246.950	128.460	895.260	150.980	833.410	128.980	949.780	130.440	91.020		
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Hansen-Sargan's χ^2		0.550		0.646		0.681		6.642		1.049		
P value		0.458		0.421		0.409		0.010		0.306		

This table reports the results of the three-stage least squares (3SLS) regressions of IPO performance on *Net Optimism*, which is regressed on *IR Consultant* and IPO characteristics. All variables are defined in Appendix B. ***, **, and * denote statistical significance at the 1%, 5% and 10% levels, respectively. The *t*-statistics are based on White (1980) heteroskedasticity-consistent standard errors. The standard errors are in italics below the coefficients

conflicts to be more severe. Specifically, we interact *UW Agency Score* and its two components (*Issue Again* and *High Previous Underpricing*) with *IR Consultant*, using the same estimation method and controls as in Table 2.

The results are shown in Panel A of Table 5. The first-stage regression shows that the presence of an IR consultant is positively related to *UW Agency Score*. Moreover, for underpricing, the coefficients of the interaction terms are positive and significant (at the 5% significance level or better) for all three measures of underwriter-related agency conflicts, but the coefficient of *IR Consultant* is insignificant (models (18a), (19a), and (20a)). Hence the higher underpricing, due to IR strategies, that we report previously seems to be concentrated primarily among IPOs where underwriter agency conflicts are more severe. Furthermore, models (18b), (19b), and (20b) show that the long-run reversal (lower one-year *BHAR*) is greater for this set of IR-backed IPOs, as implied by the negative coefficients of both *IR Consultant* and the interaction term (insignificant at conventional levels for one of the three measures, *High Previous Underpricing*). Combined, these results are consistent with hypothesis 3a and show that underwriter-related agency conflicts are associated with IR strategies that result in higher underpricing and lower long-run performance.

4.4.2 Venture capitalists-related agency conflicts

We next explore venture capital-related agency conflicts and their role in IR strategies used by IPOs. As reported in Table 1, IR-backed IPOs tend to be younger, high tech, and venture capital-backed. This univariate evidence suggests possible venture capital-related agency conflicts. Per hypothesis 3b, conflicted venture capitalists (young and independent ones) would benefit from the short-term (event-driven) orientation of the IR strategies, and they are more incentivized toward short-term over-performance at the expense of long-run underperformance. Such venture capitalists would be more inclined to push for hiring IR consultants to prevent failure of rushed and riskier IPOs.

The results in Panel B of Table 5 show that *VC Agency Score* is positively associated with *IR Consultant* in the first-stage regression. In the second-stage regression, we interact each venture capital agency proxy (*VC Agency Score*, *Young VC*, and *Independent VC*) with *IR Consultant* and add it to our main regressions from Table 2. In most models, the estimated coefficients of the interaction terms show that IR-backed IPOs, where venture capital-related agency conflicts are more severe (higher values for the agency proxies) experience greater underpricing and worse one-year BHARs. Thus, the results in Panel B of Table 5 support hypothesis 3b and suggest that venture capital-related agency conflicts are associated with the short-termism of the IR strategies employed during an IPO event.

5 Further investigations

5.1 IR strategies and analysts' expectations

The evidence in prior sections suggests that some IR strategies aim to raise investor expectations about future fundamentals of the IR-backed IPOs. Since some investors

Table 5 IR consultants and agency conflicts

Panel A: Underwriter agency conflicts							
IR Consultant	<i>UW Agency Score</i>			<i>Issue Again</i>		<i>High Previous Underpricing</i>	
	(17)	Underpricing (18a)	BHAR (18b)	Underpricing (19a)	BHAR (19b)	Underpricing (20a)	BHAR (20b)
Constant	1.930	-0.037	-0.077	-0.036	0.163	-0.029	-0.056
	<i>1.322</i>	<i>0.224</i>	<i>0.613</i>	<i>0.225</i>	<i>0.282</i>	<i>0.225</i>	<i>0.621</i>
<i>IR Consultant</i>		-0.019	-0.123*	0.022	-0.148***	-0.039	-0.263**
		<i>0.028</i>	<i>0.074</i>	<i>0.021</i>	<i>0.057</i>	<i>0.039</i>	<i>0.109</i>
<i>UW Agency</i>	0.265*	0.010	0.177***	0.004	0.294**	0.153	-0.408
	<i>0.162</i>	<i>0.015</i>	<i>0.041</i>	<i>0.019</i>	<i>0.050</i>	<i>0.155</i>	<i>0.431</i>
<i>UW Agency x IR Consultant</i>		0.066***	-0.099*	0.073**	-0.181**	0.486**	0.342
		<i>0.023</i>	<i>0.060</i>	<i>0.032</i>	<i>0.086</i>	<i>0.211</i>	<i>0.587</i>
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry & Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N.	769	769	766	769	766	769	766
Adjusted R ² (Pseudo R ²)	(0.248)	0.352	0.143	0.346	0.162	0.349	0.121
F-Statistics (LR Statistics)	(236.25)	10.690	4.040	10.660	4.600	10.570	3.510
P-value (F-Statistics)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P-value (Hansen-Sargan's χ^2)		0.682	0.588	0.571	0.709	0.422	0.514

Panel B: Venture capitalist agency conflicts							
IR Consultant	<i>VC Agency Score</i>			<i>Young VC</i>		<i>Independent VC</i>	
	(21)	Underpricing (22a)	BHAR (22b)	Underpricing (23a)	BHAR (23b)	Underpricing (24a)	BHAR (24b)
Constant	-2.996	-0.028	-0.086	-0.026	0.242	-0.028	-0.095
	<i>2.301</i>	<i>0.226</i>	<i>0.613</i>	<i>0.226</i>	<i>0.289</i>	<i>0.226</i>	<i>0.612</i>
<i>IR Consultant</i>		0.026	-0.180***	0.038	-0.212***	0.038	-0.159**
		<i>0.025</i>	<i>0.068</i>	<i>0.025</i>	<i>0.069</i>	<i>0.026</i>	<i>0.069</i>
<i>VC Agency</i>	0.251**	0.011	-0.032	0.026	-0.022	0.016	-0.044
	<i>0.107</i>	<i>0.011</i>	<i>0.029</i>	<i>0.017</i>	<i>0.041</i>	<i>0.014</i>	<i>0.038</i>
<i>VC Agency x IR Consultant</i>		0.030**	-0.058*	0.038**	-0.025	0.028*	-0.096**
		<i>0.013</i>	<i>0.035</i>	<i>0.018</i>	<i>0.048</i>	<i>0.017</i>	<i>0.045</i>
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry & Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N.	769	769	766	769	766	769	766
Adjusted R ² (Pseudo R ²)	(0.264)	0.340	0.125	0.341	0.121	0.338	0.127
F-Statistics	(257.810)	10.660	3.730	10.690	3.640	10.560	3.770
P-value (F-Statistics)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P-value (Hansen-Sargan's χ^2)		0.705	0.224	0.770	0.449	0.663	0.160

The table analyzes the agency conflicts associated with underwriters (UWs) and venture capitalists (VCs). *High Previous Underpricing* equals 1 (0) if the average underpricing of the IPOs it sponsored during the past three years is higher (lower) than the median of the entire underwriters' sample. *Issue Again* equals 1 if the issuing firm conducts an SEO within the two years after the IPO date and 0 otherwise. *UW Agency Score* is a combined underwriter agency conflict score constructed as a sum of the previous two dummy variables (*Issue Again* and *High Previous Underpricing*), and it ranges from 0 to 2. *Young VC* indicates whether (=2) or not (=1) a venture capitalist's age is in the first tercile of the sample. *Independent VC*, indicates whether a venture capitalist is affiliated with any other institution (=1) or is independent (=2). *VC Agency Score* is a combined venture capitalist agency conflict score, and it is 0 (when the IPO has no venture capitalist support), 1 (when the venture capitalist is neither young nor independent), 2 (when the venture capitalist is either young or independent but not both), and 3 (when the venture capitalist is both young and independent). The columns labeled as (-a) show the results for underpricing using the same controls and estimation as in Table 2, and the columns labeled (-b) show the results for one-year BHAR again, using the same controls and estimation as in Table 2. All variables are defined in Appendix B. The estimated coefficients of the control variables are suppressed to save space. *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. The *t*-statistics are based on heteroskedasticity-consistent standard errors and covariances. The standard errors are in italics below the coefficients

tend to naively rely on optimistically biased analysts' forecasts made around the equity issuances (Dechow et al. 2000; Dambra et al. 2018), we use the degree of analysts' over-optimism as a proxy of how high are the expectations of investors about firm fundamentals around the IPO event. Specifically, using I/B/E/S database, we calculate analysts' earnings forecast error (*AFE*) using the methodology of Huyghebaert and Xu (2016); namely, $AFE = (\text{analyst earnings per share (EPS) forecasts} - \text{actual EPS}) / (\text{actual EPS})$. Using the same database, we also determine whether the first few actual reported earnings in the post-IPO period is a loss (*Post-IPO Loss* = 1). We focus on the first two quarterly earnings (Q1 & Q2) and the first annual earnings (Year1) following the IPO date, and we require that all analysts' earnings forecasts be initiated during the 90 days following the IPO date.²⁰

Using these two measures, the analysts' expectations around the IPO event (*AFE*) and the actual materialized firm performance in the post-IPO period (*Post-IPO Loss*), we analyze the role of IR strategies in forming overly optimistic analysts' expectations. The estimation results are reported in Table 6. The univariate results in Panel A point to a positive and statistically significant association between *IR Consultant* and the two measures, *AFE* and *Post-IPO Loss*. Panel B of the same table confirms this finding in a multivariate regression setting,²¹ whereby the dependent variable *AFE* (or *Post-IPO Loss*) is regressed on *IR Consultant* plus controls. Again, the IR strategies are significantly associated with over-optimistic analysts' forecasts and with disappointing actual performance.

In the next subsection, we analyze what kinds of investors are more receptive to the IR strategies that create over-optimistic expectations.

5.2 Who invests in IR-backed IPOs?

Research on the nature of investors participation suggests that individual investors are attracted to "attention-grabbing stocks" that are in the news and that this leads to poor subsequent returns for them (Barber and Odean 2008). In contrast, institutional investors are better at interpreting readily available information, and thus they are less likely to be drawn to low-quality IPOs (Field and Lowry 2009; Chemmanur et al. 2010). In general, institutional investors are on average smart investors who are able to identify above-average investments (Gibson et al. 2004), and they are less likely to be influenced by the media than individual investors are (Gurun and Butler 2012). However, not all institutional investors are equally capable (Edelen et al. 2016). IR consultants' efforts could increase the participation of less sophisticated or smaller institutions, distant institutions (those that usually do not invest and thus are not experienced in IPOs), and many individual investors, who tend to misinterpret the relevance of the information distorted by IR consultants (Field and Lowry 2009). Compared to other IPOs, we therefore expect IR-backed IPOs to have higher ownership by individual investors. Furthermore, among all the participating

²⁰ This narrow window of 90 days assures that analysts' optimism is measured as close as possible to the IPO date. Using shorter time window of 30 days or 60 days shrinks substantially our sample of observable analysts' forecasts. For comparison, Dambra et al. (2018) study requires that the analysts' forecasts to be released in the 180 days following the IPO date.

²¹ The estimation is again 2SLS with the same first- and second-stage regression specifications as in Table 2. When the dependent variable is *AFE* (*Post-IPO Loss*), the second stage is an OLS (a probit) regression.

Table 6 IR consultants and analysts' expectations

		Forecast Error				Post-IPO Loss			
		Entire Sample	IR-Backed IPOs	Non-IR-Backed IPOs	P-value Diff. of Means	Entire Sample	IR-Backed IPOs	Non-IR-Backed IPOs	P-value Diff. of Means
Q1	N.	486	173	313		527	187	340	
	Mean	0.346	0.687	0.157	0.001***	0.336	0.460	0.268	0.000***
Q2	N.	560	193	367		590	202	388	
	Mean	-0.015	0.243	-0.151	0.001***	0.363	0.485	0.299	0.000***
Year1	N.	616	218	398		637	234	403	
	Mean	0.008	0.112	-0.048	0.048**	0.435	0.526	0.383	0.000***

		OLS regression of analysts' forecast error			Probit regression of post-IPO loss		
		Q1 Forecast Error (25a)	Q2 Forecast Error (25b)	Year1 Forecast Error (25c)	Q1 Post-IPO Loss (26a)	Q2 Post-IPO Loss (26b)	Year1 Post-IPO Loss (26c)
Constant		0.778	0.877	0.377	0.221	-1.104	0.735
		<i>2.050</i>	<i>1.509</i>	<i>1.140</i>	<i>1.256</i>	<i>1.212</i>	<i>1.299</i>
IR Consultant		0.501***	0.267**	0.244**	1.043*	1.526***	0.588*
		<i>0.188</i>	<i>0.131</i>	<i>0.100</i>	<i>0.549</i>	<i>0.544</i>	<i>0.038</i>
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N		486	560	550	520	590	570
Adjusted R ²		0.282	0.063	0.054	---	---	---
F-Statistics (F-Stat's P-value)		1.360 (0.077)	1.970 (0.001)	1.800 (0.003)	---	---	---
P-value (Hansen-Sargan's χ^2)		0.951	0.996	0.542	0.150	0.127	0.280
Wald χ^2		---	---	---	131.250	147.560	141.020
P-value (from probit reg.)		---	---	---	0.000	0.000	0.000

The table analyzes the role of IR strategies in creating overly optimistic analysts' expectations as captured by the analysts' forecast error (*AFE*) and the post-IPO actual earnings. *AFE* is calculated as (*analyst earnings per share (EPS) forecasts* – *actual EPS*) / (*actual EPS*). All analysts' earnings forecasts are initiated during the 90 days following the IPO date, and the considered forecast periods are the first two quarterly earnings (Q1 and Q2) and the first annual earnings forecast (Year1) following the IPO date. *Post-IPO Loss* is a dummy equals to 1 if post-IPO net income at the end of the corresponding earnings period (Q1, Q2, or Year1) is negative and 0 otherwise. Panel A conducts univariate analyses by comparing IR-backed and non-IR-backed IPOs. Panel B conducts regressions analyses: OLS regression for *AFE* and Probit regression for *Post-IPO Loss*. Our regression models use the same controls and estimation as in Table 2, and we report only the second-stage regression results (Eq. (1ab)). First-stage regression is the same as in Table 2. All variables are defined in Appendix B. The estimated coefficients of the control variables are suppressed to save space. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. The *t*-statistics are based on heteroskedasticity-consistent standard errors and covariances. The standard errors are in italics below the coefficients

institutional investors, the smaller, unsophisticated, and distant institutions are likely to be overrepresented relative to the other types of institutional investors.

To measure the extent to which institutional investors are involved with an IPO firm, we follow Field and Lowry (2009) and collect data on post-IPO institutional investors' involvement, using the Thomson 13F Institutional Holdings database during the first quarter following the IPO date.²² We calculate post-IPO *Institutional Ownership* as the total number of shares owned by each institution divided by the number of shares offered (the float), which is consistent with the findings of Field and Lowry (2009). We then measure the proportion of distant institutional investors (*Distant Institutional Investors*) at the end of the first post-IPO quarter. Distant investors are institutions that have not invested in any IPO during the past three years. Finally, we define *Small Institutional Investors* as the proportion

²² Like Field and Lowry (2009), we focus on voluntary post-IPO holdings by each institution, and we exclude pre-IPO investors using the list of initial investors in the IPO prospectus (i.e., venture capital firms and any other institutional investors). We also exclude any institutional investor with more than 15% of the shares offered in the IPO based on the assumption that one entity is extremely unlikely to obtain such a large stake during the book-building period, suggesting that it probably owned these shares prior to the IPO.

of institutional investors that are classified as small, according to the size of their investment portfolios at the end of the first quarter following the IPO date (see Appendix B).

Table 7 presents the descriptive statistics and the results from various multivariate regressions of the above three measures of institutional participation on *IR Consultant*, using the same set of controls as in Table 2. Panel A shows that IR-backed IPOs have a higher proportion of distant institutional investors than non-IR-backed IPOs (12.8% versus 10.6%, respectively). The sample average of post-IPO institutional ownership is significantly lower in IR-backed IPOs (49.6%) than in the other IPOs (57.8%), and the average proportion of small institutional investors is higher in IR-backed IPOs than in the other IPOs (33.6% versus 29.9%, respectively). All differences are significant at the 1% level.

Panel B presents the second-stage regressions, using each of the institutional investors' characteristics as a dependent variable. Hiring an IR consultant is negatively related to institutional ownership. However, the results also show that IR consultants help attract small and distant (unfamiliar with IPO market) institutions. Overall, these

Table 7 Post-IPO institutional investors' characteristics

Panel A: Descriptive statistics							
	Entire Sample (N=697)		With IR (N=237)		Without IR (N=460)		P-value
	Mean	Median	Mean	Median	Mean	Median	Diff. of Means
<i>Institutional Ownership</i>	0.550	0.558	0.496	0.505	0.578	0.607	0.000***
<i>Distant Institutional Investors</i>	0.114	0.102	0.128	0.114	0.106	0.092	0.000***
<i>Small Institutional Investors</i>	0.312	0.289	0.336	0.292	0.299	0.288	0.002***

Panel B: IR consultants and institutional investors (2SLS)			
	Institutional Ownership (27)	Distant Institutional Investors (28)	Small Institutional Investors (29)
Constant	0.126 <i>0.140</i>	0.062 <i>0.079</i>	0.496*** <i>0.079</i>
<i>IR Consultant</i>	-0.036* <i>0.021</i>	0.031*** <i>0.006</i>	0.024** <i>0.012</i>
Controls	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
N.	697	697	697
Adjusted R^2	0.123	0.121	0.141
F-Statistics	3.510	3.450	3.930
P-value (F-Statistics)	0.000	0.000	0.000
P-value (Hansen-Sargan's χ^2)	0.209	0.562	0.066

This table reports the test of the association between *IR Consultant*, *Net Optimism* and post-IPO institutional investors' involvement around the IPO event (i.e., institutional involvement at the end of the first quarter following the IPO date). Institutional investors' involvement is measured through institutional ownership of the IPO stock (in %), the invested institutions' tendency to purchase recent IPO shares (i.e., what proportion of them are classified as "distant institutions"), and the proportion of invested institutions that are small. All variables are defined in Appendix B. Panel A reports the means and medians, and Panel B examines the association between the presence of IR consultants and institutional investors' involvement, using the estimation model from Table 2. The estimated coefficients of the control variables are suppressed to save space. ***, **, and * denote statistical significance at the 1%, 5% and 10% levels, respectively. The *t*-statistics are based on White (1980) heteroskedasticity-consistent standard errors and covariances. The standard errors are in italics below the coefficients

findings suggest that IR strategies help attract individual investors and smaller or inexperienced distant institutions.

These findings are novel in the investor relations literature, as they suggest that IR consultants have a different approach in helping IPO firms versus the seasoned firms. Rather than focusing on long-run institutional ownership of a seasoned stock (a la Bushee and Miller 2012; Kirk and Vincent 2014), IR strategies for IPO firms seem event-driven (a la Solomon 2012). They are tailored toward increasing the short-term demand for shares primarily around the IPO date, which ensures the success of the equity offering. As short-term and event driven strategies require a lot of hype and news spinning, they are ineffective for large sophisticated institutional investors, who are better at interpreting publicly available information (Field and Lowry 2009; Edelen et al. 2016).

5.3 Termination dates of the IR programs and post-IPO stock performance

If IR strategies prop up an IPO firm's short-term performance, we expect that, when the IR consultant's relationship with the firm ends, the stock's performance would deteriorate and investors would suffer major losses. To analyze further the link between IR strategies and post-IPO stock performance, we focus on the staggered termination dates of IR programs shortly after the IPO dates. These staggered termination dates could help us identify how the length of IR programs affects post-IPO performance. To gather data on IR-termination cases, we read corporate press releases following the IPO date to check whether the name of its previous IR consultant (or any other IR consultant) is mentioned or replaced by a corporate contact. If we cannot locate the name of any IR consultant in the corporate press release, we assume that the firm terminated its relationship.

Panel A of Table 8 displays the number of IPOs that terminate their IR programs within one year after the IPO date, and the average post-IPO *BHARs* of each IPO subsample. The pattern in that panel suggests that the sooner a firm terminates its IR program, the sooner its *BHAR* turns negative. Put differently, the longer IPOs continue their relationships with IR consultants, the higher *BHAR* their investors receive. The results using medians yield similar qualitative conclusions and are suppressed to save space.

We test this relationship more formally in a regression setting. For this purpose, we create a new dummy variable, *IR-IPO Continuing Relationship*, which equals to 1 if, in the analyzed post-IPO period, the relationship between the IR consultant and the IPO firm is still continuing, and zero otherwise. The analyzed post-IPO periods are the end of the first quarter (three months), the end of the second quarter (six months), the end of the third quarter (nine months), and the end of the fourth quarter (one year). For each analyzed post-IPO period, we calculate the corresponding *BHAR* (three-month *BHAR*, six-month *BHAR*, nine-month *BHAR*, and 12-month *BHAR*) for each IPO in our sample, using its CRSP monthly returns data. We then run the following difference-in-difference regressions for each analyzed period (*N-mo*) separately.

$$IR\ Consultant = \alpha_0 + \alpha_1 Instruments\ for\ IR + \alpha_2 Controls + \varepsilon \quad (3a)$$

$$BHAR_{N-mo} = \beta_0 + \beta_1 IR\ Consultant + \beta_2 IR-IPO\ Continuing\ Relationship + \beta_3 Controls + \eta \quad (3b)$$

Table 8 Continuing IR-IPO relationship and IPO stock performance

Panel A: BHAR depending on when the IPO firm terminated its relationship with the IR consultant				
<i>IR-IPO Termination Date</i>	BHAR 3-mo	BHAR 6-mo	BHAR 9-mo	BHAR 12-mo
Number of IR-IPO terminated relationships	40	61	76	99
Mean	-0.237	-0.341	-0.376	-0.412
Number of IR-IPO Continuing relationships	215	194	179	156
Mean	-0.123	-0.078	-0.041	0.031
<i>P</i> -value for Mean Diff.	0.224	0.001***	0.000***	0.000***

Panel B: 2SLS estimation of IR-IPO continuing relationship's effect on BHAR				
	BHAR 3-mo (30a)	BHAR 6-mo (30b)	BHAR 9-mo (30c)	BHAR 12-mo (30d)
<i>IR Consultant</i>	-0.093*** <i>0.053</i>	-0.194*** <i>0.054</i>	-0.304*** <i>0.064</i>	-0.420*** <i>0.064</i>
<i>IR-IPO Continuing Relationship</i>	0.088 <i>0.056</i>	0.209*** <i>0.058</i>	0.267*** <i>0.070</i>	0.349*** <i>0.072</i>
Controls	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
N.	766	766	766	766
Adjusted R^2	0.026	0.078	0.113	0.148
<i>F</i> -Statistics	1.520	2.620	3.450	4.330
<i>P</i> -value	0.023	0.000	0.000	0.000
<i>P</i> -value (Hansen-Sargan's χ^2)	0.663	0.676	0.656	0.392

This table uses IPO firms that terminate their IR contracts as an experiment to identify the link between IR consultants and IPO performance. Panel A determines how many IPOs terminate their IR contracts by the end of the first post-IPO year and how many continue their relationships beyond the first year. It also presents *BHAR*s (3-, 6-, 9-, and 12-months) for each subsample of IPOs. Panel B reports the results from the 2SLS regressions run by adding *IR-IPO Continuing Relationship* dummy to the second-stage regression. The dependent variable is the *BHAR* for each post-IPO period (3-, 6-, 9-, and 12-months). In the *BHAR* (3-mo) column, *IR-IPO Continuing Relationship* equals 1 if a given IPO continues its relationship with an IR consultant as of the end of the first post-IPO quarter, and 0 otherwise. In the *BHAR* (6-mo) column, *IR-IPO Continuing Relationship* is 1 if the relationship continues beyond six months, and so on for the other *BHAR* columns. All other variables are defined in Appendix B. The estimated coefficients of the control variables in Panel B are suppressed to save space. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. The *t*-statistics are based on heteroskedasticity-consistent standard errors and covariances. The standard errors are in italics below the coefficients

Table 8, Panel B, reports the results from this estimation. *IR Consultant* still has a negative coefficient for all analyzed post-IPO periods. Furthermore, the estimated coefficient of *IR-IPO Continuing Relationship* is always positive (statistically significant for the two quarters or longer post-IPO periods). This implies that, if IR consultants continue to support a firm, that firm's stock outperforms the IPO firms that terminated their IR programs. In short, the evidence in Table 8 implies a clear link between the presence of IR consultants and stock performance in the post-IPO period. It also suggests that the short-term orientation of IR strategies is the main driver of the hype around IPO events and that firms that maintain long-term relationships with their IR consultants exhibit better long-term IPO performance.²³

²³ In an untabulated robustness test, we find a statistically insignificant association between the duration of the IR-IPO continuing relationship and IPO operating performance at the end of the first year, using both the return-on-assets and the cash-flow-to-assets ratios. This finding suggests that IR consultants are unlikely to quit for reasons related to an IPO's bad operating performance (e.g., IR consultants abandon a sinking ship to save their reputations) or due to lack of funds at the terminating IPO firms. (See Appendix A for some estimates on the costs of hiring an IR consultant.)

5.4 IR strategies in less risky IPOs

Do all IPO firms that hire IR consultants do so to mislead investors in order to achieve short-term gains? We investigate this issue next. We focus on the IR-backed IPOs firms with solid economic fundamentals (low risk) but that are still very small and thus lack sufficient visibility. We argue that these IPO firms are likely to hire IR consultants to improve the information environment around the firm rather than to achieve short-term gains by spinning the news.

Using market capitalization as a proxy for IPO visibility, we find that out of 385 less visible IPOs (below median market capitalization), 158 are also low risk and 50 of those IPO firms hired an IR consultant. As a proxy for IPO risk, we use *DO Score*, developed by Patatoukas et al. (2018). It is constructed using three criteria: (i) the firm has above median pre-IPO sales growth, (ii) it reports a pre-IPO loss, and (iii) it has above median intangible intensity (R&D expenditures + advertising expenses) / sales). *DO Score* measures the divergence of investor opinion (investor uncertainty), using pre-IPO characteristics related to the uncertainty of firm's fundamentals. It ranges between 0 and 1 and increases with IPO risk. (For further details on this variable, please see Appendix B.) We classify an IPO as low risk if its *DO Score* is less than the sample median.

Our results (reported in the online appendix) show that, for low-visibility and low-risk IPOs that hire IR consultants, *Underpricing (BHAR)* is less (greater) than other IPOs in the sample. Thus, such IPOs do not seem to employ IR strategies only for short-term gains, and they end up performing better in the long run, relative to the other IR-backed IPOs.

6 Conclusion

We examine the role the investor relations consultants play during initial public offerings. We document that smaller and weaker IPO firms, which are typically characterized by asymmetric information and agency issues, are more likely to hire IR consultants prior to their IPO date. IR consultants help by increasing the optimistic tone in the news articles covering their clients during the IPO quiet period, and this optimism is positively (negatively) related to short-term (long-term) IPO performance. IR-backed IPOs have higher IPO price revisions, higher first-day stock returns, and relatively better post-IPO market liquidity. Analysts covering the IR-backed IPOs seem to have more optimistic expectations about these firms' fundamentals at the time of the IPO, but the actual post-IPO performance of these firms involves more frequent negative earnings surprises. Thus, IR consultants' role in IPOs seems to be event-driven and short-term oriented.

Furthermore, we find that underwriter agency issues (Liu and Ritter 2010; Chang et al. 2017) play a key role in IR-related short-term over-performance and long-term underperformance. Similarly, venture capital-related conflicts of interest (Gompers 1996; Croce et al. 2015; Megginson et al. 2019) are also associated with the IR strategies that IPO firms use. These findings suggest that IPO insiders benefit from IR strategies that create short-lived demand (higher first-day returns) for new shares around the issuance date. However, this positive effect is temporary; it reverses within a few years. Consequently, investors who react favorably to event-oriented, short-term IR

strategies (primarily individual investors and institutions that are small and unsophisticated) bear the costs of IR-based hyping strategies.

Our study adds to the literature on media coverage and investor recognition by showing that the presence of IR consultants is associated with optimistic media coverage of their clients and that this optimistic tone impacts IPO performance. The study also contributes to the investor relations literature by showing that IR consultants have a different approach for bolstering IPO firms than seasoned firms. Finally, our study advances the IPO literature by documenting that IR strategies could affect the performance of IPO firms, especially those that are characterized by asymmetric information and underwriter and venture capital related agency issues.

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Appendix A: IPO services provided by IR consultants and the cost estimates

According to the webpage of BlueShirt Group, a major IR consultant in our sample, services provided to IPO firms include:

- Investment bank/sell-side analyst recommendations
- IPO roadshow slide development
- Presentation and Q&A preparation
- “Pricing day” business press considerations
- IR website development and coordination
- Shareholder communication systems
- Employee communications and spokesperson guidelines
- Conduct “Disclosure 101” programs for senior staff
- Create post-IPO sell-side, buy-side target lists
- Preparation for first earnings release and conference call

Source: <http://www.blueshirtgroup.com/services/ipo-advisory/default>

Pinpointing an IPO firm’s costs of hiring an outside IR consultant is challenging, as these costs can vary substantially from IPO to IPO and from consultant to consultant. However, according to Adelina Paltea, “Show me the money – PR agency pricing structure fundamentals” (available at <http://getmustr.com/blog/show-money-pr-agency-pricing-structure-fundamentals-2/>), a typical startup firm pays somewhere between \$5,000 to \$10,000 monthly retainer fees, with a minimum commitment of six months. Most reputable IR consultants would have retainer fees ranging from \$20,000 to \$50,000 per month. Some IR consultants also charge project-based fees. However, pay-for-performance pay structures are uncommon for IR consultants advising IPO firms.

Appendix B: Variable definitions

Main variables

Price Revision	The percentage change between the mid-price of the initial price range and the offer price.
Underpricing	The ratio of the difference between the closing price on the first day of trading and the offer price divided by the offer price.
Bid-Ask Spread	The average daily closing spread ((bid-ask)/midpoint of the price range) during the one-month period following the end of the first-day of trading.
Trading Volume	The average number of shares traded daily during the one-month period following the end of the first-day of trading.
BHAR	The buy-and-hold abnormal return over the one-year period following the end of the first-day of trading, using CRSP data. As a benchmark market return index, we use the equally weighted CRSP index.
IR Consultant	A dummy variable equals 1 if the IPO firm hires an IR consultant prior to the IPO date and zero otherwise.
IR IPO Reputation	This variable captures the IR consultant's reputation among IPO firms. It ranges from 1 to 10, least to most reputable, and the ranking is by deciles, based on the average market capitalization of IPOs that the IR consultant was engaged in during the three years prior to the current IPO date. The ranking is done separately within each year. (See the online appendix for more details.)
Net Optimism	The difference between the percentage of positive or optimistic words and the percentage of negative or pessimistic words, relative to the total number of words in the news article. It is calculated using the word classifications of Loughran and McDonald (2011, 2016), and it is based on the media articles covering the IPO firm during the 90-day period up to one day prior to the offer date.

Control variables

CEO HC	A human capital index of the CEO that ranges from 0 to 5. This index includes (1) finance education background; (2) experience as a top management team member of a publicly listed firm; (3) finance experience as a CFO, venture capitalist, private equity investor, investment banker, or more than one of these; (4) IPO experience; or (5) CEO experience. It is calculated following the methodology of Pollock et al. (2009).
CEO Founder	A dummy variable that equals 1 if the CEO is the founder of the IPO firm and zero otherwise. Founders' data is from the IPO prospectuses.
Equity Offer Size (Free Float)	The ratio of the number of shares issued on the IPO date to the total number of shares outstanding after the public offering. Data is from the ThomsonOne database and the IPO prospectuses.
Participation Ratio	The fraction of the IPO proceeds sold by existing shareholders. It is equal to the secondary shares sold by existing shareholders over the total number of shares offered (i.e., primary and secondary shares). Data is from the ThomsonOne database.
VC	A dummy variable that equals 1 if the IPO firm is venture capital-backed and zero otherwise. Data is from the ThomsonOne database.
Underwriter Reputation	A reputation index for each underwriter calculated based on Loughran and Ritter (2004) on a 0 to 9.1 scale (least to most prestigious, respectively). Data is from Jay Ritter's website.

Number of News	The total number of media articles covering the IPO firm during the 90-day period up to one day prior to the offer date.
DO Score	It is a measure of the divergence of investor opinion (investor uncertainty), created using certain pre-IPO characteristics indicating underlying firm risk. We construct it following Patatoukas et al. (2018). An IPO firm receives one point for each of three criteria: (i) the firm has above median pre-IPO sales growth, (ii) it reports a pre-IPO loss, and (iii) it has above median intangible intensity. (Intangible intensity is measured as (R&D expenditures + advertising expenses) / sales; all accounting variables are measured as of the last fiscal year prior to the IPO.) To obtain a standardized scores between 0 and 1, we sum up the points and divide by 3.
Market Cap	The offer price multiplied by the post-IPO number of shares outstanding as presented in the final IPO prospectuses.
Small Turnover	A dummy variable that equals 1 if the IPO firm is extremely small (has sales less than \$50 million) and zero otherwise. Sales are measured for the last fiscal year prior to the IPO date.
Sales Growth	The year-over-year change in sales (in %) measured as of the last fiscal year prior to the IPO date.
Firm Age	The number of years since the founding date of the IPO firm. Data is from the IPO prospectuses or Jay Ritter's website for missing data.
Hi-tech	A dummy variable that equals 1 if the IPO is a high-tech firm and zero otherwise. In line with Loughran and Ritter (2004), high-tech firms are those with SIC codes 3571, 3572, 3575, 3577, 3578 (computer hardware), 3661, 3663, 3669 (communications equipment), 3671, 3672, 3674, 3675, 3677, 3678, 3679 (electronics), 3812 (navigation equipment), 3823, 3825, 3826, 3827, 3829 (measuring and controlling devices), 3841, 3845 (medical instruments), 4812, 4813 (telephone equipment), 4899 (communications services), 7371, 7372, 7373, 7374, 7375, 7378, and 7379 (software). Data is from the ThomsonOne database.
Internet	A dummy variable that equals 1 if the IPO is an internet firm as defined by the ThomsonOne database and zero otherwise.
ROA	Net income divided by total assets as reported in the fiscal year prior to the IPO date.
Loss	A dummy variable that equals 1 if the IPO firm had losses (negative net income) during the last year prior to the IPO date and zero otherwise. Data is from the IPO prospectuses.
R&D	Research and development (R&D) expenses reported in the fiscal year prior to the IPO, scaled by total assets. If R&D is missing in Compustat's annual files, we assume it is zero.
Deleverage	A dummy variable that equals 1 if the IPO proceeds are used to reduce debt and zero otherwise. Data is extracted from the IPO synopsis, as listed in the ThomsonOne database.
NASDAQ	A dummy variable that equals 1 if the IPO firm is going public on the NASDAQ stock exchange and zero otherwise. Data is from the ThomsonOne database.
Market Return	The buy-and-hold return of the equally weighted CRSP market index during the three-month period prior to the IPO date.
Hot IPO Market	A dummy variable that equals 1 if the heat measure during the quarter is at least 1.33 (i.e., a hot quarter) and zero otherwise. The heat measure is equal to the ratio of the current quarter's number of IPOs to the moving average of the number of IPOs during the past 10 years (40 quarters). It is calculated following the methodology of Yung et al. (2008).

Agency variables

Issue Again	A dummy variable that equals 1 if the issuing firm conducts a seasoned-equity offering (SEO) within the two years after the IPO date and zero otherwise.
High Previous Underpricing	A dummy variable equals one if the average underpricing of the IPOs that the underwriter sponsored during the past three years is higher than the median of the entire underwriters' sample and zero otherwise.
UW Agency Score	It is a combined underwriter agency conflict score constructed as a sum of Issue Again and High Previous Underpricing, and it ranges from 0 to 2.
Young VC	It equals 2 (1) if the venture capitalist's age is in the first (second and third) tercile of the sample and zero when the IPO firm is not backed by any venture capitalist.
Independent VC	It equals 2 (1) if the venture capitalist is independent (affiliated with any other institution) and zero when the IPO firm is not backed by any venture capitalist.
VC Agency Score	It is a combined venture capitalist agency conflict score. It equals zero (when the IPO has no venture capitalist support), 1 (when the venture capitalist is neither young nor independent), 2 (when the venture capitalist is either young or independent but not both), and 3 (when the venture capitalist is both young and independent).

Analysts' expectations and post-IPO financial performance variables

Analysts' Forecast Error (AFE)	Analysts' forecast error, which is equal to the difference between analysts' earnings per share (EPS) forecasts and actual EPS, all divided by the absolute value of EPS, in line with Huyghebaert and Xu (2016). All analysts' earnings forecasts are initiated during the 90 days following the IPO date, and the considered forecast periods are the first two quarterly earnings (Q1 and Q2) and the first annual earnings forecast (Year1) following the IPO date. The data is from I/B/E/S.
Post-IPO Loss	A dummy variable that equals 1 if post-IPO net income at the end of the corresponding earnings period (Q1, Q2, or Year1) is negative and zero otherwise. The data is from I/B/E/S.

Institutional investor variables

Institutional Ownership	The proportion of shares held by institutional investors to total shares offered (i.e., the float at the end of the first quarter following the IPO date). Data is from the Thomson 13F Institutional Holdings database.
Distant Institutional Investors	The proportion of distant institutional investors within an IPO firm's institutional investor pool measured at the end of the first post-IPO quarter. Distant investors are institutions that have not invested in any IPO during the past three years. An institution is considered to have invested in an IPO if it reports holdings in this IPO's shares within 120 days of the IPO date. The number of days (120) reflects the methodology of Field and Lowry (2009, pp. 492–493). Data is from the Thomson 13F Institutional Holdings database.
Small Institutional Investors	The proportion of small institutional investors within an IPO firm's institutional investor pool measured as of the end of the first post-IPO quarter. To determine whether an institution is small, we first calculate the market capitalization of its portfolio at the end of each calendar year. Then, in each quarter, we sort all the institutions in 13F files into size quintiles, according to the market capitalization of their portfolios. An institution is considered small if it is not in the highest size quintile.

Instrumental variables

Cohort IR	The proportion of same-cohort IPO firms (recent IPOs issued within one year prior to the current IPO's offering date) that hire IR consultants.
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CEO Experience in Marketing and Sales	A dummy variable that equals 1 if the CEO has managerial experience or a degree in marketing or sales and zero otherwise.
Advertising Expenses of Seasoned Firms	The average advertising expenses as a percentage of sales for all publicly listed seasoned companies firms within the Compustat database during the last fiscal year prior to the IPO date.
Proportion of Local Media	The proportion of news articles published about an IPO firm by the local media, relative to the total number of news articles. In line with Gurun and Butler (2012), a news article is considered to be local if the distance between the location of the newspaper's main office and the location of the IPO firm's head-office is less than 100 miles.

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