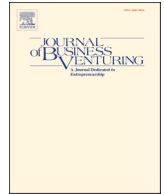




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The sandwich game: Founder-CEOs and forecasting as impression management[☆]

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ABSTRACT

Drawing on impression management and social exchange theory, we examine the use of positively biased forecasts by (non-)founder-CEOs as an impression management tactic vis-à-vis their existing investors. Contrary to their non-founder counterparts, founder-CEOs identify more with the venture they founded and, therefore, experience greater instrumental and affective concerns about the long-term relationship with their investors. Consequently, we hypothesize that founder-CEOs will strategically provide less positively biased forecasts to their investors than non-founder-CEOs. Using two independent samples with revenue forecasts reported to different venture capital investors and a causal chain scenario study consisting of two experiments, we find consistent support for our hypothesis. Overall, this study provides new insights into the use of forecasts as a post-investment impression management tactic by distinct types of CEOs in entrepreneurial ventures.

1. Executive summary

Entrepreneurs frequently use impression management (IM) tactics to present themselves favorably towards prospective investors (e.g., [Anglin et al., 2018](#); [Parhankangas and Ehrlich, 2014](#); [Zott and Huy, 2007](#)), or even to deceive them (e.g., [Benson et al., 2015](#); [Pollack and Bosse, 2014](#); [Rutherford et al., 2009](#)). While existing research demonstrates how IM is used to raise initial funding, we know little as to how and under what conditions IM towards investors is used once initial funding has been secured. To shed light on such post-investment IM, this study builds theory and presents new empirical evidence regarding how entrepreneurs use financial

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forecasts as an IM tactic and how the incentives to do so differ between founder- versus non-founder-CEOs.

We rely on a mixed-methods approach whereby we first gathered a unique dataset comprised of yearly revenue forecasts privately provided by entrepreneurs to their VC investor. We conducted a replication study on the basis of a second dataset on revenue forecasts from a different VC located in a different Western-European country. Finally, we conducted a causal chain scenario study consisting of two experiments aimed at further uncovering the key causal arguments we make. Collectively, the results show consistent support for the use of forecasting as an IM tactic; founder-CEOs provide less positively biased forecasts to their existing investors than non-founder-CEOs, and they do so as a result of making different tactical considerations. Our results suggest that because founders identify more closely with their venture, they will more heavily weigh the financial and social costs of engaging in forecasting IM.

This research makes three contributions. First, our study is one of the first to study post-investment IM tactics used by entrepreneurs. As such, we add to existing IM research in entrepreneurship that primarily focuses on entrepreneurs' use of IM tactics to attract initial funding. Second, our study extends IM literature with insights from social exchange theory. Such a combined perspective explains how distinct types of CEOs engage to a different extent in forecasting IM because they differently value the costs and benefits of forecasting IM towards their existing investors. By doing so, we add to a dearth of research on the antecedents of IM behavior by entrepreneurs (e.g., [Benson et al., 2015](#)). Third, we provide a theoretical explanation why positively biased forecasts may not solely be the result of cognitive biases, but also a deliberate form of IM.

The study also has important practical implications for entrepreneurs. Post-hoc tests suggest that entrepreneurs do not get away with forecasting IM post-investment: VCs are more likely to downgrade firms (that is, put them in a higher risk category) in reaction to more positively biased forecasts and we fail to find evidence that forecasting IM helps in raising a new round of financing. Our study also has implications for investors as recipients of forecasts. Entrepreneurs, and founders in particular, are often considered to be optimists and dreamers. This may lead investors to assume founder-CEOs will provide more positively biased forecasts than non-founder-CEOs, while our theory and empirical evidence point to exactly the opposite.

2. Introduction

A key challenge entrepreneurs face is attracting financial resources to grow their firms ([Cassar, 2004](#)). To raise funding, entrepreneurs frequently use impression management (IM) tactics, defined as deliberate efforts to create, maintain, protect, or otherwise alter an image held by a target audience ([Bozeman and Kacmar, 1997](#); [Elsbach et al., 1998](#)). IM tactics can relate to non-verbal signals, such as showcasing awards, dressing professionally, or displaying prototypes ([Clarke, 2011](#); [Zott and Huy, 2007](#)). IM tactics can also be verbally expressed when entrepreneurs interact with prospective resource providers. Carefully crafted entrepreneurial narratives characterized by positive language, depicting the disruptive vision of the firm, help in establishing legitimacy and acquiring financial resources (e.g., [Anglin et al., 2018](#); [Nagy et al., 2012](#); [Pan et al., 2020](#); [Parhankangas and Ehrlich, 2014](#); [Van Balen et al., 2019](#)). On a more negative note, studies have also found entrepreneurs to obscure information or even blatantly lie in an effort to impress investors ([Benson et al., 2015](#); [Pollack and Bosse, 2014](#); [Rutherford et al., 2009](#)). Thus, previous research has firmly established the use and effectiveness of IM tactics adopted by entrepreneurs to acquire financial resources.

However, entrepreneurial investments are not just one-off business transactions. Instead, the investment transaction marks the beginning of an ongoing relationship wherein both social (e.g., advice) and financial resources are exchanged (e.g., [Huang and Knight, 2017](#); [MacMillan et al., 1989](#); [Sapienza et al., 1996](#)). This relationship creates opportunities for entrepreneurs to use IM tactics in ways that have remained underexplored. One key re-occurring event in investor-entrepreneur interactions is the formal presentation of a forecast. Venture capitalists (VCs) typically require entrepreneurs to provide quarterly or yearly forecasts of future firm performance. Such forecasts serve important functions as they capture the promise of good performance or potential advent of poor performance and, by reviewing realized metrics, allow tracking and evaluation. Entrepreneurs may choose to use forecasts as an IM tactic by biasing their forecasts upward. Forecasting IM is highly consequential as it risks undermining the accuracy of the forecast and thus, potentially presents misleading information to investors.

As such, it is important to understand under what conditions entrepreneurs are more likely to use forecasting as an IM tactic. In this study, we examine the role of the CEO and, particularly, whether the CEO is a founder or not. In VC-backed firms, CEOs are not necessarily founders and may instead be recruited, outside CEOs (e.g., [Gerasymenko et al., 2015](#); [Pollock et al., 2009](#); [Wasserman, 2003](#)). CEOs are important to consider because they are the firm's key representative responsible for the interaction with VCs (e.g., [Sapienza and Gupta, 1994](#); [Sapienza et al., 1996](#)). CEOs' decisions to engage in forecasting IM towards investors will likely depend on tactical considerations, balancing the social and financial costs of providing more positively biased forecasts against its benefits.

Combining social exchange theory (e.g., [Blau, 1964](#); [Cropanzano and Mitchell, 2005](#)) with IM literature, we propose that tactical considerations will be different for founders versus non-founders. Founder-CEOs are less likely than non-founder-CEOs to engage in forecasting IM because they identify more with the venture they founded. As a consequence, founder-CEOs experience greater instrumental and affective concerns about the long-term relationship with their VC (e.g., [Arthurs and Busenitz, 2003](#)). While prior entrepreneurship studies on IM have predominantly focused on the positive outcomes to be gained from IM (e.g., legitimacy, funding), a few studies have suggested that IM not only implies benefits, but also costs (e.g., [Benson et al., 2015](#); [Nagy et al., 2012](#); [Rutherford et al., 2009](#)). Adopting a social exchange perspective to IM allows us to provide a more comprehensive depiction of the subtle cost-benefit analysis entrepreneurs make when considering IM. First, social exchange theory hints at longer term considerations that received less attention in IM research focused on initial fundraising and which might be different for founders and non-founders. Second, social exchange theory explicitly brings in a dynamic lens to IM; once the investment has taken place, an investment relationship starts to develop. Social exchange theory helps to explain how relational aspects unfold over time and how these may affect the cost-benefit analysis differently for founders and non-founders. Our focus on forecasting as entrepreneurial IM also informs social

exchange perspectives on the entrepreneur-investor relationship. Our study clarifies how affective and instrumental considerations are closely intertwined and how forecasting, a seemingly instrumental aspect of the relationship, is subtly used to also shape the affective aspects (e.g., trust) of the relationship.

We test our arguments in several ways. Our main analysis relies on a dataset of 320 revenue forecasts reported by 82 firms to their VC from first investment up until exit (or the end of our study's time frame). For robustness, we complemented this dataset with another one, consisting of 148 forecasts reported by 51 firms to their VC. In both cases, we obtained access to the unique proprietary data of a large European VC (from two different countries), which requires its portfolio firms to forecast revenues and report realized revenues annually. In line with our theorizing, we find that forecasts are less positively biased when the CEO is a founder. Finally, we also conducted a causal chain scenario experiment suggesting that, in line with our theoretical arguments, founder-CEOs entertain different tactical considerations than non-founder-CEOs due to their higher identification with the venture. These considerations in turn lead them to provide less positively biased forecasts than non-founder-CEOs.

Our research makes three notable contributions to the entrepreneurship literature. First, while most prior work on IM in entrepreneurship focuses on the pre-investment stage (e.g., Anglin et al., 2018; Benson et al., 2015; Parhankangas and Ehrlich, 2014), we extend this literature by demonstrating that entrepreneurs also use forecasting in an effort to tactically manage their image in ongoing relationships with investors (i.e., post-investment). Contrary to prior evidence on the consequences of IM in the pre-investment stage, supplementary evidence further suggests that entrepreneurs do not get away with forecasting IM post-investment: VCs are more likely to downgrade firms in reaction to more positively biased forecasts and we fail to find evidence that forecasting IM helps in raising a new round of financing.

Second, our study extends IM theory by integrating aspects of social exchange theory, highlighting the costs and benefits of IM considered by CEOs. By taking these cost-benefit considerations into account, a social exchange perspective yields a more relational perspective on why and when entrepreneurs provide overly positive information. As the firm's key representative, who communicates with financial stakeholders, CEOs have received increasing attention as the focal person engaging in IM (e.g., Westphal and Graebner, 2010; Whittington et al., 2016). Indeed, accounting and management scholars have already suggested that CEOs may use forecasts to positively impress investors (e.g., Aguilera et al., 2017; Hayward and Fitza, 2017; Kato et al., 2009; Rogers and Stocken, 2005). We extend this line of research by showing how the tactical considerations made when deciding to engage in IM differ between founder- and non-founder-CEOs. For instance, given their long-term perspective, founder-CEOs may be more concerned about the VC's perception of their trustworthiness and competence. As such, we also add to a dearth of research on the antecedents of IM behavior (e.g., Benson et al., 2015). Moreover, we extend CEO-IM research from public to private firms. Forecasting IM in private firms presents a fundamentally different context as entrepreneurs require longer-term relationships with fewer investors compared to public firms (Brav, 2009; Wright and Robbie, 1998). While the potential for forecasting IM may be larger in private firms because it may be harder to detect, the harm it may cause to the investment relationship may also be larger. Hence, the cost-benefit analysis underlying a CEO's decision to engage in forecasting IM is likely different in private firms.

Third, entrepreneurs have often been cast away as optimists, suggesting any positive bias in forecasts would be the result of those entrepreneurs' cognitive biases (e.g., Busenitz and Barney, 1997; Cassar, 2010; Cooper et al., 1988). We add nuance to this perspective by demonstrating that inflated forecasts are not *solely* the result of cognitive bias, but are also a deliberate, discretionary form of IM that takes into account the CEO's trade-off between the social/financial costs versus benefits of providing more positive forecasts to investors.

3. Theoretical development

3.1. Entrepreneurial forecasts, impression management, and social exchange theory

IM research suggests that a firm's representatives use tactics "to maintain the support of external and internal audiences who are critical to their effectiveness and survival" (Elsbach et al., 1998, p. 68). They may also use IM tactics in an effort to shape the way that external stakeholders view the firm (Westphal and Graebner, 2010). CEOs in particular engage in IM through various channels such as annual reports, conference calls, pitch meetings, investment proposals, strategy presentations, letters to shareholders, and press releases (e.g., Anglin et al., 2018; Arndt and Bigelow, 2000; Benson et al., 2015; Elsbach, 1994; Elsbach et al., 1998; Fiss and Zajac, 2006; Graffin et al., 2011; Martens et al., 2007; McDonnell and King, 2013; Parhankangas and Ehrlich, 2014; Staw et al., 1983; Whittington et al., 2016).

IM tactics can be characterized as direct or indirect, assertive or defensive (Mohamed et al., 1999). Direct tactics include presenting information about the firm's characteristics, accomplishments or abilities; indirect tactics include managing information about activities or connections with which the firm is associated. Assertive strategies are proactive and aim to enhance the firm's image in some particular way; defensive strategies are reactive and are used in response to an event that may damage the organization in some way. While often presenting a mix of direct and indirect IM, most IM research within entrepreneurship has focused on assertive IM — trying to establish a positive image of the firm towards prospective resource providers (e.g., Anglin et al., 2018; Martens et al., 2007; Nagy et al., 2012; Pan et al., 2020; Parhankangas and Ehrlich, 2014; Van Balen et al., 2019; Zott and Huy, 2007). Our study builds on this stream by depicting positively biased forecasts as a form of direct, assertive IM.

Drawing on social exchange theory, which stresses the financial and social costs and benefits to providing positively biased forecasts, we posit that the trade-off between these expected costs and benefits will determine the extent to which entrepreneurs will engage in forecasting IM. The relationship between investors and entrepreneurs has since long been approached as an instrumental one, thereby emphasizing the task-relevant expectations and commitments entrepreneurs and investors have towards one another (e.

g., Drover et al., 2017; Fiet, 1995; Tyebjee and Bruno, 1984; Wright and Robbie, 1998). In exchange for invested capital, an entrepreneur is expected to act in the venture's and investor's best interests, thereby maximizing the VC's return on investment (Huang and Knight, 2017). In exchange for a share of equity and control, an entrepreneur expects an investor to help grow the venture. It is this initial instrumental bond between investors and entrepreneurs that facilitates the exchange of financial resources when the first investment is made (Huang and Knight, 2017).

Social exchange theory, however, holds that the relationship not only comprises instrumental, but also affective bonds (e.g., Blau, 1964; Cropanzano and Mitchell, 2005; Emerson, 1976; Homans, 1958); entrepreneurs and investors have personal and socioemotional expectations and commitments towards one another. More than just a one-off business transaction involving the exchange of financial resources, the relationship will bring an exchange of social resources including advice, support, referrals, enhanced reputation, or simply the feeling of building the next big thing (e.g., Baum and Silverman, 2004; De Clercq and Sapienza, 2006; MacMillan et al., 1989; Sapienza et al., 1996). It is this component that makes them truly value-adding investors (Baum and Silverman, 2004; Fitz et al., 2009).

Within this investment relationship, forecasts play a key role. Investors rely on entrepreneurial forecasts to inform them about the prospects of the venture, and hence their investment (Manigart et al., 1997; Sahlman, 1990). Once an initial investment has been made, yearly forecasts set clear instrumental expectations for the investor on how well the venture will perform in the years to come. Indeed, forecasts are used to measure and keep up the ambition levels of the firm. To use the words of one of the investors we interviewed as part of this project:

First of all, as an investor, you don't want to have a negative plan. Then it just becomes a self-fulfilling prophecy and it will all go even slower than what the plan predicted. So, the plan always has to be ambitious — otherwise I just think the attitude of the company is not ok.

Another investor made a similar point connecting forecasts to ambition levels:

Forecasting even 12 months ahead is difficult in a VC[-backed] company...we typically want to see more than 50% annual growth ... at the end of the day,...you need to have them run fast...the more ambitious they are, the more I like it.

As such, entrepreneurs may be motivated to engage in IM by providing more positively biased financial projections to their existing VCs since there are clear expected financial benefits to conveying a more favorable image. For instance, it may increase the expected likelihood of those investors making additional financial investments in the venture (Cable and Shane, 1997; Sahlman, 1990). More positively biased forecasts may also reduce the expected likelihood of VCs withdrawing their financial support for the venture or CEO. In addition, forecasting may yield social benefits in the form of more investor help or contacts to support the venture's growth, as well as burnishing the CEO's image in the eyes of investors. As the following quote illustrates, entrepreneurs are very much aware of investors' expectations to see high numbers:

If you put in too low, then...You're not ambitious enough. So, you are almost forced to lie... which is annoying. That's the one bit I don't like about...VCs. Forecasts, ours as well, are by definition wrong...[showing us his forecasts:] you can see this 8 Million in 2023, right? If that number was 3 Million, I can guarantee you I have no money. It's as simple as that...so, this 8 Million is an engineered number. It's not that it's wrong...there's a rationale behind it, on how to get there. But by engineered I mean it has to be high enough.

Given the expected benefits, there is a temptation for entrepreneurs to make overly favorable claims about their ventures.

However, there may also be substantial financial and social costs to providing overly positive financial projections. They can lead to misguided and suboptimal investor decision-making; for instance, VCs may wrongly decide to reduce their value-adding services based on the assumption that the entrepreneur does not need them (e.g., Lerner, 1995). Inaccurate forecasting can prompt investors to question the entrepreneur's competence; as further forecasts and actuals are obtained for comparative purposes, he/she may develop a reputation for being a poor forecaster or being untrustworthy. Indeed, evidence abounds that demonstrating commitment, concern, fairness and open communication is key to building trust (Whitener et al., 1998). To this end, accuracy and truthfulness in information flow are important (Colquitt and Rodell, 2011; Mellinger, 1956) and particularly relevant in the context of forecasts for investors. Overly positive forecasts may undermine the VC's trust in the entrepreneur and in turn hamper follow-on rounds by the VC and undermine the relationship as a whole (e.g., Cable and Shane, 1997; Sapienza and Korsgaard, 1996). As the following quotes show, entrepreneurs are very much aware of the potential negative implications overly positive forecasts may have:

Investors use forecasts to check whether you did what you said you were going to do...if you give them too high numbers, you get this skeptical look and "Come on, don't give me this hockey stick approach". And that may turn into "these guys don't know what they are talking about"...it can create a negative perception on you as a team...if you don't reach your numbers, you are kicked out.

Referring to the negative implications on trust, another entrepreneur formulated it as follows:

I think it would just cause a huge lack of trust...I mean, if you would tell me "we are going to do x15", then you will make sure resources are being freed up to do x15. [As an investor,], you then go along in [the story of] "We'll go nationwide, or we'll go to Europe, we'll go onto the radio in 4 markets and we'll open up 2 new offices...let's go!". If then, you only realize a x5... then that just causes a breach of confidence...a lack of trust.

Thus, despite the expected financial and social benefits of providing positively biased forecasts to investors, they can come at a cost: unfounded decision-making, loss of reputation, investors questioning the entrepreneur's competence and ability, all of which undermine trust and the overall relationship in the long term (e.g., Cable and Shane, 1997; Sapienza and Korsgaard, 1996). Moreover,

entrepreneurs typically interact with their investors on repeated occasions and provide information on a regular basis, thereby heightening relational concerns. Indeed, one entrepreneur compared forecasting to VCs to a “sandwich game”: as an entrepreneur you are sandwiched between on the one hand the realization that high numbers are expected to get the support (benefits) of VCs and, on the other hand, the realization of the significant costs of overpromising and underdelivering. Yet, to date, it remains unclear how distinct types of CEOs in entrepreneurial ventures navigate the trade-off between the benefits and costs of providing more favorable forecasts to their existing investors.

3.2. (Non-)founder-CEOs and forecasts as an impression management tactic

In examining the forces that lead firms to provide more positively biased forecasts to their investors, CEOs play a key role as the key decision maker in their firms; they are the ones who have most discretion in directing a firm’s strategy and structure (e.g., Hambrick and Fukutomi, 1991; Miller, 1991; Smith and White, 1987). They communicate in person with financial stakeholders, convincing them of the firm’s strategy and future growth potential (Porter et al., 2004; Westphal and Graebner, 2010), especially in VC-backed firms (Sapienza and Gupta, 1994; Sapienza et al., 1996).

Scholars have recently started exploring how CEOs of public firms try to influence the image of their firms by engaging in IM. For instance, Westphal and Graebner (2010) showed that in response to stock analysts’ negative appraisals of the firm, CEOs strategically increased the board’s formal independence to create an impression of increased board control. Whittington et al. (2016) showed how CEOs, and especially new CEOs, used strategy presentations as an effective way of influencing stock price reactions. These studies suggest that the decision to engage in strategies to influence outsiders’ perceptions of the firm depends not only on the benefits and costs this brings along for the firm, but also on the benefits and costs for the CEO. They also suggest that a deeper analysis of the costs and benefits associated with the specific situation of the CEO is needed to determine how likely s/he is to resort to more positively biased forecasting as an IM tactic.

Research on entrepreneurial IM has suggested entrepreneurs sometimes engage in unethical behavior (e.g., lying or portraying the venture in an overly positive manner) to positively influence investor perceptions of legitimacy and to secure a first round of financing when they believe the benefits of engaging in such behavior outweigh the costs (e.g., Benson et al., 2015; Nagy et al., 2012; Pollack et al., 2012; Rutherford et al., 2009). Founders may be particularly tempted by such behavior in an effort to raise initial funding because of their high organizational identification and the time and effort they have invested in the venture up to that point. In other words, what is at stake for founders may be higher than for non-founders, which may increase the chances of deceptive behavior (Benson et al., 2015).

However, while founders are generally accepted to strongly identify with their ventures, how that stronger identification plays out may be quite different depending on the context considered. When raising a first round of funding from VCs, social exchange theory predicts that instrumental concerns will be key (Huang and Knight, 2017). In other words, entrepreneurs (including founders) may pay less attention to the longer-term implications of their behavior for the investment relationship as the relationship is yet to be started; i. e. the focus is on the short term, getting the deal done. It is only once an investment relationship has been formally established through the exchange of financial resources (i.e. a first round of financing), that differences between founders and non-founders in their long-term orientation become more relevant. We argue that the longer-term focus of founder-CEOs should make them more susceptible to the potential social and financial costs of unethical behavior towards their existing investors, such as when they engage in positively biasing their forecasts.

Hence, in the setting of privately reporting revenue forecasts to VCs, we expect that founder-CEOs will provide less positively biased forecasts to their existing investors than non-founder-CEOs. The main reason for this expectation is that founder-CEOs make different tactical considerations and weigh the social and financial costs associated with providing such overly positive projections to investors more heavily. It is well established that founder-CEOs identify more strongly with their ventures than non-founder-CEOs (Lange et al., 2015; Peterson et al., 2012). Founder-CEOs have a stronger psychological commitment and attachment to their firms (Arthurs and Busenitz, 2003; Wasserman, 2003), and their identity is more closely intertwined with that of the firm (Dobrev and Barnett, 2005). Having been there since the very start, founders see the firm as their baby and an extension of themselves and have developed more intimate firm-specific knowledge that is more difficult to redeploy (Cardon et al., 2005; Wasserman, 2006). Accordingly, founders more highly value their stake in the firm since they have fewer alternatives outside the firm (Jayaraman et al., 2000; He, 2008). Non-founder or professional CEOs, however, have a different career path in mind with many more career options available next to the given firm. Additionally, founder-CEOs tend to own more equity (Nelson, 2003; Wasserman, 2006), which creates a stronger economic link to the firm compared to non-founder-CEOs. As one founder-CEO we talked to highlights:

We are also buying into the dream...so that means, if you are substantially wrong [in your forecast], it is coming out of your dream. So, [providing positively biased forecasts], as a founder-CEO, it’s a bit more sensitive... because it [the venture] is your only dream.

Founders’ stronger organizational identification (e.g., the firm is *their* dream or baby) implies that founder-CEOs tend to consider themselves part of the greater collective, instilling a stewardship attitude. That is, they are intrinsically motivated to adopt a long-term orientation towards maximizing the potential of the firm they brought into existence — if need be, at their personal expense (He, 2008; Peterson et al., 2012; Wasserman, 2006). Consistent with this view, founder-CEOs of public firms were found to engage less in short-termism or managerial myopia as illustrated by them cutting less in their R&D expenditures to meet short-term earnings goals (Schuster et al., 2018). An investment manager we interviewed illustrated this point as follows:

When I talk with founder-CEOs they sometimes tell me, this is a risk, you didn't consider this element, this might happen in the future...if you consider a professional [non-founder] CEO ...the risks we see, are not seen by them or, let me put it differently, ... they [non-founder-CEOs] are less likely to point us to these risks.

Founder-CEOs experience a stronger sense of personal responsibility and accountability compared to non-founder-CEOs. Indeed, because of their stronger organizational identification, founder-CEOs reflect more of a servant leadership style, characterized by personal integrity and a strong moral compass (Peterson et al., 2012). While some studies have suggested strong organizational identification to be associated with a higher likelihood of unethical behavior (e.g., Chen et al., 2016), we argue that as the interests of founder-CEOs tend to be better aligned with the long-term prospects of the firm (than for non-founder-CEOs), they will feel a stronger imperative to forge stable, long-term partnerships with their investors. Providing positively biased forecasts may lead to social and financial benefits, but those benefits will be short-lived, whereas the social and financial costs of providing overly positive financial forecasts to VCs will have longer-term implications — with the latter being more salient, and hence more heavily weighted by founder-CEOs compared to non-founder-CEOs. An experienced financier, now founder-CEO, states:

If you look at me, now, I am actually trying to *not* make it [forecasts] too optimistic ... to not deceive the investors... If you come in as a non-founder-CEO, s/he should come in to make a big splash, right? So, I think that they maybe have the wrong incentives to make it [forecast] higher.

In sum, we posit that founder-CEOs will be more sensitive to the risk of losing investor support (both tangible and intangible) resulting from providing inflated forecasts to their investors. They will also be more concerned about the potential loss of further investment and hence the financial costs associated with providing positively biased forecasts. Taking these tactical considerations into account, founder-CEOs thus should have less incentives than non-founder-CEOs to portray an overly positive image via more positively biased forecasts because the costs loom larger than the expected benefits. As the personal, professional and material fate of non-founder-CEOs is less dependent on the long-term future of the firm, their cost-benefit analysis should be different. As one non-founder-CEO put it:

[Professional CEOs...], they are just a different blood type than founders...I think they are a bit more consciously occupied with their own career planning... they might be a bit more inclined to want to bring good news [optimistic forecasts].

In summary, their greater affective and instrumental concern for the investor relationship makes founder-CEOs less likely to resort to positively biased forecasts as a form of IM. Thus,

Hypothesis 1. Forecasts provided to investors by founder-CEOs will reflect less positive bias (IM) than forecasts provided by non-founder-CEOs.

4. Study 1: field study

4.1. Sample 1

For the purpose of this study, we obtained the cooperation of a large European VC. As of 1999, this investor started recording annual financial accounting information on all its portfolio companies into an internal database. The investor also required the submission of annual financial projections by each of their portfolio companies (i.e. entrepreneurs would provide the forecasts as such, without any additional presentation, with the same reporting frequency irrespective of their performance). Through access to this database, we compiled a sampling frame of 179 participations in private ventures held by the VC between 1999 and 2010.¹ For each of these portfolio companies, we used the VC's internal database to retrieve all available yearly forecasted and realized financial account data starting from the year of investment up to a maximum of 7 years thereafter (data was available up to 2010) or the time of exit.² We excluded those firms for which we only had one observation (29 firms). After also excluding ventures with missing data for the variables of interest (see below), we had a final sample of 82 portfolio companies, representing 320 firm-year observations (ranging from two to eight forecasts per firm). Of these 82, 39 companies had been exited by January 2011.³

Our data originates from a large VC that invests across a typical range of industries and in both new and established ventures. Specifically, most of its investments were in high-tech manufacturing (11.5%), other manufacturing (24.7%), wholesale (14.9%), computer (12.6%) and other services (26.4%). 36.9% of the VC's initial investments were made at start-up, 31.3% at one to 5 years of age, 11.9% at six to 10 years of age and 19.9% at an age of more than 10 years. While this VC's investment scope is broad, given the geographic concentration of our data to Western Europe and the potential for heterogeneity in business practices across VCs, the usual generalizability caveats apply. In 2011, the total amount invested (including follow-on rounds) in that year was €14.8 million and the total amount invested over the VC investor's lifetime was over €100 million. For our sample firms, the average initial amount invested

¹ We excluded investments in real estate, other investment funds and non-profit ventures. We also excluded new investments made in 2010 because we require ex post-realization data and data access was only allowed by the VC up to 2010.

² Note that out of the 179 participations held between 1999 and 2010, in 46 cases initial investments were made prior to 1999. For these companies, data was thus collected from 1999 up to maximum 6 years after investment or exit if earlier than year six.

³ The final sample of 82 companies is representative of our sampling frame with no statistically significant differences in firm age at time of investment ($t = 1.13$, n.s.) and development stage (90% versus 93% had developed a prototype prior to funding, $t = -0.74$, n.s.). Both groups of companies were also similar with regard to industry distribution; other services and other manufacturing are the two most represented industries, whereas agriculture, construction, retail and financial services are the least represented (each containing less than 5% of the subsamples).

was €528,099.

4.2. Measures

4.2.1. Dependent variable

We measure *forecast bias* as the difference between yearly forecasted and realized revenues, divided by the sum of these two (see Cassar (2010) for an identical approach). The forecasting bias observation for year 2005 would thus be calculated based on the revenues forecasted for 2005 and the revenues realized by the end of 2005. In terms of interpretation, the measure ranges from -1 to $+1$. A revenue forecast bias of -1 indicates extremely pessimistic forecasts (e.g., forecasting revenues of 0 EUR, but realizing some instead). A revenue forecast bias of $+1$ indicates extremely optimistic forecasts (e.g., having forecasted revenues but realizing 0 EUR). When forecasted revenues equal realized revenues, then forecast bias would equal zero. The primary advantage of dividing by the sum of forecasted and realized revenues, rather than using only either one, is the reduced susceptibility to extreme values that can occur when forecasting revenues of VC-backed companies. Moreover, by using the approach of Cassar (2010) we ensure theoretical and empirical consistency with prior work. The forecasted revenues are obtained from the VC's internal database and are provided by the entrepreneur to the VC at the start of every year. These forecasts are not revised by or negotiated upon with the VC and remain private. Realized revenues are based on the companies' financial accounts and were also obtained from the VC's internal database.

Our decision to focus on (forecast bias in) revenues is motivated by the fact that higher revenues are a positive outcome, critical to the eventual success of VC-backed companies. Moreover, all financial plans begin with a revenue forecast (and the revenue forecast informs the subsequent components of the financial plan) (Manigart and Meuleman, 2018).⁴ Both entrepreneurs and investors we interviewed confirmed that revenues are the key financial figure VCs are interested in as it represents the key engine for growth. By having a constant forecast horizon of 1 year, we also eliminate any potential influence of the length of forecast horizon on the extent to which forecasts are positively biased.

4.2.2. Independent variables

To test our hypothesis, we identified founder- and non-founder-CEOs. To this end, we combined information from initial business plans submitted to the VC, investment proposals brought to the investment committee, the Amadeus database compiled by Bureau Van Dijk, LinkedIn profiles of the entrepreneurs, company websites, online press articles and official information retrieved from the Chamber of Commerce (i.e., deeds of incorporation and formal changes in leadership). *Founder-CEO* is a dummy variable coded one when the CEO is the founder of the venture (measured 1 year before forecast bias) and zero when the CEO is not a founder.

4.2.3. Control variables

We control for several factors that may influence an entrepreneur's forecasting behavior. Research suggests that as the forecasting task becomes more uncertain, accuracy declines (Kahneman et al., 1982). We therefore include *firm age* (plus 1, measured in years) and *total assets* (in EUR), the two most commonly used controls to capture forecast uncertainty (both ln). Firm age is also commonly used in the literature to control for potential learning effects in forecasting. On average, firms in our sample are 15 years old and have €4.9 million in total assets. We also include a control for the *number of entrepreneurs* and include *industry* fixed effects (high-tech manufacturing; other manufacturing (reference category); transportation, communication, electric, gas and sanitary services; wholesale trade; retail trade; computer services; other services) to control for industry heterogeneity.⁵ To control for potential time-varying incentives to bias forecasts we use the variable *new VC round*, coded one if the firm raised financing in the year under consideration, and zero otherwise. A new round occurs in 30% of our forecast years. Additionally, we control for *time since investment* (expressed in years) as this may also influence the cost-benefit tradeoff CEOs make. Given our sample restrictions, this variable ranges between zero and seven years. The degree of monitoring is captured by the presence of a VC on the *board of directors*. This variable is dynamic in that we noted the presence or absence of a VC on the board for every one of the relevant forecast years. A VC is on the board in 38% of our forecast years. We also include calendar *year* fixed effects to control for time-varying biases as economic conditions and sentiment are generally positively associated over time.

4.3. Econometric approach

Whether or not a given firm has a founder- or non-founder-CEO may be influenced by unmeasured variables, which may impact forecast bias. To address this potential endogeneity problem, we ran a two-stage Heckman model (e.g., Wolfolds and Siegel, 2019). A first-stage probit model predicts the probability of a founder-CEO being in charge. Firm-level variables are to some extent endogenous to choices made by the firm, thus we considered an industry-level measure as exclusion criterion, which is commonly argued to be more plausibly exogenous to an individual firm (e.g., Duchin et al., 2010). As exclusion criterion in the first stage, we use the *industry-level reliance on non-founder-CEOs* (results presented in Table 2, Model 1). Similar to the approach by Hsu (2004), we argue that the industry-level reliance on non-founder-CEOs in the selection equation is likely to act as a good instrument because this characteristic is

⁴ Variable costs, for example, relate directly to sales and in forecasting one often uses "the percent-of-sales-methods" to estimate other components in the financial plan.

⁵ Industries were coded based on the portfolio companies' primary two-digit SIC codes. Based on Carpenter and Petersen (2002), we define high-tech manufacturing as corresponding with SIC 28, 35, 36 and 38.

not relevant in the second-stage analysis (i.e. when predicting forecast bias) as it is absorbed by the industry fixed effects. We then included the correction variable resulting from the first model, the *inverse Mills* ratio, as a control in our second-stage regression models (Heckman, 1979).

For the second-stage models, consistent with prior research using unbalanced panel data (e.g., Philippe and Durand, 2011; Yang et al., 2014), we use feasible generalized least squared (FGLS) regression models controlling for heteroskedasticity. We also computed the Sargan-Hansen (SH) statistic, using robust standard errors (as an alternative to the traditionally used Hausman test given that the latter is not robust to heteroskedasticity). A random effects estimator was preferred to a fixed effects one as the SH test yielded a statistically non-significant result (SH = 19.61, Chi-square = 17, $p = .295$), supporting the use of random effects. We therefore relied on FGLS with heteroskedasticity consistent standard errors (Wooldridge, 2002).⁶

4.4. Results

Table 1 reports the means, standard deviations and correlations of all relevant variables, except for calendar year and industry dummies. Consistent with entrepreneurs generally providing positively biased revenue forecasts to investors, the overall unconditional mean revenue forecast bias is 0.10 (s.d. 0.23, $p < .001$, 95% confidence interval [0.07–0.12]), with 68.44% (31.56%) over(under) estimating one-year-ahead revenues. The unconditional mean revenue forecast bias in year 0 is 0.16 (s.d. 0.30, $p < .001$, 95% confidence interval [0.08–0.24]). Moreover, in line with our ex-ante concerns of deflator-induced skewness, if we deflate the difference between yearly forecasted and realized revenues by realized revenues, instead of symmetric deflation, the resultant revenue forecast bias is highly positively skewed with a mean of 6.05 (s.d. 81.96, max 1436.13). The variance inflation factor (VIF) score was below 5 for our hypothesized independent variable suggesting that multicollinearity is not a cause for concern for our empirical testing.

Table 2 presents the results of our selection model (Model 1) and of our FGLS analyses (Models 2 and 3). Model 2 includes control variables only. In Model 3 we add the main effects.

H1 relates to whether the CEO status as a founder or non-founder influences forecasting IM to investors. Model 3 shows a statistically significant negative relationship between founder-CEO and the extent of positive bias in forecasts. This implies that, as predicted, founder-CEOs provide significantly less positively biased forecasts to their investors. Specifically, holding all other variables at their means, the positive bias in forecasts drops from 0.12 when provided by non-founder-CEOs, to 0.07 when provided by founder-CEOs. A value of 0.12 on positive forecast bias represents an overshooting by about 27% of the realized revenues, whereas a value of 0.07 on forecast bias corresponds with an overshooting by about 15% of the realized revenues.⁷ These statistics demonstrate the material difference in positive forecast bias provided by founder- versus non-founder-CEOs to their VC investors.

4.5. Supplementary analyses

4.5.1. Endogeneity

Following recent recommendations (e.g., Frank, 2000; Larcker and Rusticus, 2010), we tried to estimate the extent to which endogeneity may present a problem for our current study. In particular, we wanted to assess how strong a correlated omitted variable would have to be to overturn our results, so we calculated the impact threshold of a confounding variable (ITCV) for our founder-CEO variable (Frank, 2000). The results show an ITCV of 0.015, which implies that partial correlations between founder-CEO and forecast bias with an omitted confounding variable would have to be about 0.124 to overturn the results. To put this in perspective, it would take a correlated omitted variable with an impact as large as all but one variable in this model (namely company age) to overturn our results. Assuming that we have a reasonable set of control variables, this suggests that our results are unlikely to be driven by a correlated omitted variable.

4.5.2. VC reactions

Prior research on IM in entrepreneurship suggests that entrepreneurs can and often do successfully use IM tactics to raise initial funding. However, such tactics might work differently once entrepreneurs are in a relationship with an investor. We therefore examine the impact of providing positively biased forecasts to investors on the VC's risk assessment of their portfolio firms and on those portfolio firms' ability to raise follow-on funding. Regarding risk assessment, the responsible investment managers assess the risk of each of their portfolio companies biannually. This assessment is translated into a score ranging from one to five, with one indicating the venture representing a relatively limited risk for the VC and five indicating a high risk for the VC. To capture the VC's reaction to positive forecast bias, we use the difference in risk assessment score provided at the end of the year when forecast bias can be observed (i.e. when we measure realized revenues) and the score from the year before. This variable ranges from -1 (i.e. an upgrade) to $+2$ (i.e. a downgrade). Follow-on funding is captured by a dummy variable which takes on the value of one in case the venture raises a new round in the year when forecast bias can be observed, and zero otherwise.

These supplementary results suggest that entrepreneurs who provide more positively biased revenue forecasts will get a higher risk score, that is, they get downgraded ($p = .019$). Such a downgrade can be very impactful because it might entail that the VC considers

⁶ Note that we do not assume contemporaneous correlation as the time period (T) – which in our case ranges from 2 to 8 – is significantly smaller than the number of cross-sectional units (N, in our case 82) (Beck and Katz, 1995).

⁷ To get to the % of overshooting of realized revenues, one takes $(1 + [\text{number of forecast bias}]) / (1 - [\text{number of forecast bias}])$. For instance, a forecast bias of 0.12 would lead to $1.12/0.88 = 1.27$, or hence an overshooting of realized revenues by 27%.

the portfolio firm as a write-off and will not invest further in the relationship. Consistent with our focus on revenue forecasts and evidence from exploratory interviews that VCs often focus on topline (revenue) forecasts, we find that while they do react to positively biased revenue forecasts in terms of their risk assessment, we fail to find evidence that they react to positively biased gross profit forecasts. Interestingly, we also fail to find evidence that entrepreneurs who provide more positively biased revenue (gross profit) forecasts are more likely to obtain a follow-on funding round ($p = .910$ and $.819$, respectively). Overall, once entrepreneurs are in a relationship with investors, these results suggest that entrepreneurs might not get away with providing positively biased forecasts.

4.5.3. Robustness checks

The average company in our sample is 15 years old. While research would suggest founder behavior and influences to be rather persistent over time, we acknowledge the company age range is rather broad in our sample. Therefore, we also reran our analyses limiting our sample to only include those companies with an average age of 7 years. While doing so results in a loss of 61 observations, our results are in fact even stronger than for our full sample ($p = .002$). However, as all companies in our sample can be considered growth-oriented (e.g., they all applied for VC within maximum 7 years of the time we observed them), we consider it more accurate to keep the older firms in.

In addition, while both our interviews and the VC reaction models confirm revenues are the more relevant financial metric to look at, we also reran our main models using forecast bias in gross profit as a dependent variable. Again, results are entirely consistent with our main models ($p = .037$).

4.6. Sample 2: a replication study

To rule out the possibility that our findings are simply the artefact of having focused on one particular VC, we gathered similar data from a second VC, located in a different country (also in Europe). This additional dataset is an unbalanced panel dataset of 150 firm-year observations containing annual financial information for the 2013–2017 period. Similar to Sample 1, the VC required the submission of annual forecasts by each of its portfolio companies. After excluding one venture with missing data for the variables of interest, the final sample consisted of 51 portfolio companies (no overlap with Sample 1), representing 148 firm-year observations. Of these companies, 19 had been exited by December 2017. Portfolio companies operate in the typical range of industries, including manufacturing, ICT, retail, energy, and life sciences. All investments were geographically concentrated in Western Europe, i.e. Belgium, Netherlands, Germany, France, and Switzerland. Variables were measured in the same way as in Sample 1. We also used the same control variables as in Sample 1 with the exception of number of entrepreneurs (due to lack of data availability). In Appendix 1, we included Table 3 and Table 4, summarizing the descriptive statistics and results, respectively. The results are entirely consistent with Sample 1: founder-CEOs were again found to be significantly less likely to engage in forecasting IM towards their VCs ($p = .035$).

5. Study 2: a causal chain experiment

In line with our theorizing, data from two samples in Study 1 suggest that CEOs positively bias forecasts as an IM tactic with founders providing less positively biased forecasts to investors than non-founders. Our theorizing argued that, because founder-CEOs psychologically identify more with their firm than non-founders, they would entertain different tactical considerations when

Table 4
Study 1, Sample 2, results from FGLS regression analysis^a.

	Revenue forecast bias ^c	
	Model 1	<i>p</i> -values
Constant	0.155 (0.050)	0.002
Firm age ^b	0.008 (0.007)	0.233
Total assets ^b	−0.030 (0.006)	0.000
New VC round	−0.014 (0.014)	0.336
Board of directors	0.037 (0.023)	0.107
Time since investment	0.002 (0.002)	0.169
Founder-CEO	−0.019 (0.009)	0.035
Industry dummies included	Yes	
Year dummies included	Yes	
N	148	
Wald χ^2	323.60	0.000

^a Two-tailed tests, heteroskedasticity-consistent standard errors are between brackets.

^b Logarithm.

^c Number of firms = 51.

Table 1
Study 1, Sample 1, descriptive statistics and correlations^a.

Variable	Mean	s.d.	1	2	3	4	5	6	7	8
1. Firm age ^b	2.21	1.06	–							
2. Total assets ^b	14.24	1.74	0.56	–						
3. Number of entrepreneurs	1.63	0.80	–0.12	–0.02	–					
4. New VC round ^c	0.30	0.46	–0.29	–0.08	0.19	–				
5. Board of directors ^c	0.38	0.48	0.51	0.64	–0.10	–0.11	–			
6. Inverse mills	0.41	0.38	0.80	0.52	0.07	–0.12	0.39	–		
7. Time since investment	1.09	0.65	0.36	0.21	–0.18	–0.47	0.17	0.12	–	
8. Founder-CEO ^c	0.76	0.43	–0.68	–0.44	–0.01	0.10	–0.34	–0.80	–0.08	–
9. Forecast bias	0.10	0.23	–0.30	–0.25	0.08	0.11	–0.24	–0.21	–0.15	0.12

^a Number of observations = 320. Correlations as of 0.12 (in absolute values) are significant at $p < .05$. Year and industry dummies are not reported.

^b Logarithm.

^c Dummy variable.

Table 2
Study 1, Sample 1, Results from Probit and FGLS regression analyses^a.

	1st stage probit estimate CEO founder selection model		2nd stage FGLS analysis of forecast bias ^c			
	Model 1	p-Values	Model 2	p-Values	Model 3	p-Values
Constant	7.696 (2.308)	0.001	0.360 (0.083)	0.000	0.387 (0.083)	0.000
Industry reliance on non-founder-CEOs	–2.235 (0.598)	0.000				
Firm age ^b	–1.139 (0.252)	0.000	–0.025 (0.013)	0.044	–0.035 (0.013)	0.009
Total assets ^b	–0.169 (0.152)	0.266	–0.016 (0.005)	0.004	–0.014 (0.005)	0.010
Number of entrepreneurs	–0.222 (0.237)	0.351	0.003 (0.008)	0.705	0.006 (0.008)	0.468
New VC round	0.059 (0.298)	0.844	–0.002 (0.012)	0.850	–0.006 (0.013)	0.631
Board of directors	0.131 (0.550)	0.812	–0.004 (0.018)	0.813	–0.004 (0.018)	0.832
Time since investment	0.042 (0.082)	0.610	–0.010 (0.003)	0.001	–0.009 (0.003)	0.004
Inverse mills					–0.005 (0.015)	0.733
Founder-CEO					–0.047 (0.024)	0.049
Industry dummies included	No		Yes		Yes	
Year dummies included	Yes		Yes		Yes	
N	320		320		320	
Wald χ^2	148.10	0.000	138.47	0.000	180.60	0.000

^a Two-tailed tests, heteroskedasticity-consistent standard errors are between brackets.

^b Logarithm

^c Number of firms = 82.

developing and presenting their forecast. Study 2 was designed to test these arguments more explicitly: Does founder-CEOs' higher identification with their firm lead to different tactical considerations when developing forecasts and do these different considerations, in turn, lead to less positively biased forecasts?

To test these mechanisms, we conducted two experiments using a vignette methodology-approach (Aguinis and Bradley, 2014). Although the vignette methodology seemingly lacks real-world validity, it can be effective in complementing field data (e.g., Study 1) to uncover causal mechanisms in entrepreneurial decisions (e.g., Souitaris et al., 2020). Because our goal was to uncover the psychological process underlying the different forecasts provided by founder- versus non-founder-CEOs, we followed an experimental-causal-chain approach (Spencer et al., 2005). Adopting a double randomization design (Pirlott and MacKinnon, 2016), we used a two-step approach to test each link in the assumed causal chain from high organizational identification to providing less positively biased forecasts. In a first online experiment, entrepreneurs were presented with a vignette in which they were randomly assigned to conditions of high versus low organizational identification and we measured their subsequent tactical considerations regarding IM. Then, in a second online experiment, another sample of entrepreneurs was presented with a vignette in which we randomly assigned them to two different conditions of tactical considerations, and we measured their forecasts as the dependent variable.

Testing a process in entrepreneurship is often done by conducting a single study that identifies independent variables and then measures mediating and dependent variables. This approach, “measurement-of-mediation”, suffers from potential shortcomings that a causal chain experimental approach can (better) address (Spencer et al., 2005). First, measurement of a process variable may

contaminate the measurement of the dependent variable, or vice versa (Spencer et al., 2005). Given that it is not socially desirable to report tactical IM considerations, measurement of this process may actually prevent the outcome variable, positively biased forecasts, to occur altogether, or to unintentionally prime the process in all participants. Second, “measurement-of-mediation” designs do not always provide clear evidence of temporal precedence of the hypothesized variable to the outcome variable (Pirlott and MacKinnon, 2016). Through experimentally manipulating tactical considerations, we can provide evidence that tactical considerations precede forecast bias temporally and cause forecast bias. Thus, a double randomization design has the potential to “provide stronger and more rigorous evidence” of causal relationships (Pirlott and MacKinnon, 2016, p. 37).

5.1. Experiment 1

5.1.1. Sample

We collected our data using Prolific (e.g., Palan and Schitter, 2018). Prolific is a web-based crowdsourced data collection platform, which allows detailed and rigorous screening criteria to ensure that recruited respondents fit the aims of a specific research question. Previous research has used Prolific samples to experimentally study entrepreneurial and managerial decision-making (e.g., De Cremer et al., 2018; Engel et al., 2019; Van Balen et al., 2019). We used multiple screening criteria on the platform itself by recruiting only participants who were fluent in English, had a 95% approval rate on Prolific, and indicated having entrepreneurial experience (i.e. they are currently running or have had their own business). The latter was deemed necessary so participants would be familiar with the characteristics and nature of investment relationships. After cleaning data for incomplete responses, we deleted two cases where respondents did not answer the attention checks correctly. Our final sample consisted of 210 participants, 105 in each condition (49% female, M age = 36, SD = 11.85). On average, they reported having 4.37 years (SD = 5.59) of entrepreneurial experience and 13.90 years (SD = 10.90) of work experience.

5.1.2. Materials

We presented participants with a scenario (vignette) that portrayed them as a founder- or non-founder-CEO of an entrepreneurial venture. We described and merged several aspects of identification with the venture (e.g., founder role, length of the bond with venture idea, intrinsic reward, extended self), into a single description to create the two conditions, i.e. high versus low organizational identification (see description of vignettes in Appendix 2). Next, participants in both conditions were informed that a major investment firm had made an initial investment in their venture and that each year they needed to communicate revenue forecasts to the investors. The forecast was explained to be important to ensure the investor has a favorable impression of the financial prospects of the firm. Participants were explicitly instructed as follows: “Imagine you were the CEO in this scenario”.

5.1.3. Measures

To test if our manipulation was successful, we first measured *organizational identification* with six items from Mael and Ashforth (1992) on a 5-point agree-disagree Likert scale. Example items were “When someone criticizes the firm, it feels like a personal insult”, and “This firm’s successes are my successes”. Reliability of the scale was $\alpha = 0.85$. A higher score on the scale reflected stronger identification with the firm.

Next, participants were introduced to the focal outcome variable, *tactical considerations*. They were asked, when developing and presenting a forecast for the investors, to what extent they agreed on a 5-point Likert scale with six tactical consideration items. We adapted the items from a scale designed to measure tactical considerations in information exchange (Poortvliet et al., 2012) to the current forecasting context. The items were: “I hope the investors find me trustworthy”, “I want to appear competent to the investors”, “I find it important that the investors have confidence in my forecast”, “I want to make sure that the investors find me a credible forecaster”, “The investors would not be able to assess if my forecast was inaccurate” (reverse coded). On the basis of our interviews with entrepreneurs and investors, we added “I want to appear ambitious to the investors” (reverse coded). Reliability of the scale was $\alpha = 0.75$. A higher score on the tactical considerations scale reflects a stronger emphasis on the potential costs associated with engaging in forecasting IM.

5.1.4. Results

The manipulation check was successful. Participants in the high organizational identification condition ($M = 4.54$, $SD = 0.48$) reported stronger organizational identification than participants in the low organizational identification condition ($M = 3.88$, $SD = 0.80$), $F(1, 208) = 53.17$, $p = .000$, $\eta^2 = 0.20$. Next, we conducted a one-way ANOVA to test the effect of the organizational identification manipulation on tactical considerations. Participants in the high organizational identification (i.e. founder-CEO) condition reported higher tactical considerations ($M = 4.56$, $SD = 0.38$) than participants in the low organizational identification (i.e. non-founder-CEO) condition ($M = 4.35$, $SD = 0.61$), $p = .004$, $\eta^2 = 0.04$. Thus, Experiment 1 shows that high organizational identification (i.e. founder-CEO condition) results in higher tactical considerations, i.e. a higher concern regarding the potential costs of engaging in forecasting IM, as compared to low organizational identification (i.e. the non-founder-CEO condition).

5.2. Experiment 2

5.2.1. Sample

We collected the data using the same online platform (Prolific) and procedure as in Experiment 1. We also excluded participants from Experiment 1 from being able to participate in Experiment 2. After cleaning the data for incomplete responses, we deleted two

cases where respondents did not answer the attention checks correctly. Our final sample consisted of 198 participants, (49% female, M age = 36, SD = 11.85), with 96 and 102 participants across conditions. On average, participants reported 7.26 years (SD = 7.37) of entrepreneurial experience and 14.46 years (SD = 10.84) of work experience.

5.2.2. Materials

We presented participants with a similar scenario as in Experiment 1, again portraying them as the CEO of an entrepreneurial venture, this time without mention of founder or non-founder roles. After explaining that a major investment firm had made an initial investment in their venture and that each year, they needed to communicate revenue forecasts to the investors, we adapted the scenario to manipulate tactical considerations. Participants were told that, while developing the report to present a forecast to the investors, they were considering the implications of that forecast. We then used the content of the six tactical consideration items of Experiment 1 to depict potential considerations while developing the forecast (see description in Appendix 2). After a manipulation check, participants were asked to imagine themselves in the role of the CEO and develop a forecast for the investors on the basis of a best revenue estimate provided in the scenario.

5.2.3. Measures

To test if our manipulation was successful, we first measured *tactical considerations* with three self-constructed items on a 7-point Likert scale from not important at all to extremely important: “how important is it that the investors have confidence in your forecasts?”, “how important is it that the investors find you trustworthy and credible?”, and “How important is it that you appear extremely ambitious through your forecasts?” (reverse coded). Reliability of the scale was $\alpha = 0.77$. A higher score on the scale reflected higher tactical considerations regarding engaging in forecasting IM.

Next, participants were introduced to the focal outcome variable, the *forecast*: “Given the current growth of your company, revenues for next year could be anywhere in between \$750,000 and \$900,000. Your best estimate for next year’s revenues is \$800,000. Indicate on the below slider the revenue forecast you would present to your investors”. On a slider ranging from \$700,000 to \$1,000,000 participants could indicate the precise forecast they intended to present to investors. A score higher than the best estimate reflects positively biased forecasts.

5.2.4. Results

The manipulation check was successful. Participants in the high tactical considerations condition ($M = 5.74$, $SD = 0.83$) effectively reported higher tactical considerations than participants in the low condition ($M = 3.80$, $SD = 1.49$), $F = (1194) = 128.82$, $p = .000$, $\eta^2 = 0.40$. Next, we conducted a one-way ANOVA to test the effect of the tactical considerations manipulation on the forecast. Participants in the high tactical considerations condition reported a lower forecast ($M = \$822,064.03$, $SD = \$45,533$) than participants in the low tactical considerations condition ($M = \$846,474.14$, $SD = \$53,893$), $p = .001$, $\eta^2 = 0.06$. Thus, Experiment 2 shows that participants in both conditions presented positively biased forecasts (i.e. above the best estimate), but participants in the high tactical considerations condition were more moderate in their forecast and presented a significantly lower forecast than participants in the low tactical considerations condition. Together, Experiment 1 and Experiment 2 provide support for our argument that founder-CEOs who strongly identify with their ventures have different tactical considerations than non-founder-CEOs when presenting forecasts to their investors and these tactical considerations in turn lead founder-CEOs to provide less positively biased forecasts.

6. Discussion

In this study, we integrated social exchange theory with IM literature to examine to what extent entrepreneurs positively bias their post-investment forecasts to investors to present a favorable image. On the basis of two unique large European VC firm databases comprising longitudinal data on the forecasted and realized revenues of their portfolio companies, we found evidence for positive bias in forecasts. Consistent with our conceptualization of positively biased forecasts as an IM tactic, we found that forecasts were less positively biased when the CEO was a founder compared to a non-founder. This pattern was replicated across databases, which bodes well for the robustness of the effect. Evidence from an experimental scenario study shed further light on the assumed mechanism underlying this pattern: Founder-CEOs who strongly identify with the firm were found to entertain different tactical IM considerations than non-founder-CEOs and these tactical IM considerations, in turn, were responsible for less positively biased forecasts amongst founder-CEOs.

6.1. Contributions

It is well established that entrepreneurs adopt IM tactics prior to investment to create a positive image of their venture and to gain access to financial resources. Our study adds to prior research on IM in entrepreneurship by providing novel theoretical and empirical insights on how entrepreneurs adopt IM post-investment. Such a focus is important because, once the investment has taken place, entrepreneurs need to carefully balance the benefits of presenting themselves more positively with the risk of jeopardizing the long-term relationship if their forecasting IM would be detected. Our results suggest that founder-CEOs balance these benefits versus costs differently from non-founder-CEOs. In particular, founder-CEOs seem to weigh the expected costs of engaging in forecasting IM more heavily (i.e. they score higher on tactical IM considerations) than non-founder-CEOs. In so doing, we first show that entrepreneurs engage in IM through the forecasts they provide to their investors. We also shed light on the considerations that drive entrepreneurs to engage in forecasting IM and how these considerations differ depending on the founder status of the CEO. Adding to the dearth of

research related to antecedents of IM, this study is amongst the first to provide a finer-grained view on the mechanisms at play in the entrepreneur's decision to engage in IM.

Whereas CEOs have received increasing attention within IM research as the focal person engaging in IM, their founder status has thus far remained unexplored as a potential driver of their incentives to do so. Whereas the importance of founder status is generally recognized within the entrepreneurship literature, the consequences of this status are not always straightforward. For instance, the CEO-founder literature offers substantial and consistent evidence that founder-CEOs are more susceptible to cognitive biases, such as overconfidence, than their non-founder counterparts (e.g., [Busenitz and Barney, 1997](#); [Forbes, 2005](#); [Lee et al., 2017](#)). This observation would imply that founder-CEOs may be more likely to provide positively biased forecasts than non-founder-CEOs, i.e. the opposite of what we argue and find. Similarly, the stronger organizational identification of founder-CEOs suggests they might be more likely to want to protect their ventures at all cost. This could also imply providing more positively biased forecasts, with the goal of retaining and possibly even increasing their investors' support. Our findings, in fact, do not contradict either view. Founders may still privately hold more overconfident beliefs than non-founders and founders may indeed see and recognize the benefits of engaging in forecasting IM. However, our results do show that founder-CEOs have a greater concern for the financial and social costs of engaging in forecasting IM, which outweighs the perceived potential short-term benefits to be gained, as well as the impact of individual cognitive biases. Combined, we thus not only provide deeper insight into the conditions under which entrepreneurs engage in more IM, but we also add nuance to the view of founders as eternal dreamers and naïve optimists. In fact, our results would point to a much sager founder than typically assumed, making a conscious and deliberate analysis of the benefits and costs of engaging in IM towards investors.

Interestingly, our supplementary analyses show that once entrepreneurs are in a relationship with an investor, they do not get away with (forecasting) IM. Specifically, our results suggest that entrepreneurs who provide positively biased forecasts are more likely to get downgraded. We also fail to find evidence that more positively biased forecasts would increase chances of follow-on fundraising. This result provides an interesting contrast to prior pre-investment IM research, which has revealed that entrepreneurs are not penalized for their IM tactics as it helps them in successfully raising their first round of funding. Clearly, there are different relational dynamics at play once this first round of funding has been secured. Yet, more research disentangling how the dynamics between investors and entrepreneurs change over the course of their investment relationship, and how these changes may affect both parties' behaviors towards one another is warranted.

Finally, we add to the entrepreneurial finance literature. Whereas monitoring has since long been proposed as a key activity part of the VC-entrepreneur relationship (e.g., [Arthurs and Busenitz, 2003](#); [Sapienza and Korsgaard, 1996](#)), relatively little is known about the exact information exchanged between VCs and their portfolio companies over the course of the investment relationship. With this study we shed some light on the black box of investor-entrepreneur information flows. Moreover, while VCs have often been described as effective monitors (e.g., [Gompers, 1995](#); [Lerner, 1995](#)), very little research to date has explicitly explored or tested this proposition. The supplementary analyses mentioned above support the 'good monitor' assertion by showing that entrepreneurs do not get away with IM and, in fact, even get punished for it in the form of receiving a risk downgrade from their VCs.

6.2. Limitations and avenues for future research

As with any study, our study is subject to limitations. First, we examined one specific IM tactic in isolation, namely the provision of positively biased forecasts. Entrepreneurs may also combine different IM tactics (including verbal IM tactics, for instance), which could reinforce or weaken the value of forecasting IM. While the predefined format in which forecasts were provided in Study 1 and our experimental study should ease the concern that other IM tactics may affect our results, future work could further unravel how entrepreneurs combine distinct post-investment IM tactics and how such a combination impacts their effectiveness.

Additionally, our focus on one specific IM tactic also implied a focus on one-year-ahead forecasting. Investors may, however, also require entrepreneurs to forecast their revenues for three or even five years ahead. One could expect the extent of positive bias in forecasts to be even larger in such longer-term forecasts as it would generally become much harder for investors to assess those forecasts and hence for entrepreneurs' deception to be detected ([Benson et al., 2015](#); [Rogers and Stocken, 2005](#)). Longer-term forecasts will likely also be more positively biased compared to one-year-ahead forecasts as individuals simply tend to become substantially more positive in their predictions when thinking about the future ([Trope and Liberman, 2010](#)). Yet, even for longer-term forecasts, research on public firms would suggest that considerations regarding, for instance, credibility may still work to constrain self-serving tendencies (e.g., [Faurel et al., 2018](#)). Based on our theorizing regarding founder- versus non-founder-CEOs' tactical considerations, we would still expect founder-CEOs to be more conservative than non-founder-CEOs when providing longer-term forecasts to investors.

Second, while our mixed-methods approach and the consistent evidence across studies provides very strong and robust support for our hypothesis, we also recognize that our individual studies are not without limitations. Considered on its own, each of the individual studies may suffer from design-specific weaknesses. For instance, our main field study (Study 1) could be criticized for lack of generalizability as it exclusively relies on data gathered from one VC. However, the replication study we conducted using data from a different VC in a different country and with data from a different time period should help to alleviate that concern. We also note that when data from both samples are combined into one overarching sample, results remain robust (and are, in fact, even stronger). While both samples of Study 1 support our hypothesized main effect, on its own Study 1 does not provide explicit evidence of the underlying assumed tactical considerations mechanism. Indeed, founder-CEOs may also provide less positively biased forecasts than non-founder-CEOs because they may be less overconfident, may be better at the forecasting task at hand or operate in less uncertain environments. As explained above, prior research would make the first alternative explanation unlikely as founders have been shown to be more rather than less overconfident than non-founders (e.g., [Busenitz and Barney, 1997](#); [Forbes, 2005](#); [Lee et al., 2017](#)). To address potential differences in the difficulty of making forecasts, we included controls for firm-level factors (e.g., firm age, industry, time period).

Finally, Study 2 relied on randomly assigned participants and provided support that the identified causal link was (at least) one key causal factor in driving the different forecasting pattern.

While the double randomization vignette design we adopted provides preliminary evidence for the assumed causal pathway (Pirlott and MacKinnon, 2016), it also has some limitations. One such limitation is that we cannot rule out the possibility of other causal paths, i.e. beyond tactical considerations. The manipulation of organizational identification may also trigger other psychological responses (e.g., diligence) that could play a role in the different forecasts of founder- versus non-founder-CEOs. Future research could explore whether other such causal paths exist, as well as their relative importance in explaining forecasting IM. Moreover, while the double randomization approach in our vignette study allows an understanding of the causal relationship between organizational identification and tactical considerations, and tactical considerations and forecast bias, it does not allow to assess the entire indirect effect, as more traditional approaches to measurement-of-mediation would allow. Also acknowledging weaknesses of vignette experiments (e.g., potential demand characteristics, lack of ecological validity, Aguinis and Bradley, 2014), future research may want to adopt laboratory or field experiments that are better suited to more formally test the full mediational process, such as concurrent double randomization designs (e.g., Imai et al., 2013; Pirlott and MacKinnon, 2016).

Third, while we find evidence that entrepreneurs engage in forecasting IM post-investment, we also find that entrepreneurs do not get away with such behavior. Specifically, they get a higher risk classification and we fail to find evidence that the probability of raising follow-on funding increases. This raises the question why entrepreneurs then engage in IM post-investment to begin with? One possibility is that entrepreneurs *expect* benefits from IM, but do not envisage that investors can actually detect their IM. Another possibility is that post-investment forecasting IM provides other benefits that we did not capture such as larger amounts of funding or more interesting terms for funding rounds (e.g., higher valuations).

Finally, in line with the majority of the IM literature, we assume entrepreneurs are mainly interested in portraying a maximally positive image of their firm. However, there may be circumstances when they have an incentive to do the opposite, i.e., portray a negative image. Shepherd and Haynie (2011), for example, showed how some entrepreneurs stigmatized by their firm's failure would engage in IM even if that meant adopting a negative view of themselves. Future research that unlocks when and why entrepreneurs intentionally provide more conservative forecasts to their investors would be valuable.

6.3. Practical implications

Our findings have practical implications for investors and entrepreneurs alike. Founders are typically described as the big dreamers, whereas non-founder-CEOs get labeled as “professional” CEOs. It seems non-founder-CEOs are assumed to have a higher ability and ambition than founder-CEOs, making them worthy of the term “professional”. To use the words of an investor we interviewed, “We all know the one-liner ‘Sell the dream, sell the customer, sell the spreadsheet’...I would hope managers [non-founders] are more on the sell the spreadsheet side than the sell the dream side.”. However, it was also interesting to note that several founder-CEOs and investment managers we talked to highlighted that our results are actually in line with their situation or with what they have observed (i.e., that founders are less likely to engage in forecasting IM because founders more heavily weigh the financial and social costs of engaging in forecasting IM, relative to non-founders). Accordingly, our study points to a need for creating a more nuanced picture of founders versus non-founders amongst both entrepreneurs and investors.

Additionally, evidence from practice suggests that investors espouse the view of entrepreneurs in general as optimists, as evidenced by their standard application of a discount to entrepreneurial forecasts to correct for optimism bias. According to the renowned investor Guy Kawasaki, “An entrepreneur’s projections are never conservative. If they were, they would be \$0... As a rule of thumb, when I see a projection, I...multiply by .1” (Kawasaki, 2006). Our study is the first to provide insight into the extent of optimism that entrepreneurs display in the forecasts they provide to their investors: on average, such forecasts overshoot realized revenues by about 22%. While substantially overoptimistic, it is far less optimistic than those widely spread discounts would imply.

Our IM account of forecasts also implies that one standard optimism discount is not helpful for dealing with this phenomenon. A one-size-fits-all approach may in some cases result in substantially overestimating the extent to which forecasts are positively biased, while in other cases they may substantially underestimate the true extent of the problem. Indeed, our results suggest that rather than using a single optimism discount, investors should tailor the discount depending on the type of CEO they interact with and, all else equal, the optimism discount applied should be higher for forecasts from non-founder-CEOs relative to founder-CEOs.

CRediT authorship contribution statement

Veroniek Collewaert: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing. **Tom Vanacker:** Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing. **Frederik Anseel:** Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing. **Dries Bourgois:** Methodology, Formal analysis, Investigation, Writing - review & editing.

Appendix 1: replication study

Table 3

Study 1, Sample 2, descriptive statistics and correlations^a.

Variable	Mean	s.d.	1	2	3	4	5	6
1. Firm age ^b	2.98	0.70						
2. Total assets ^b	17.49	1.27	0.43					
3. New VC round ^c	0.11	0.32	-0.23	-0.00				
4. Board of directors ^c	0.99	0.08	-0.11	-0.25	0.03			
5. Time since investment	2.74	2.46	-0.04	-0.09	-0.03	-0.08		
6. Founder-CEO ^c	0.40	0.49	-0.32	-0.38	-0.03	0.07	-0.19	
7. Forecast bias	0.03	0.08	-0.07	-0.35	-0.11	0.05	0.06	0.10

^a Number of observations = 148. Correlations as of 0.19 (in absolute values) are significant at $p < .05$. Year and industry dummies are not reported.

^b Logarithm.

^c Dummy variable.

Appendix 2: description of vignettes

Experiment 1 – High Organizational Identification condition.

You are the CEO of an entrepreneurial venture, which you have founded yourself. You've put years of work into making your business idea come true and this start-up really is your baby. Leading this venture and seeing how it makes its mark gives you intense joy. You see your company as an extended family and an employee struggling with personal problems can keep you up at night.

A major investment firm has made an initial investment in your venture. Each year you communicate revenue forecasts to the investors to inform them about the prospects of the firm. The investors and their network are a great help to support the venture's growth. In the near future, you also count on the investor to make substantial additional financial investments in your venture to ensure future growth. Thus, it is important that they have a favourable impression of the financial prospects of the firm.

Experiment 1 – Low Organizational Identification condition.

You are the CEO of an entrepreneurial venture, to which you have been appointed by the board. An external search firm recruited you for this role on the basis of years of technical and managerial experience in different companies. Leading this venture and seeing how it makes its mark is not only an interesting step in your career but also a financially rewarding role. You've always been good at detaching from work and an employee struggling with personal problems does not keep you up at night.

A major investment firm has made an initial investment in your venture. Each year you communicate revenue forecasts to the investors to inform them about the prospects of the firm. The investors and their network are a great help to support the venture's growth. In the near future, you also count on the investor to make substantial additional financial investments in your venture to ensure future growth. Thus, it is important that they have a favourable impression of the financial prospects of the firm.

Experiment 2 – High Tactical Considerations condition.

You are the CEO of an entrepreneurial venture. A major investment firm has made an initial investment in your venture. Each year you communicate revenue forecasts to the investors to inform them about the prospects of the firm. The investors and their network are a great help to support the venture's growth. In the near future, you also count on the investor to make substantial additional financial investments in your venture to ensure future growth. Thus, it is important that they have a favourable impression of the financial prospects of the firm.

Given the current growth of your company, revenues for next year could be anywhere in between 750,000 and 900,000. Your best estimate for next year's revenues is 800,000\$. While developing the report to present your forecasted revenues to the investors, you consider the implications. You hope that the investors find you trustworthy and credible when thinking about the future of your investment relationship. Your future as a CEO of the venture might depend on whether these investors find you competent and have confidence in your forecasts. You don't want to appear extremely ambitious through your forecasts. And in any case, the investors would quickly notice if your forecast was inaccurate.

Experiment 2 – Low Tactical Considerations condition.

You are the CEO of an entrepreneurial venture. A major investment firm has made an initial investment in your venture. Each year you communicate revenue forecasts to the investors to inform them about the prospects of the firm. The investors and their network are a great help to support the venture's growth. In the near future, you also count on the investor to make substantial additional financial investments in your venture to ensure future growth. Thus, it is important that they have a favourable impression of the financial prospects of the firm.

Given the current growth of your company, revenues for next year could be anywhere in between 750,000 and 900,000. Your best estimate for next year's revenues is 800,000\$. While developing the report to present your forecasted revenues to the investors, you consider the implications. You are not particularly concerned that the investors find you trustworthy and credible when thinking about the future of your investment relationship. Your future career as a CEO will not depend on whether these investors find you competent or have confidence in your forecasts. You want to appear extremely ambitious through your forecasts. And in any case, the investors would not be able to tell if your forecast was inaccurate.

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