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Skirting the Issues: Experimental Evidence of Gender Bias in IPO Prospectus Evaluations

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Given the increasing number of women executives in the top management teams of initial public offering (IPO) firms, the lack of female-led IPO firms is a curious fact, especially since women-owned private businesses represent almost half of the new businesses formed in the United States, with patterns of founding similar to those of male-owned businesses. This lack of female-led IPOs suggests a potentially larger problem—a gender-based capital gap for new ventures. Given the empirical evidence suggesting a positive association between the presence of female executives and firm performance, the authors test whether investor perceptions are aligned with these empirical patterns. Using a sample of MBA students, the authors construct a simulated IPO, manipulating the gender demographics of the top management team. Their results suggest that female CEOs may be disproportionately disadvantaged in their ability to attract growth capital, when all other factors are controlled. Despite identical personal qualifications and firm financials, female founders/CEOs were perceived as less capable than their male counterparts, and IPOs led by female founders/CEOs were considered less attractive investments.

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I can calculate the motions of heavenly bodies, but not the madness of people.

—Sir Isaac Newton

Entrepreneurs are critical to the vitality of an economy. For example, from 1997 to 2005, more than 700,000 small businesses were started in the United States, generating almost 11 million jobs per year (Stangler & Kedrosky, 2010). Between 1994 and 1995, 528,000, 285,000 and 161,000 new enterprises were created in Germany, France, and the United Kingdom, respectively (Bednarzik, 2000). Given the impact of entrepreneurial activity around the world, the question of how entrepreneurs finance their ventures is a crucial question, as adequate capitalization for a new venture can make the difference between firm survival and failure. Whether spin-offs or start-ups, firms that seek to grow beyond initial size at founding rely on the decisions of potential investors for the necessary financial resources.

While the initial public offering (IPO) is one of the most common mechanisms for acquiring needed financial resources, it is surprising that women-*led* IPOs are an extremely rare phenomenon (Welbourne, 1999). The dearth of women-led IPOs cannot be attributed to a lack of women-led firms. For example, in the United States, women-owned or women-led firms represent nearly 50% of all privately held businesses and are founded in the same business sectors and in the same ratios as those founded by men (Cohoon, Wadhwa, & Mitchell, 2010). While women have increased their presence in IPO firms at the officer level, from less than 10% in 1997 to more than 55% in 2007 (Padnos, 2010), the relative absence of female-led IPOs remains a curiosity. One possible explanation for this phenomenon hints at a potentially larger problem: a gender-based capital gap for new ventures. If companies led by women are disadvantaged in their ability to raise cash through public markets, the viability and financial health of these companies, as well as their ability to expand and compete in an increasingly global and competitive environment, is threatened. Surprisingly, after repeated calls for scholarly inquiry into the role that gender might play in the financing of new ventures (Bruin, Brush, & Welter, 2006; Greene, Brush, Hart, & Saparito, 2001), a paucity of studies exists on the topic.

This study provides a fresh look at the going-public process in entrepreneurial finance, proffering a potential explanation for the paucity of women-led IPOs. The context of our study is an analysis of the investment prospectus and the role that systematic bias plays in shaping perceptions of the CEO, the top management team (TMT), and the attractiveness of the IPO. IPOs provide an intriguing investment context because of the role that institutional investors play in the valuation process antecedent to the issue, at the initial stages of the going-public process. The influence of systematic bias in investment prospectus evaluations is of tremendous importance to both the IPO and the entrepreneurship literature. Evidence of systematic bias in IPO prospectus evaluations would help to explain the paucity of women-led IPOs and also would contribute to important questions in the IPO literature (e.g., underpricing and performance) by exploring the processes antecedent to the issue (Certo, Holcomb, & Holmes, 2009).

We draw on insights from the organization, psychology, and finance literatures to develop a model for understanding how systematic bias in investment prospectus evaluations might

influence perceptions of the CEO, the TMT, and the overall attractiveness of the investment. Taking our cues from work in behavioral finance (Smith, 1989; Weber & Camerer, 1998) and organizational theory (Tosi, Brownlee, Silva, & Katz, 2003), we test our hypotheses using a lab experiment to examine aspects of individual investment decision making. Employing an experiment allows us to hold all other aspects of the investment prospectus constant while manipulating the gender composition of the TMT.

In contrast to related work that examines the influence of TMT demography on IPO outcomes, our results reveal no evidence that the gender composition of the founding team influences investor perceptions of the TMT, the potential of the firm, or the attractiveness of the investment. However, we did find one significant and persistent effect on investor perceptions that did influence those evaluations—the gender of the CEO. Our results suggest that female CEOs may be disproportionately disadvantaged in their ability to attract growth capital when all other factors are controlled. Despite identical personal qualifications and firm financials, female CEOs were perceived as less capable than their male counterparts. Moreover, IPOs led by female founders/CEOs were considered less attractive investments.

How Investor Perceptions Shape IPO Evaluations

Investors weigh a number of factors when considering whether to request shares in an IPO. Firm financials are an important consideration. A voluminous financial literature documents methods for evaluating an IPO based on financial and accounting data (Beatty & Welch, 1996; Carter & Manaster, 1990). Nevertheless, a financial snapshot of the firm is only one component of the overall attractiveness of the IPO. A growing collection of studies across the finance, accounting, and management literature explores the role of direct managerial characteristics, such as age, experience, education, reputation, and prior affiliations, on IPO valuations (Chemmanur & Paeglis, 2005; Cohen & Dean, 2005; Florin, Lubatkin, & Schulze, 2003; Lester, Certo, Dalton, Dalton, & Cannella, 2006). Examining the role that endorsements from prominent investment bankers and institutional investors play in IPO valuations, Higgins and Gulati (2003, 2006) find support that investors include TMT and CEO characteristics when considering whether or not to invest in an IPO firm.

While the finance, management, and entrepreneurship literature has documented the influence of several types of investors in the going-public process, including venture capitalists (Gompers, 1996; Lee & Wahal, 2004), underwriters (Loughran & Ritter, 2002), and the syndicate involved in the book-building process (Aggarwal, Prabhala, & Puri, 2002; Cornelli & Goldreich, 2001), one set of actors is curiously absent from the scholarly landscape: the individual investor who analyzes the firm at the front end of the going-public process (Ellis, Michaely, & O'Hara, 1999). These analysts screen investments at the earliest stages of the going-public process and bring attractive opportunities to the attention of others. Their perceptions thus shape the valuation process and hence the investor's willingness to disclose private information to the lead underwriter during the road show (e.g., the level of interest reflected in the proposed share price and the amount of shares willing to be purchased). This information, in turn, influences crucial downstream activities such as the actual offer price, allocations, and ultimately underwriter and syndicate

composition (Lamont & Thaler, 2003; Ljungqvist, Nanda, & Singh, 2006; Loughran & Ritter, 2002; Sherman & Titman, 2002).

Once the registration statement for an IPO firm is approved by the Securities and Exchange Commission (SEC) and the initial prospectus is distributed to institutional investors around the country, the lead underwriter and TMT promote the IPO through a 3- to 4-week road show in which they conduct several presentations a day with institutional investors who express interest in the issue. Institutional analysts examine the IPO prospectus and prepare an initial evaluation of the IPO firm based on its financial state, its strategy and plan for growth, and the capability of its TMT to execute that plan. Interested institutional investors attend road show presentations and indicate their level of interest by preparing a limit order that states the number of shares they are willing to purchase and the maximum price they are willing to pay. It is important to note that regardless of the level of interest prior to the issue date, no shares in the company are sold prior to the IPO and the limit order does not obligate the investor to actually purchase shares in the IPO. Rather, that decision is made only after the final IPO price and other details are determined. Final details are decided the day before the IPO when the firm and the lead underwriter meet to determine the final offer price, the exact number of shares to be sold, and other terms of the deal.

Thus, the individuals evaluating the IPO firm sit in *front* of the pricing and book-building process yet have a substantial influence over the offer price and the overall demand for the issue. It seems to us a striking omission that the literature has not taken these actors into account in studies of the IPO process. Since the decision to participate in an IPO is essentially an investment decision, the decision-making processes operating in an IPO context are likely to be fraught with the same cognitive and behavioral biases as those in other investment contexts. The evidence of systematic bias in investment decision making across the financing life cycle of a firm (e.g., Barber & Odean, 2001; Franke, Gruber, Harhoff, & Henkel, 2006; Hirshleifer, 2001; Malmendier & Tate, 2005; Zacharakis, McMullen, & Shepherd, 2007) highlights the potential benefits of studying systematic bias during the going-public process.

Our approach is to perform a direct test of the conjecture that investor perceptions, measured at the time that the investor encounters and processes the information in an investment prospectus, have a significant impact on the investor's evaluation of the IPO. Given both the growing interest in entrepreneurship research (Ireland, Reutzel, & Webb, 2005) and the call to embed TMT research in specific organizational conditions in order to resolve conflicting results (Carpenter, 2002), we believe that there are potential benefits to studying perceptions of TMT demographics in the context of an IPO, in particular those TMT demographic characteristics that are readily and reliably available to potential investors.

To perform this direct test, however, we ideally need to identify an attribute that can be defined unambiguously, that has been demonstrated to provide strong levels of categorization, and that complements existing work. An extensive literature on teams examines the inferences that individuals make about managers based on demographic characteristics (Berger, Wagner, & Zelditch, 1985; Boyce & Herd, 2003; Eagly, Karau, & Makhijani, 1995; Hooijberg & DiTomaso, 1996; Kilian, Hukai, & McCarty, 2005; Schein, 2001), on the impact of those demographic characteristics on firm performance (e.g., Eisenhardt &

Schoonhoven, 1990; Hambrick & Mason, 1984; Michel & Hambrick, 1992; West & Schwenk, 1996), and on management processes (e.g., Kochan et al., 2003; Murray, 1989; Simons, Pelled, & Smith, 1999; Simons & Peterson, 2000; Tsui & O'Reilly, 1989).

In this study, we employ gender distribution of the TMT as our demographic characteristic of interest, as it provides a rich literature from which to draw. It also is readily available in both the photographs and the descriptions provided in a typical IPO pitch book and has been shown to provide the strongest basis for categorization of people, far surpassing other demographic characteristics such as age or race (Fiske, Haslam, & Fiske, 1991; Stangor, Lynch, Duan, & Glas, 1992). An additional advantage of concentrating on gender as our demographic characteristic is the difficulty in ascertaining the validity and reliability of other TMT characteristics explored in previous IPO research. For example, TMT education and experience can be subject to manipulation and have been historically difficult to verify. David Edmundson, former CEO of Radio Shack, claimed two different degrees. Similarly, the resume of Kenneth Loclair, former CEO of Veritas, claimed he had an MBA from Stanford. Neither of these claims was true (Buchanan, 2006). In contrast, one of the advantages of our study is our focus on an unambiguous demographic characteristic, gender, in an experimental setting where we can more precisely examine its effect on investor perceptions. Gender demographics are readily and reliably available in the materials provided in a typical IPO pitch book and can be inferred with a high degree of accuracy.

Hypotheses

How might an individual evaluating an investment prospectus interpret the presence of TMT gender diversity? Reviews of the extensive literature on group diversity have noted extremely mixed empirical results (Milliken & Martins, 1996; Williams & O'Reilly, 1998). On the one hand, some studies demonstrate the positive effects of diversity (measured in terms of tenure, functional background, educational background, and ethnicity) on performance (Bantel & Jackson, 1989; Hambrick, Cho, & Chen, 1996). Other studies suggest that the effects are at least, in some cases, deleterious (e.g., Michel & Hambrick, 1992; Zajac, Golden, & Shortell, 1991). Despite the appeal of the team diversity–performance linkage, no consistent effect has been identified after 40 years of research (Williams & O'Reilly, 1998).

Irrespective of the mixed results in the scholarly research, our particular interest is not the empirical linkages between teams and performance, but investor perceptions of that relationship. These relationships are likely to be informed as much (if not more) by the current popular perception of diversity as they are by the research canon. The popular press has extolled the virtues of a diverse workforce, at least in part because of the intuitive appeal for the relationship and perhaps also because it is more congruent with current social values. Published books panegyrizing the virtues of diversity (e.g., Page, 2009) can be considered a very rough metric of media exposure to diversity ideas, which, based on keyword searches using "diversity" and "diversity in teams," resulted in over 16,000 hits and 2,800 hits, respectively, at the bookseller Amazon.com (accessed October 20, 2010). In the *Wall Street Journal,* Towers Perrin/Hudson reported that 29% of the companies they surveyed had specifically trained their managers to value diversity (Lynch, 1992).

Recent studies, however, have focused narrowly on the effect of diversity in executive teams. The results suggest that the potential advantages of diversity are, in this context, outweighed by its disadvantages. In a recent *MIT Sloan Management Review* feature, Manzoni, Strebel, and Barsoux note that "when it comes to corporate boards, the conventional wisdom is simple. . . . Diversity is good [because it] leads to more innovation, more outside-the-box thinking and better governance. . . . Unfortunately, few boards that pursue diversity ever see the wished-for returns. Many report no significant change in their performance" (2010: 1). In theory, diversity ought to resolve challenges identified in earlier team research, for example blunting groupthink. As noted by Amason (1996), it is quite difficult to get decision quality consensus and affective acceptance to peacefully coexist. In practice, diversity—while figuring prominently in "wish lists" for theorizing about on-the-job engagement—is not found to be a top factor when surveying individuals about what attracts them to a job, causes them to stay, or engages them in that job (Towers Perrin, 2006).

While the literature exploring the relationship between diversity and performance is extensive and recent results directly exploring TMT diversity and performance are tantalizing, studies examining the link between the *gender* diversity of TMTs and firm or IPO performance are extremely rare. Two studies, by Welbourne and Andrews (1996) and Welbourne (1999), suggest that the presence of females on the TMT is associated with higher earnings per share and share price appreciation. While the results from these studies are intriguing, they focus on outcomes, not the evaluation processes that precede these outcomes. While Welbourne and Andrews (1996) and Welbourne (1999) were unable to identify the causal mechanism connecting the presence of females on TMTs to positive IPO outcomes, this conjecture is not entirely without merit. The organization literature provides a plausible rationale for their findings. From the perspective of this literature, gender diversity can improve team processes more generally (Kochan et al., 2003), generate more cooperative norms (Chatman & Flynn, 2001), and result in enhanced decision making and presumably better firm performance. Related work examining the impact of within-group heterogeneity on performance (Simons et al., 1999; Simons & Peterson, 2000) provides additional support for this perspective. Given that males are socialized quite differently than females (Foels & Pappas, 2004; Murray, 1989), within-group heterogeneity might engender constructive debate by drawing on different experiences and perspectives. Findings from the 1988 British Workplace Employment Relationship Survey (Melero, 2004) provide evidence that changes in managerial style and policies are often associated with TMT gender composition.

In contrast to studies highlighting the potential benefits of gender-diverse teams, a growing collection of empirical work suggests that the differences in attitudes that individuals hold about males and females may negatively influence perceptions of performance, leading to differences in within-group and external evaluations of teams, as well as of individuals on those teams. For example, in the context of work teams, both male and female group members often hold lower performance expectations for women than for men (Lockheed & Hall, 1976; Meeker & Weitzel-O'Neil, 1977). Further, the performance of the same task often results in lower ability assessments for women than for men (Biernat & Kobrynowicz, 1997; Foschi, 2000). Wegge, Roth, Neubach, Schmidt, and Kanfer (2008) found that gender diversity had a negative impact on performance, both in the short term and

in a follow-up conducted a year later. In addition, they examined the effect for small and large groups and found that this effect was greater within small groups.

Narrowing our focus to the evaluation of TMTs specifically, empirical findings suggest that female leaders consistently receive lower performance evaluations than do male leaders, even after controlling for leadership style. Additionally, these findings indicate that women are perceived as more competent than men only when there is explicit evidence of a woman's clear and significant superiority (Shackelford, Wood, & Worchel, 1996; Wagner, Ford, & Ford, 1986; Wood & Karten, 1986). In a study comparing the ability of teams to utilize the expertise of men and women, Thomas-Hunt and Phillips (2003) found that women are perceived as less expert than men even when they possess comparable levels of expertise, that they are less influential when they possess expertise, and that groups led by expert men outperform groups led by expert women. Scholars draw on two theoretical explanations—preconceived performance expectations (Berger, Hamit, Norman, & Zelditch, 1977) and expectations of conformity to gender-based social roles (Eagly, 1987)—as rationale for these differing perceptions of competence by gender. When expertise is difficult to ascertain until an outcome reveals proficiency, a situation consistent with many top-level managerial decision tasks, biased estimates of expertise are likely to influence perceptions of other team members.

While TMT demographic characteristics such as age, experience, tenure, and education have been found to influence IPO valuations (Chemmanur & Paeglis, 2005; Cohen & Dean, 2005; Lester et al., 2006), the question of interest in this study is whether one of these demographic characteristics, gender, influences upstream evaluations of these firms during the going-public process. Given that we know gender-based perceptions are present in evaluations and expectations of behaviors within teams, and many of these perceptions are less favorable for women, we predict the following:

Hypothesis 1a: TMTs that are male dominated are evaluated more favorably than balanced or female-dominated TMTs.

Hypothesis 1b: IPOs that are led by male-dominated TMTs are evaluated more favorably than IPOs that are led by balanced or female-dominated TMTs.

Hypothesis 1c: The relationship between male-dominated TMTs and IPO evaluations will be mediated by TMT evaluations.

Another important indicator of a firm's potential success is, of course, the skills and abilities of its CEO. To help us understand the impact of gender on investor perceptions of CEO capability, we draw on two theoretical perspectives: expectation states theory (Berger et al., 1977; Berger et al., 1985; Foschi, 1989) and research on gender stereotypes (Eagly, 1987; Eagly et al., 1995; Eagly, Makhijani, & Klonsky, 1992; Leyens, Yzerbyt, & Schadron, 1992; Lippmann, 1922).

Expectation states theory suggests that characteristics such as gender or ethnicity differentiate individuals into classes or categories. In turn, these classes or categories activate differential expectations in making competence judgments (Foschi, 1989). In the going-public process, this suggests that a CEO's picture or name included in an investment prospectus could convey information about gender, which in turn could trigger different

evaluations of competence or qualifications (Berger et al., 1977; Berger et al., 1985). Previous research has found that names do, in fact, convey information about ethnicity and gender that subsequently impacts judgments. For example, Orpen (1982) found managers' evaluations of employees with stereotypically African American names were significantly less positive than those of employees with stereotypically European names, despite equivalent work records. Bertrand and Mullainathan (2004) found that job applicant resumes with stereotypically African American names (e.g., Lakisha, Jamal) were 50% less likely to receive callbacks as job applicants than those with stereotypically European American names (e.g., Emily, Brendan). A complementary body of work suggests that stereotypically feminine or masculine names also impact judgments of quality. For example, Paludi and Strayer (1985) found that articles by authors with stereotypically masculine names were evaluated more positively than those with female-named authors. Taken together, these literatures suggest that stereotypical names will effectively communicate information about one's gender and, further, that gender becomes a proxy for information that may not be readily available (Pfeffer, 1983). In a business context, the characteristic "male" frequently serves as a proxy for competence and leadership, such that males will be more favorably evaluated than females (Berger et al., 1985; Foschi, 1989).

The literature on gender stereotypes provides a second theoretical perspective informing our conjecture as to how gender might impact CEO assessment, in particular the assessment of a CEO's leadership capability. Investors making judgments about the attractiveness of an investment and the competence of the CEO are likely to bring "theories about inferences, about judgments, that colour the match between the data and the theories about these data" (Leyens et al., 1992: 113). For our purposes, we are interested in the information pertaining to the CEO and how it matches what is expected of females and males. In the case of the CEO, gender stereotypes may be used to fill in missing information, creating expectations concerning the CEO's capability to lead the TMT. Stereotypes are "shared beliefs about . . . behaviors, of a group of people" (Leyens et al., 1992: 92). When reviewing information contained in a prospectus, causal explanations generated by the investor are not simply the product of neutral information processing, but rather are closely linked to the cognitive affective system (Feather, 1985). Therefore, investors may fill in missing information from schemas or stereotypes consistent with the characteristics of the applicant (Fiske, 1993). The stereotype literature has consistently demonstrated that females are seen as having weaker leadership skills than their male counterparts. For example, males are generally seen as more competent and action oriented than females, while females are seen as more expressive and communal than males (Diekman & Eagly, 2000; Williams & Best, 1982). The close association between expectations of leaders and gender has been confirmed in a number of studies (Brenner, Tomkiewicz, & Schein, 1989; Heilman, Block, Martell, & Simon, 1989; Powell, Butterfield, & Parent, 2002; Willemsen, 2002). Boyce and Herd (2003) note that this disparity in leadership perception is especially present in male perceivers.

The role congruity perspective of Eagly and Karau (2002) amplifies these findings, arguing that prejudice toward female leaders is in part due to less favorable evaluations of their capability to lead. These lower evaluations stem from the activation of descriptive information arising from feminine stereotypes, which are dissimilar from the qualities expected or desired in leaders (Eagly & Karau, 2002). Finally, in a study exploring the

impact of gender stereotypes that moved beyond leadership in the general sense, focusing specifically on CEOs, Dennis and Kunkel (2004) found that males and masculine traits were more strongly associated with the leadership attributes necessary for CEOs in the eyes of perceivers.

Operationally, we would expect that these more favorable assessments would surface as more favorable evaluations of the CEO, resulting in more favorable evaluations of the IPO:

Hypothesis 2a: Male founders/CEOs will be evaluated more favorably than female founders/CEOs.
Hypothesis 2b: IPOs led by male founders/CEOs will be evaluated more favorably than IPOs led by female founders/CEOs.
Hypothesis 2c: The relationship between male founder/CEO and IPO evaluations will be mediated by CEO evaluations.

Method

Sample and Procedure

Our research design enables us to explore the underlying causal mechanisms of the IPO process. Of interest to us in this study are the antecedent decisions that sit at the front end of the going-public process (the road show and book-building process) rather than the event marking the end of the process (the IPO issue). The information presented to investors during the book-building process is subject to SEC regulatory scrutiny and is limited to data on a core set of managerial and financial issues. This information is summarized in a document called a prospectus. For this experiment, we constructed a packet of information designed to emulate a real prospectus in order to capture measures of investor perceptions, as well as firm evaluations, and to enable us to hold all other aspects of the IPO constant while varying the gender composition of the TMT and CEO.

Our participants were 222 MBA students who completed the survey as part of a classroom exercise. Forty-five of the participants were female. All participants were randomly assigned to one of six experimental conditions in which we held the business, financial, and management team backgrounds constant and varied the gender demographic mix of the TMT and the gender of the CEO. While the role of experimental methodologies in management research remains a topic of scholarly debate (Berkowitz & Donnerstein, 1982; Locke, 1986; Mook, 1983; Schwenk, 1982) the dialogue around the appropriate use of experimental approaches in management research centers on two concerns: whether the population of interest is adequately represented by the sample, and what the experimental method gains in terms of control for the very real risk of missing important contextual variables (Brinberg & McGrath, 1985).

We answer the first concern by noting that our experiment is focused on systematic bias. Specifically this study examines whether gender bias—previously demonstrated to be present in the general population through two mechanisms, expectation states (Berger et al., 1977; Berger et al., 1985; Foschi, 1989) or stereotypes (Eagly, 1987; Eagly et al., 1995; Eagly et al., 1992; Leyens et al., 1992; Lippmann, 1922)—influences investment prospectus evaluations. We expect that individuals processing the information in an investment prospectus

do not do so neutrally but are in fact influenced by the cognitive affective system (Feather, 1995). Subsequently evaluations of the CEO and TMT are conducted with schemas or stereotypes consistent with those of their ilk.

MBA students represent an adequate sample of both the general population and managers. That being said, we recognize that a level of expertise beyond that commonly found in the general population is required to meaningfully evaluate an investment prospectus. While the skill required is not particularly high—the initial analysis of IPO firms is a task of junior staff members in an institutional investment firm (often recent MBA graduates)—we needed to make sure that our participants had the requisite skills to successfully complete the required analysis. The focus of this study is not the relative quality of the analysis but evidence of systematic bias in that analysis. One might expect that seasoned investors (or even relatively experienced student participants with the right incentives) would make rational and profit-maximizing decisions. To that end, we limited our study to second-semester, second-year MBA students who had taken a capstone financial analysis course prior to participating in the experiment. Of our participants, 25% had previously worked in the financial investment industry. To ensure that our participants engaged in the material, we offered cash awards for the top-10 analyses. Our participants were told that a financial expert would evaluate their submissions and our awards would be based on the expert's recommendation.

We addressed the second concern by taking our cues from other studies investigating investment decision making. Research investigating investment decision making frequently relies on experimental design to address potential confounds. Specifically, experimental methodologies have been used to examine bubbles in asset markets (Ackert, Church, & Narayanan, 2001; Haruvy & Noussair, 2006; Lei, Noussair, & Plott, 2001), real options and escalation of commitment in capital investing (Denison, 2009), information acquisition and evaluation in financial decisions (Ackert, Mazzotta, & Li, 2010), dispositional effects in securities trading (Weber & Camerer, 1998), and gender differences in investment decision making (Schubert, Brown, Gysler, & Brachinger, 1999). Further, experimental methodologies have long been used to investigate the presence of systematic bias at the front end of the entrepreneurial financing life cycle, including venture capitalist decision making (Brundin, Patzelt, & Shepherd, 2008; Franke, Gruber, Harhoff, & Henkel, 2006, 2008; Mitchell & Shepherd, 2010; Muzyka, Birley, & Leleux, 1996; Riquelme & Rickards, 1992; Shepherd, 1999; Shepherd & Zacharakis, 1999; Shepherd, Zacharakis, & Baron, 2003; Zacharakis et al., 2007). While the concern about missing important contextual variables is a real one, and our ideal experimental population would, in fact, be the investment analysts themselves, our conclusion is that the control gained by the fine-grained manipulations of TMT characteristics justifies our approach.

Our experimental material was based on an actual, successful IPO, underwritten by a leading investment bank, although financial data was adjusted to conceal the identity of the company. The task developed was one where participants read a packet of information on "The Executive Face," a fictitious firm providing reconstructive and cosmetic surgery and cosmetic services, "focusing primarily on time-pressed executives requiring complete cosmetic solutions in the minimum amount of time." The Executive Face was described to participants as preparing to launch an IPO of 7,275,000 shares of common stock. Materials distributed to participants included a brief introduction followed by descriptive information

on the TMT, firm financials, industry data, and *Fortune* and *Wall Street Journal* articles highlighting news stories relevant to the industry (e.g. "Job Seekers Turn to Plastic Surgery to Stay Competitive," "Plastic Surgery Wooing Patients Hoping to Move up Career Ladder," and the like).

After reading the information provided, participants were asked to make a series of assessments related to the potential attractiveness of the investment. All financial and industry information was identical across the experimental conditions. The only information that varied was the gender distribution of the TMT members. Gender of TMT members was indicated by the inclusion of an executive photo (common in IPO pitch books) and gendered names (e.g., Matthew vs. Martha Evans). Thus, our two factors of interest—the gender of the CEO (CEO-Gender) and the gender distribution of TMT (TMT-Mix)—were manipulated in the information provided on the TMT. It should be noted that using photographs could activate additional biases related to the physical characteristics of our male and female TMT members (e.g., Langlois, Kalakanis, Rubenstein, Larson, Hallam, & Smoot, 2000; Nicklin & Roch, 2008; van Leeuwen & Macrae, 2004). To mitigate this potential bias, we pretested the models we used for each TMT member and asked participants to rate the physical attractiveness of each model; we then included models of comparable levels of attractiveness.[1] We were also concerned that ethnicity could very well be an additional source of bias. As such, we limited our choice of managers to Caucasians. We do believe differences in ethnicity warrant further study, but we could not include this factor in the current project.

In structuring the gender composition of our experimental TMT we emulated the approach of Kanter (1977) whose work characterizes the range of team composition as follows: Homogeneous teams are 100% male or female, skewed teams have a roughly 85%–15% split, tilted teams have a 65%–35% split, and balanced teams have equal numbers of men and women. Our TMT materials described six TMT roles: CEO, CFO, VP marketing, VP R&D, VP regulatory affairs, and VP operations, with gender distributions of either one (skewed), two (tilted), or three females on each team, resulting in a 2 (female vs. male CEO) × 3 (TMT that was skewed male, skewed female, or gender balanced) factorial design. The effectiveness of these manipulations was pretested on an independent sample in which 100% correctly identified the gender of the CEO. For TMT demographics, 88% correctly identified the demographic distribution of the TMT. From these results, we inferred that our manipulations were successful.

Measurement of Key Outcome Variables

We are interested in three key outcomes in the IPO process: investor assessments of the TMT, the CEO, and the overall attractiveness of the investment.

TMT assessment. TMT assessment included the prospects for the TMT remaining together over the next five years (TMT Stay), the perceived responsiveness of the TMT to changing market conditions (TMT Responsive), the likelihood that the TMT would stand up to the board of directors in the event of a disagreement (TMT StandUp), the perceived cohesiveness among TMT members (TMT Cohesive), and the potential for internal conflict within the TMT (TMT Conflict). Each of these variables was measured on 7-point Likert-type

scales with anchors of *significantly below* or *above average*. Thus, higher numbers indicate higher levels of the focal construct (e.g., higher cohesiveness, higher potential conflict, greater likelihood of standing up to the board of directors, etc.).

CEO assessment. CEO assessment included seven items designed to capture key skills and characteristics of CEOs. Due to the limited amount of information provided in this exercise, we did not believe it would be appropriate to utilize a survey instrument such as the Multifactor Leadership Questionnaire (Avolio, Bass, & Jung, 1999), which assesses leadership styles (e.g., transformational leadership, transactional leadership, or laissez-faire leadership styles). Instead, we asked our respondents questions about factors associated with CEO success or competency that would be relevant to the leadership skills that practitioners would expect (Lorsch et al., 1999; Steiner, 1982). These included the CEO's perceived experience (CEO Experience), leadership ability (CEO Leadership), how positively or negatively the CEO was likely to be seen by the public (CEO Public), the ability of the CEO to break a deadlock on the board of directors (CEO Deadlock), the CEO's decisiveness in the face of unpopular decisions (CEO Decisive), the CEO's ability to resolve TMT disputes (CEO Dispute), and the CEO's effectiveness in handling a crisis (CEO Crisis). All CEO assessment variables were measured on 7-point Likert-type scales, with higher numbers indicating more positive assessments.

IPO assessment. From an industry-level perspective, the strategic and financial evaluations of the entrepreneurial firm are critical components comprising the overall attractiveness of the investment. Ceteris paribus, firms that exist in segments of the market that offer higher potential profits will outperform firms located in segments of the market that are less profitable (e.g., Porter, 1980; Rumelt, 1991; Schmalensee, 1985). We asked respondents to assess the strategic attractiveness of the offer based on the firm's position within the industry and the resources of the firm. Our strategic evaluations included questions regarding the attractiveness of the firm in terms of its strategic positioning (IPO Strategic Position) and the uniqueness of the product (IPO Uniqueness). Our financial evaluations included the percentage of available monies the participant would recommend investing in the IPO (IPO Invest%) and, assuming an initial offering price at $12 per share, the anticipated share price in three years (IPO Price). Strategic positioning and product uniqueness were measured on 7-point Likert-type scales, with higher numbers indicating more positive assessments. Recommended investment was measured as the percentage of available monies allocated. For stock price, participants selected one of seven price categories ($0-$6, $6.1-$9, $9.1-$12, $12.1-$15, $15.1-$18, $18.1-$24, $24+).

Tables 1 and 2 detail results for pairwise correlations for the variables of interest in our study. Table 1 provides a correlation matrix for those who rated male CEOs, and Table 2 provides a correlation matrix for those who rated female CEOs.

Results

We tested our hypotheses concerning IPO assessments/attractiveness, TMT assessments, and CEO assessments in a series of MANOVAs, crossing two levels of CEO gender with three levels of TMT gender distribution (skewed male, skewed female, or balanced). Means

Table 1
Descriptive Statistics and Pearson Correlations for Male CEOs

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. IPO Strategic Position	3.91	1.19															
2. IPO Uniqueness	3.57	1.31	.62**														
3. IPO Invest%	61.28	23.17	.24*	.28**													
4. IPO Price	5.10	1.43	.55**	.44**	.67**												
5. TMT Stay	3.39	1.12	.30**	.34**	.20*	.29**											
6. TMT Responsive	4.17	0.88	.36**	.34**	.15	.19**	.31**										
7. TMT StandUp	4.20	1.10	.22*	.17	.12	.24*	.39**	.30**									
8. TMT Cohesive	4.04	1.08	.27**	.22*	.05	.16	.39**	.11	.43**								
9. TMT Conflict	3.59	1.13	–.21*	–.18	–.11	–.15	–.26**	–.07	–.25**	–.34**							
10. CEO Experience	6.40	1.22	.22*	.15	.02	.14	.21*	.18	.35**	.29**	–.21*						
11. CEO Leadership	6.35	1.11	.16	.14	.04	.11	.22*	.32**	.29**	.25**	–.08	.55**					
12. CEO Public	5.95	1.39	.21*	.22*	.15	.17	.36**	.18	.30**	.25**	–.21*	.62**	.51**				
13. CEO Deadlock	5.87	1.29	.32**	.23*	.15	.20*	.27**	.33**	.28**	.32**	–.17	.57**	.56**	.63**			
14. CEO Decisive	5.86	1.19	.29**	.13	.04	.19*	.19*	.31**	.33**	.34**	–.08	.45**	.47**	.43**	.61**		
15. CEO Dispute	5.72	1.32	.33**	.21*	.09	.26**	.38**	.24**	.32**	.38**	–.19*	.53**	.51**	.51**	.67**	.67**	
16. CEO Crisis	5.85	1.33	.31**	.21*	.06	.22*	.39**	.39**	.35**	.37**	–.19*	.57**	.68**	.58**	.69**	.57**	.76**

Note: The results are based on 111 observations. IPO = initial public offering; TMT = top management team.
*$p < .05$. **$p < .01$.

Table 2
Descriptive Statistics and Pearson Correlations for Female CEOs

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. IPO Strategic Position	3.67	1.40															
2. IPO Uniqueness	3.59	1.49	.55**														
3. IPO Invest%	16.26	18.08	.36**	.23*													
4. IPO Price	4.58	1.66	.58**	.46**	.43**												
5. TMT Stay	3.07	1.08	.32**	.28**	.34**	.24*											
6. TMT Responsive	3.96	0.93	.31**	.29**	.15	.33**	.26**										
7. TMT StandUp	3.94	1.07	.19*	.06	.11	.13	.36**	.38**									
8. TMT Cohesive	3.74	1.12	.32**	.35**	.28**	.22*	.47**	.32**	.34**								
9. TMT Conflict	3.87	1.07	–.19*	–.25**	–.15	–.18	–.17	–.01	–.07	–.19*							
10. CEO Experience	5.95	1.28	.24*	.27**	.16	.08	.11	.12	.13	.23*	–.23*						
11. CEO Leadership	5.95	1.17	.15	.26**	.23*	.07	.17	.20*	.26**	.28**	–.23*	.67**					
12. CEO Public	5.15	1.58	.17	.35**	.20*	.16	.19*	.16	.27**	.20*	–.20*	.55**	.55**				
13. CEO Deadlock	5.18	1.50	.16	.27**	.10	–.06	.33**	.13	.27**	.28**	–.23*	.54**	.60**	.52**			
14. CEO Decisive	5.68	1.42	.25**	.33**	.07	.03	.32**	.25**	.29**	.27**	–.16	.62**	.65**	.48**	.72**		
15. CEO Dispute	5.29	1.42	.26**	.37**	.12	.12	.32**	.17	.33**	.30**	–.33**	.69**	.66**	.64**	.71**	.76**	
16. CEO Crisis	5.53	1.48	.24*	.32**	.18	.07	.32**	.22*	.28**	.34**	–.28**	.65**	.72**	.60**	.74**	.82**	.81**

Note: The results are based on 111 observations. IPO = initial public offering; TMT = top management team.
*$p < .05$. **$p < .01$.

for each variable are displayed by condition in Table 3, and the ANOVA results are given in Table 4. Mediation hypotheses were tested using ANCOVAs paralleling our MANOVAs, controlling for CEO evaluations.

The overall MANOVA indicated no significant differences between male-dominated TMTs and female-dominated TMTs with respect to investor evaluations of the TMT (multivariate $F_{5, 212} = 0.46$, $p > .05$, $\eta_p^2 = .01$). Similarly, no significant difference was observed between male TMTs and balanced TMTs on investor evaluations (multivariate $F_{5, 212} = 0.84$, $p > .05$, $\eta_p^2 = .02$). Thus, Hypothesis 1a was not supported. Hypothesis 1b was also not supported, as no significant differences were observed between male-dominated and female-dominated TMTs (multivariate $F_{4, 213} = 0.56$, $p > .05$, $\eta_p^2 = .01$) and between male-dominated and balanced TMTs on investor evaluations of the IPO (multivariate $F_{4, 213} = 0.24$, $p > .05$, $\eta_p^2 = .00$). Due to the lack of support for Hypotheses 1a and 1b, a test of mediation (Hypothesis 1c) was not appropriate.

Hypothesis 2a predicted the impact of the CEO's gender on assessments of the CEO. The overall MANOVA indicated that the CEO's gender was significant (multivariate $F_{7, 210} = 3.76$, $p < .01$, $\eta_p^2 = .11$) on CEO evaluations. Significant univariate effects included Experience ($F_{1, 216} = 6.73$, $p < .01$), Leadership ($F_{1, 216} = 6.52$, $p < .05$), Public ($F_{1, 216} = 15.51$, $p < .01$), Deadlock ($F_{1, 216} = 13.29$, $p < .01$), and Dispute ($F_{1, 216} = 5.14$, $p < .05$). No significant results were observed for Decisive ($F_{1, 216} = 1.06$, $p > .05$) or Crisis ($F_{1, 216} = 2.59$, $p > .05$).

Hypothesis 2b, predicting the overall effect of CEO gender on IPO evaluations, was also significant (multivariate $F_{4, 213} = 77.71$, $p < .01$, $\eta_p^2 = .59$). The univariate effects of CEO gender were significant both for the recommended percentage to invest in the IPO ($F_{1, 216} = 255.56$, $p < .01$) and for Price ($F_{1, 216} = 6.13$, $p < .05$). No significant univariate effects were observed for Strategic Position ($F_{1, 216} = 1.98$, $p > .05$) or Uniqueness ($F_{1, 216} = 0.01$, $p > .05$). The recommended percentage to invest in the IPO was almost four times higher for firms with male CEOs at the helm than for those with female CEOs. Moreover, the anticipated share price of IPOs led by male CEOs was approximately 11% higher than those of female-led IPOs. As such, our results indicate strong support for Hypothesis 2b.

Hypothesis 2c predicts that CEO evaluations mediate the relationship between CEO gender and IPO attractiveness. Controlling for CEO evaluations in an ANCOVA, the multivariate effect of CEO gender on IPO evaluations remains significant (multivariate $F_{4, 206} = 63.37$, $p < .01$, $\eta_p^2 = .55$). Taken together, these findings indicate the relationship between CEO gender and the attractiveness of the IPO is partially mediated by the investor's evaluation of the CEO (see Figure 1).

We further probed the effect of gender on IPO attractiveness by examining the assessment of CEO by CEO gender and the gender of our respondents. We found significant interactions between respondent and CEO gender, including assessments of leadership ability ($F_{1, 210} = 7.26$, $p < .01$), public perceptions ($F_{1, 210} = 5.25$, $p < .05$), and ability to handle a crisis ($F_{1, 210} = 4.15$, $p < .05$). Although both male and female respondents evaluated CEOs of their own gender more favorably, the effect was more pronounced for male respondents. A series of paired comparisons revealed that the tendency to favor their own gender was not significant for female respondents ($p > .05$) but was significant for male respondents ($p < .05$). This finding is consistent with research that suggests that females have a more androgynous view

Table 3
Means by Condition

	TMT Gender Distribution							
	Skewed Male	*SD*	Skewed Female	*SD*	Balanced	*SD*	Collapsed	*SD*
IPO Assessments								
Strategic position								
Male CEO	3.88	1.23	3.82	1.22	4.03	1.12	3.91	1.19
Female CEO	3.59	1.34	3.56	1.44	3.84	1.42	3.67	1.40
Uniqueness								
Male CEO	3.48	1.22	3.47	1.38	3.77	1.37	3.57	1.31
Female CEO	3.70	1.54	3.36	1.33	3.71	1.59	3.59	1.49
Invest%								
Male CEO	61.88	22.26	60.82	28.16	61.00	19.21	61.28	23.17
Female CEO	14.92	17.60	14.97	16.95	18.79	19.71	16.26	18.08
Price								
Male CEO	5.12	1.21	4.88	1.81	5.29	1.27	5.10	1.43
Female CEO	4.68	1.67	4.32	1.84	4.74	1.48	4.58	1.66
TMT Assessments								
Stay								
Male CEO	3.48	1.13	3.24	1.18	3.43	1.07	3.39	1.12
Female CEO	3.30	1.10	3.06	1.07	2.87	1.07	3.07	1.09
Responsive								
Male CEO	4.07	0.97	4.24	0.96	4.23	0.69	4.17	0.88
Female CEO	4.14	0.75	3.72	0.91	4.03	1.08	3.96	0.93
StandUp								
Male CEO	4.19	1.22	4.00	1.04	4.40	1.01	4.20	1.10
Female CEO	3.95	1.18	3.86	0.90	4.00	1.14	3.94	1.07
Cohesive								
Male CEO	4.00	1.06	3.85	1.16	4.26	1.01	4.04	1.08
Female CEO	3.84	1.01	3.64	1.05	3.74	1.29	3.74	1.12
Conflict								
Male CEO	3.67	1.07	3.59	1.18	3.49	1.17	3.59	1.13
Female CEO	3.81	1.00	3.86	1.10	3.95	1.14	3.87	1.07
CEO Assessments								
Experience								
Male CEO	6.55	1.23	6.38	1.13	6.23	1.29	6.40	1.22
Female CEO	5.65	1.34	5.94	1.22	6.26	1.25	5.95	1.28
Leadership								
Male CEO	6.43	1.13	6.41	1.08	6.20	1.13	6.35	1.11
Female CEO	5.65	1.25	6.17	1.08	6.05	1.14	5.95	1.17
Public								
Male CEO	6.12	1.44	5.91	1.53	5.80	1.21	5.95	1.39
Female CEO	5.08	1.64	5.06	1.57	5.32	1.56	5.15	1.58

(continued)

Table 3 (continued)

	TMT Gender Distribution							
	Skewed Male	*SD*	Skewed Female	*SD*	Balanced	*SD*	Collapsed	*SD*
Deadlock								
Male CEO	5.90	1.50	5.91	1.26	5.80	1.05	5.87	1.29
Female CEO	5.19	1.70	5.36	1.15	5.00	1.59	5.18	1.50
Decisive								
Male CEO	5.95	1.08	5.65	1.57	5.97	0.82	5.86	1.19
Female CEO	5.62	1.57	5.64	1.13	5.76	1.55	5.68	1.42
Dispute								
Male CEO	5.86	1.41	5.56	1.54	5.71	0.96	5.72	1.32
Female CEO	5.19	1.61	5.33	1.20	5.34	1.46	5.29	1.42
Crisis								
Male CEO	6.00	1.43	5.82	1.42	5.69	1.11	5.85	1.33
Female CEO	5.24	1.59	5.64	1.44	5.71	1.41	5.53	1.48

Note: IPO = initial public offering; TMT = top management team.

Table 4
Analysis of Variance

	Multivariate ANOVAs			Univariate ANOVAs	
Source	*F*	*df*		*F*	*df*
			IPO Assessments		
CEO Gender	77.71**	4, 213	Strategic Position	1.98	1, 216
			Uniqueness	0.01	1, 216
			Invest%	255.56**	1, 216
			Price	6.13*	1, 216
TMT Gender Distribution	0.52	8, 426	Strategic Position	0.72	2, 216
			Uniqueness	0.95	2, 216
			Invest%	0.18	2, 216
			Price	1.32	2, 216
CEO Gender × TMT Gender	0.28	8, 426	Strategic Position	0.03	2, 216
			Uniqueness	0.32	2, 216
			Invest%	0.26	2, 216
			Price	0.03	2, 216
			TMT Assessments		
CEO Gender	1.81	5, 212	Stay	4.25*	1, 216
			Responsive	3.17	1, 216
			StandUp	3.17	1, 216
			Cohesive	4.07*	1, 216
			Conflict	3.85	1, 216

(continued)

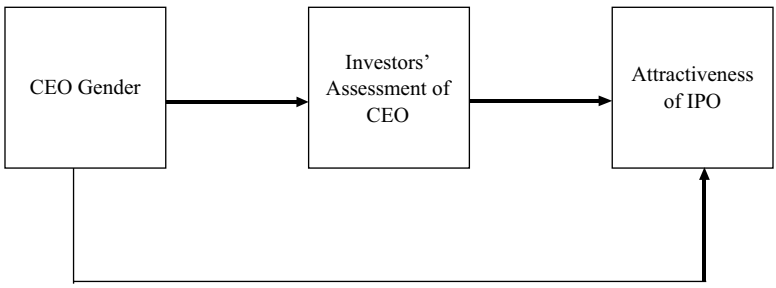
Table 4 (continued)

	Multivariate ANOVAs			Univariate ANOVAs	
Source	*F*	*df*		*F*	*df*
TMT Gender Distribution	0.71	10, 424	Stay	1.20	2, 216
			Responsive	0.55	2, 216
			StandUp	1.09	2, 216
			Cohesive	0.97	2, 216
			Conflict	0.01	2, 216
CEO Gender × TMT Gender	0.72	10, 424	Stay	0.73	2, 216
			Responsive	1.87	2, 216
			StandUp	0.26	2, 216
			Cohesive	0.57	2, 216
			Conflict	0.39	2, 216
			CEO Assessments		
CEO Gender	3.76**	7, 210	Experience	6.73**	1, 216
			Leadership	6.52*	1, 216
			Public	15.51**	1, 216
			Deadlock	13.29**	1, 216
			Decisive	1.06	1, 216
			Dispute	5.14*	1, 216
			Crisis	2.59	1, 216
TMT Gender Distribution	0.93	14, 420	Experience	0.27	2, 216
			Leadership	0.92	2, 216
			Public	0.11	2, 216
			Deadlock	0.52	2, 216
			Decisive	0.53	2, 216
			Dispute	0.08	2, 216
			Crisis	0.12	2, 216
CEO Gender × TMT Gender	1.07	14, 420	Experience	2.66	2, 216
			Leadership	1.71	2, 216
			Public	0.67	2, 216
			Deadlock	0.15	2, 216
			Decisive	0.28	2, 216
			Dispute	0.50	2, 216
			Crisis	1.57	2, 216

Note: IPO = initial public offering; TMT = top management team.
*$p < .05$. **$p < .01$.

of leadership roles, while males have a more masculine construal of leadership (Schein, 2001). Because their construal of leadership is more masculine, males would be more likely than females to view female leaders as less qualified. Further, because males have greater social power than females do, their tendency to resort to gender stereotypic information when making judgments is magnified (Goodwin, Operario, & Fiske, 1998).

Figure 1
Direct and Indirect Effects of CEO Gender on Evaluation



Discussion

Like the glass ceiling of corporate America that has limited the advancement of female managers, female entrepreneurs face a "green ceiling" when it comes to financing their entrepreneurial activities (T. Cavanaugh, 2001, as quoted by Kickul & Titus, 2005: 12). Taken as a whole, our results suggest that gender stereotypes are alive and well and, moreover, that such stereotypes impact investment decisions even though information is available to investors that clearly is counter to the prescriptive implications of stereotypical thinking (e.g., Hymowitz, 2003; Jones, 2003; Welbourne, 1999; Welbourne & Andrews, 1996). Our findings suggest that CEO gender is the only salient evaluative component of the TMT to investors. Our sample suggests that investors do not see TMT gender diversity as a predictor of potentially better performance (and, of course, once they do, the market will accommodate TMT gender diversity in pricing and the effect will disappear). Disconcertingly, participants in our study do pick up on gender as a marker (the gender of the CEO), but their stereotypes overwhelm their interpretations of the marker, potentially causing them to make poor decisions.

Our findings suggest that women are disproportionately disadvantaged in the market for entrepreneurial finance. We contribute to an ongoing debate in the entrepreneurship domain that examines why there are so few successful women-led IPOs. Our findings suggest a possible explanation by shifting the focus to an antecedent event, analyst evaluations of the firm and its IPO performance potential. We provide evidence for the observed "green ceiling" in entrepreneurial finance for women entrepreneurs and a potential explanation for this phenomenon: gender bias. While the cognitive and behavioral biases of venture capital scholars, the actors on the front end of the entrepreneurial financing life cycle, have received sustained scholarly attention (Franke et al., 2006; Petty & Gruber, 2009; Tyebjee & Bruno, 1984; Zacharakis & Meyer, 2000), to our knowledge there have been no studies investigating the role of these biases in investor evaluations during the going-public process. Our findings also shed light on an important question in the IPO literature, providing a novel perspective on IPO underpricing (Certo et al., 2009).

Our work also complements a growing collection of studies that examine how institutional investors influence share allocations during the going-public process (Lamont & Thaler,

2003; Ljungqvist et al., 2006; Loughran & Ritter, 2002; Sherman & Titman, 2002). Our findings provide a possible explanation by shifting the focus to an antecedent event, analyst evaluations of the firm. This study contributes to calls for additional theory and empirical work on the influence of individual managers on the performance of IPO firms (Certo, Holmes, & Holcomb, 2007; Higgins & Gulati, 2006; Nelson, 2003; Ritter & Welch, 2002; Welbourne & Cyr, 1999). As our findings suggest, it is not simply the performance of the CEO and TMT that is important, but investor perceptions of their potential performance also matter. These investment decisions, made by a small number of "gatekeepers" during the going-public process, influence pricing, share allocations, syndicate composition and compensation, and ultimately IPO performance.

The participants in our experiment consistently rated teams led by female CEOs as less likely to stay together during the years following the IPO and as less cohesive. Moreover, these TMT assessments influenced evaluations of IPO attractiveness. Firms led by female CEOs were considered less attractive investments than those led by male CEOs. Despite being identical in the experiment, the abilities and experiences of female CEOs were evaluated more negatively than those of male CEOs. Female CEOs were seen as less experienced, less able to lead, and less able to resolve TMT disputes and board deadlocks, as well as less favorable representatives of the companies in the eyes of the public. These poor assessments of the abilities and experiences of female CEOs also impacted the perceived attractiveness of the IPO. Thus, the direct effect of CEO gender on investment decisions was significant. In addition, the gender of the CEO indirectly impacted investment decisions through both evaluations of the CEO and assessments of the TMT.

The participants in our study seem to mirror the realities of IPO firms, where in 2009 all but 2 of the 19 high-tech IPOs had at least one female executive officer, but none were led by females (Padnos, 2010). Taken as a whole, our results suggest that gender bias still plays a prominent role in organizational processes. More specifically, gender biases impact investment decision making even though there is some research indicating that women founders/leaders can have a positive effect on performance (Hymowitz, 2003; Jones, 2003; Welbourne, 1999; Welbourne & Andrews, 1996). In our study, we did not manipulate any financial factors; we only varied the gender distribution of TMT members and the gender of the CEO. Results reveal that gender stereotypes have a significant and powerful impact on investor perceptions of the TMT, the CEO, and IPO quality and that these perceptions influence investment decision making and consequently IPO performance.

Study Limitations

Given our sample, one potential limitation is the generalizability of our findings to an actual investment context. It is possible that the participants in our study were less vigilant than actual investors in their evaluations, and participants may have been prone to making financial investment decisions on the basis of irrelevant or faulty information. We took several steps to overcome this limitation in our experimental design, as detailed in our methods section, and also recognize (and plan to explore) running this experiment with experienced analysts in future research (as detailed below). We also note that in an actual

IPO, differences between CEOs and TMT characteristics would include not only gender but also differences in experience and qualification, making it difficult if not impossible to precisely determine the basis of investor preferences for certain characteristics. In our study, the only variation across conditions was gender—the resumes were identical, with exactly the same qualifications and experiences listed. Given the relative paucity of research that has explored questions related to the impact of TMT on IPO performance and the control provided by the laboratory, we believe that our trade-off was justified. Prior to executing this experiment, we discussed its background and reviewed the materials with investors, who frequently assured us that they themselves would not make such foolhardy decisions and that the gender of the founder/CEO or the composition of the TMT would have no material influence on their investment decisions. Yet, as Odean (1998) found in his field study testing for disposition bias (Weber & Camerer, 1998) among investment professionals, the bias detected in lab studies using undergraduate participants was also manifest in investment professionals. In this study we have focused on systematic bias (present in the general population), and we have done our best to create experimental conditions that sufficiently emulate a real-world context. However, while we believe our experimental design and findings point to the presence of systematic gender bias in investment decision making, the magnitude of that effect in a professional setting remains underdetermined. While seasoned investment professionals are subject to the systematic bias present in the general population, there is competition among investment professionals that increases the cost of error. Therefore, it is possible that markets may select for less biased investment professionals, and this effect might be less pronounced in a professional setting than has been demonstrated in this experimental setting.

In our data, we were unable to find the effects we hypothesized for the gender distributions of TMT members. One possible explanation for this is that our manipulation of the TMT demographics was not sufficiently fine grained. In our sample, the 12% who incorrectly identified the demographic distribution of the TMT in the pretest of our materials (with one exception) misclassified a "skewed" TMT as "balanced." Although our TMT distributions matched Kanter's (1977) definitions of skewed, tilted, and balanced groups, the movement of a single person from one category to another redefined the classification of the group as a whole. Therefore, a single person may not have been enough. A 6-person group with 2 females may be perceived very differently than a 100-person group with 33 females, despite identical distributions. A larger team—given the same distributional characteristics—may have produced the hypothesized effect. It also may be the case that team composition is simply not considered by investors who, as "cognitive misers," simply rely on the gender of the CEO. This explanation is given credence by our (unhypothesized) finding that the only significant predictor of top management processes was not the composition of the team itself but rather the gender of the leader.

In our study, we did not manipulate any financial information in the IPO prospectus, only the gender distribution of TMT members and CEO. That gender stereotypes had such a significant impact on the amount our investors were willing to invest based on the perceived qualifications of the CEO—qualifications that were identical in every way in our experiment—is more than a little troubling. As noted, although our findings on the impact of gender on investor evaluations of the TMT, the CEO, and the investment were robust, no

financial factors were manipulated. Consequently, we cannot speak to whether gender stereotypes would dominate the more "rational" financial aspects of an investment decision. It would be telling indeed if the gender effects dominated firm financials: again, another promising avenue for future research. Although we would not expect gender stereotypes to dominate the financials in a firm with unambiguously weak financials, firms with less clear-cut prescriptive assessments from a financial perspective may still be prone to the impact of gender stereotypes in the decisions of investors.

Future Research and Conclusions

The findings from this study suggest several additional promising avenues for future research. Future studies could explore whether or not our exploratory findings are, in fact, representative of an actual sample of financial analysts by executing a direct test. We performed a pretest of these same experimental materials, using financial services professionals in a large, regional brokerage firm; we found similar patterns of results (due to the limited number of respondents, the results are not statistically significant, but they do corroborate our findings). Future research could explore whether or not these findings extend to financial professionals such as bank loan officers or venture capital investors and could investigate the role that prior experience plays in that process. This is an important question, as financial professionals, in making investment decisions for individuals and institutions, control enormous amounts of money (e.g., the combined assets of the nation's mutual funds exceed $7.4 trillion, retirement funds exceed $2.7 trillion, closed end funds exceed $20 billion, and exchange-traded funds weigh in at $174 billion; Investment Company Institute, 2004). Perhaps professional investors with less tenure in the industry exhibit more cognitive bias until they become experienced, or perhaps experience plays an institutionalizing role that makes deviance less likely. Given the findings in the IPO literature demonstrating that the characteristics of a firm's management are considered when pricing IPOs, future research could continue to explore factors related to the TMT and its CEO, moving beyond the gender effects explored in this study. Although we varied top management characteristics in this study, we did not vary the risk associated with the firm, and consequently, we do not know the relative weighting given to firm financials and management characteristics in IPO decisions.

Our findings have important implications for practice. The IPO represents an important milestone for an entrepreneurial firm. It provides critical resources for the firm's future expansion and often provides the founder and initial investor with the first substantive financial rewards from their investment of time and resources in building the entrepreneurial venture. These high-growth firms depend on access to capital and resources afforded by the IPO to realize their ambitions. Our results suggest that female founders may be disadvantaged early in this process, during the evaluation of the IPO firm by professional investors, long before the entrepreneurial firm becomes a public company. Despite identical personal qualifications and firm financials, firms led by female CEOs may be hamstrung in terms of their ability to take a company public. Female CEOs are evaluated more negatively and suffer less potential for growth capital during a liquidity event.

The disparity is significant, as is its potential economic and social impact. Perhaps it is not surprising that female entrepreneurs are more likely than male entrepreneurs to use informal forms of financing, such as credit cards. Female entrepreneurs are less likely to receive commercial bank loans (National Foundation for Women Business Owners, 2001) and, as suggested by our results, are less likely to attract IPO investors. Financing a business enterprise on a credit card will further disadvantage the female entrepreneur. As noted by Terry Cavenaugh, director of the Women Entrepreneurs' Connection at FleetBoston Financial, "This reliance on personal debt is holding women business owners back" (NFWBO, 2001). And this disadvantage extends not only to women business owners. Given the fact that women-owned businesses represent almost half of the entrepreneurial activity in the United States, anything that impacts the economics of these companies is of concern. The economic impact of women-owned firms is significant, representing over $2.8 trillion annually and employing approximately 23 million people. (Center for Women's Business Research, 2009). The potential economic impact of the "green ceiling" is substantial. If companies led by females are disadvantaged in their ability to raise cash through the stock market, this can impact the viability and financial health of their companies, their ability to expand and compete in an increasingly global and competitive environment, and—if they are unable to remain viable—their employees' livelihoods.

Note

1. We did our best to control for other visual cues and/or distortions. Thus, we used professional models with limited print exposure. The models were photographed against the same background, using a professional photographer. We used head shots to further offset unwanted wardrobe cues and conducted pretests on the relative attractiveness of our models.

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