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The Status of Women in Corporate Governance in High-Growth, High-Potential Firms

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Surveys of the largest U.S. corporations routinely demonstrate that the role of women in corporate governance is acutely limited. In this research we examine how high-growth entrepreneurial sectors of the economy compare to that standard. We posit that high demand labor markets, enhanced higher education of women, and dynamic industry and firm conditions could result in a greater participation of women executives in firms moving toward major corporate status through initial public offering. However, our study results show few significant differences between women's participation in high-growth, high-potential firms versus the Fortune 500. Several of the findings directly contradict our hypotheses, with lower rates of women as board directors and a greater likelihood of the executive team being composed exclusively of men in high-growth, high-potential firms. Women are not present in the top leadership spots of Chief Executive Officer (CEO) and Board Chair in either sector, and within high-growth firms are significantly less likely to be found on the boards of venture capital backed companies. The implications of these findings for companies, for policy, and for women and men planning careers in business are discussed.

Introduction

Although some individual women have always held leadership roles in U.S. business, substantive discussion on equitable access to leadership positions for women as a class emerged as part of a wider societal debate on civil rights in the 1960s. As a result, some activism and infrastructure within government, corporate and nonprofit organizations arose to document and endorse the promotion of capable women to executive and board roles. The most recent data available shows that advances on this agenda have been slow: women represented just 16% of corporate executive officers among all Fortune 500 companies in 2006 compared to 9% in 1995 (Catalyst, 2006a). Although this represents an absolute increase from prior decades, women executives of Fortune 500 companies in 2005 still held less than 10% of clout titles (those higher than vice president), fewer than 1% of Chief Executive Office and Board Chair positions, and only 6% of the top earner positions (Catalyst, 2006a).

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On Fortune 500 boards of directors the percentage of seats held by women was 15% in 2005, up from 12% in 1995; one in nine Fortune 500 companies had no women on its board (Catalyst, 2006b). Furthermore, women were significantly underrepresented as board chairs and chairs of the most powerful committees including audit and compensation (Catalyst, 2006b).

In comparison, women's gains in the business start-up sector of the U.S. economy have been strong. Over the past two decades, the U.S. Census Survey of Women-Owned Business Enterprises (SWOBE) has documented a dramatic growth in women-owned businesses both in number and economic power. From 1982 to 1999 the number of women-owned businesses grew by 250%, to 9 million women-owned businesses employing 28 million people and generating more than U.S.$3.6 trillion in sales (U.S. Census Bureau, 2001). Still, doubt exists on whether these gains have blossomed equitably across types of firms. Examining high-growth firms funded by venture capital, the Diana Project on women and venture capital shows that although a record-breaking U.S.$102 billion was invested in firms by the U.S. venture capital industry in 2000, women entrepreneurs received less than 5% of that total (Gatewood, Carter, Brush, Greene, & Hart, 2003). Other work has shown that women-led small- and medium-size enterprises hold their own in terms of firm performance, but only when adjustments are made for risk (Watson & Robinson, 2003).

Developmentally bridging the sectors of traditional corporate America represented by the Fortune 500 and the segment of start-up and small women-owned businesses tracked by SWOBE lies another group of firms critical to U.S. economic success: firms targeted by Wall Street as high potential for growth in value. These firms, characterized as high-growth and high-potential throughout this article, are making the critical governance transition from private to public status through the initial public offering (IPO) of stock on a public equity market. The U.S. IPO market jump-started into global significance in the 1970s by fueling high-potential, new, small and/or historically private firms into and through high-growth phases in traditional and innovative industry sectors. Indeed, more than 25% of the Fortune 500 in 2000 went public between 1980 and 1990 (Nelson, 2000).

While a limited but general expansion of women's leadership in business over the last 30 years in the United States can be documented, the role of women as founders and leaders in corporate governance in this particular segment of firms is not known, although it has been discussed anecdotally (Connolly, 2001; Lubman, 1994). This knowledge gap led to the development of our empirical research question: in dynamic, high-potential sectors of the U.S. business economy, how are women participating in governance?

This question informs a knowledge building agenda focused on understanding the conditions and benefits of entrepreneurial activity in the U.S. economy. Firms at IPO tell part of the story of founders and the growth of their ventures. Nelson (2003) established that 60% of all firms undergoing IPO in 1991 had firm founders as CEOs and many firms continue with founder CEOs or Board Chairs post-IPO. These findings are supported by Pollock and Fischer (2004). More broadly, firms at IPO are a bridge generation, in an evolutionary sense, between the start-up and the corporate behemoth. Knowing more about the initial public offering high-growth stage of potentially influential corporations informs our knowledge base about the start-up and mature, corporate stages of organizational life as well. Particularly in terms of women's leadership, this research gives us more information to answer the question: do the rates and roles of women's participation in governance change (expand/contract) as firms move along the road to become large corporations? Ultimately this question addresses the promise of entrepreneurship and its realization.

Moreover, at the individual level of analysis, this research speaks to women making decisions in terms of education and career building. As women contemplate where to apply their labor, they make choices about business start-up, high-growth, or corporate employment life. The research also serves companies, government, academia, and the interested nonprofit sector who wish to better evaluate women's relative participation in governance and the factors that may or may not influence those rates. Finally, business educators can use this information to advise their students, male and female, on issues in the workplace that may be influenced or driven by sex-based variances in upper management profiles.

We begin the article by presenting a categorization of factors that encompass the range of arguments used to explain lower participation rates of women in corporate business leadership roles in the United States. While we acknowledge that these factors are likely to be active in all economic sectors, we proceed with the objective to test an assumption that women are better represented in firms at initial public offering than in large, established businesses. A series of hypotheses on the roles, rates, and characteristics of women as founders, executive officers, and board members across economic sectors are presented. Within high-growth, high-potential firms we look specifically at two segments well examined in the entrepreneurship literature: firms funded by venture capitalists and those in industries noted for technological intensity. In the Discussion section, we explore our findings with the goal of continuing to build an understanding of women's participation as entrepreneurs and governance leaders in the United States.

Explaining Recent Patterns of Women's Participation in U.S. Corporate Governance

Longstanding research across multiple social science disciplines has examined the current and historical role of women in the U.S. corporate governance labor market. We know that women's participation in top leadership roles as executive officers and board members of large corporations is currently limited (Catalyst, 2006a, 2006b) and various explanations for this disparity between the sexes have been presented conceptually and explored empirically in the literature. In this section we present a categorization of the range of conditions credited with delivering the sex-based disparity in women's leadership we see in business today. Note should be made that the categories are not mutually exclusive; in fact, quite the opposite. For women as a class, these categories are interwoven and exist at multiple levels of analysis (individual, group, organizational, societal). They result from women's choice, from conditions imposed on women, and as the result of institutionalized conditions that result in discrimination without intentionality. Not all women face each situation in the course of their career and a review of women in business demonstrates that individual women have learned to manage across this spectrum with skill and aplomb.

Barriers to Participation, i.e., Sex Discrimination Arising from Direct Bias and/or Institutional Factors

Institutional factors help explain occupational sex discrimination as they also encompass cultural factors (Fischer, 1987) including discrimination that is unintended, but still real. Companies are slow to remove obstacles to women's careers (Oakley, 2000) such as the subtle norms that funnel women into human resources careers or create impediments

to successful work because of childcare responsibilities (Meyerson & Fletcher, 2000). Some firms simply ignore complaints about discrimination (McGeehan, 2004) or make less effort to support women who seek a balance between work and family responsibilities, because it is assumed that successful corporate women must give up family time (Ng, 2004). Firms that do have more women in top management are more likely to have lower managerial salaries, higher turnover, and emphasize promotion and development (Goodman, Fields, & Blum, 2003).

Preconceptions and stereotypes of women are seen as one of the primary reasons holding women back from top management (McShulskis, 1996). Gender schemas affect how women are evaluated by their supervisors and what attributions are made regarding their successes (Eagen, Bendick, & Miller, 2002) as well as their competence, leadership skills, and assertiveness (Van Vianen & Fischer, 2002). In one study, both sexes showed a preference for hiring male job applicants even when women had the identical background (Steinpreis, Anders, & Ritzke, 1999). Women are impacted not only by the systems above them but by lower rungs on the hierarchy. For example, men do not always want to be mentored by women, even successful women, preferring same-sex mentors due to their perception that the women are less qualified, able, and powerful (O'Neill & Blake-Beard, 2002). Gender role stereotypes lead people to see women as unfit for top executive roles (Catalyst, 2005; Tharenou, 1999) or board positions (Hefferman, 2002), and to see a disconnect between women's leadership styles and those associated with a stereotypical CEO (Oakley, 2000). Masculine characteristics are associated with successful entrepreneurs (Fagenson & Marcus, 1991). In general women are expected to act with modesty, to be selfless, and eager to soothe (Janoff-Bulman & Wade, 1996).

The performance of highly successful managers is less likely to be attributed to ability if the managers in question are women (Greenhaus & Parasuraman, 1993). Debate over women's qualifications often delays efforts to recruit them to boards (Marshall, 2001). Women who wish to be influential or effective cannot be too self-assured or too self-assertive without violating sex-based stereotypes (Janoff-Bulman & Wade, 1996), though in the hiring stage they find fairness in that interviewers are more likely to hire candidates similar to themselves in terms of assertiveness, regardless of sex (Gallois, Callan, & Palmer, 1993).

Sex-Based Differences in Competencies and Experience

Human capital is part of the explanation for women's lack of advancement (Morrison & Von Glinow, 1990). Women's skills, experience, and relative employment standing differ from men's creating gender-based career dynamics (Cohen & Broschak, 1998; Cohen, Broschak, & Haveman, 1998; Rosen, Miguel, & Pierce, 1989). Women typically have less social or human capital than is necessary to move into top positions (Tharenou, 1999), unless they have also developed political skills, a time-consuming process (Mainiero, 1994). Promotion to top management or CEO positions requires line experience in general or upper management which women often lack (Oakley, 2000; Wellington, Kropf, Brumit, & Gerkovich, 2003).

Women and men have been shown to exhibit different leadership styles (Eagly, Johannesen-Schmidt, & van Engen, 2003). In task-focused situations, men emerge more often as leaders because they focus on instrumental behaviors, whereas women are more likely to take on social leadership because they focus on communicative or expressive behaviors (Eagly & Karau, 1991). More generally, women take smaller rewards for themselves (Janoff-Bulman & Wade, 1996) and ask less of their managers than do men,

inadvertently getting shortchanged in the process (Babcock, Laschever, Gelfand, & Small, 2003). They are less likely to seek out promotion and advancement opportunities (Van Vianen & Fischer, 2002). Women are more influential with men when they speak tentatively rather than assertively, but both sexes judge tentative women as being less competent and knowledgeable (Carli, 1990), a decided catch-22.

Sex-Based Preferences in Terms of Employment Conditions

Women need to want to be in a top corporate position (Dalton & Daily, 1998), but fewer have that ambition than do men—perhaps due to the competitive environment (Van Vianen & Fischer, 2002) or simply the desire to raise a family (Belkin, 2003). They are less willing to relocate for international assignments (Fischlmayr, 2002) even though these credentials are associated with higher salaries (Eagen et al., 2002). Work–home conflict is a major reason women do not aim for senior management positions (Van Vianen & Fischer, 2002).

Sex-Based Access to Valuable Social and Financial Networks and Mentoring

Exclusion from informal social or communication networks hinders women's progress up the corporate ladder (Hefferman, 2002; McShulskis, 1996; Reynes & Wolff, 1998; Wellington et al., 2003). These networks build power by providing information about advancement and promotion opportunities (Van Vianen & Fischer, 2002). Other barriers to women's advancement include receiving less training and performance feedback than their male counterparts (Oakley, 2000), a lack of role models (Reynes & Wolff, 1998), and limited mentoring relationships or a lack of mentors (Morrison & Von Glinow, 1990; Wellington et al., 2003). Occupational segregation accounts for more than 40% of the difference between the on-the-job training and support made available to women versus men (Stroh, 2002). Men more than women are given tasks that provide developmental challenges, management of multiple functions or key business units, and international responsibilities or negotiation, whereas women are more likely to be put in situations where they are required to handle difficult relationships (Ohlott, Ruderman, & Mccauley, 1994). Women's chances of getting equity funding for their start-ups, unlike men's chances, do not increase concordant with more social capital such as a diverse network or mentoring relationships (Carter, Brush, Greene, Gatewood, & Hart, 2003).

While most studies focus on women executives, there are significant implications for women occupying other governance roles as well. Regarding board of directors, we know that new board members are generally sought from among the top management ranks of other firms (60% of outside board members are management leaders of other firms per Dalton & Daily, 1998). Given that women are underrepresented in top governance occupational categories of CEO and Board Chair in the Fortune 500 (Bilimoria, 1995; Catalyst, 2006a, 2006b; Donovan, 2001; Nertrand & Hallock, 2001), a domino effect then limits the pool of candidates to the systematic exclusion of women considered for board nomination.

The Promise of Entrepreneurship

There is reason to believe that conditions may be different, and perhaps better, for women in growth sectors of the economy. Relevant economic and social factors suggest

that high-potential firms in terms of growth and financial development may relax or resist employment conditions extant in traditional corporate America (Becker & Huselid, 1998; Crane, 2004; Fryxell, 1990; King, 2001; Lubman, 1994; Resnick-West & Von Glinow, 1990; Turbin & Rosse, 1990). For younger firms without extended performance histories, developing attractive signals of top management competency may be prioritized to win financial backing (Florin, Lubatkin, & Schulze, 2003; Zacharakis & Meyer, 2000). Levels of labor market demand, outstandingly high in the boom days of the 1990s (Gibson, 1999; Koretz, 2000; Schellhardt, 1997; Veneri, 1998), could be expected to challenge and override discriminatory hiring attitudes regarding executives (Anonymous, 1998) and promotional routines for board members. Moreover, high compensation levels resulting from demand conditions could entice more women to take part, overruling potential drawbacks of the high-growth firm work style and/or workplace conditions.

Furthermore, institutional arguments suggest that younger, more dynamic firms and industries may be less rigid and more open to the untraditional (Abernathy & Utterback, 1988; Fligstein, 1991; Powell & DiMaggio, 1991). This could be translated in a workplace setting into acceptance and even promotion of diversity in gender of leadership. The drive for resources, a real life and death struggle for high-growth firms, could lead management to be more focused on competencies and performance and therefore more flexible in arranging work style rules to employee preferences (Crainer & Dearlove, 1999). In addition, research shows that women are more likely to work for younger firms (Blum, Field, & Goodman, 1994).

Ongoing and recently dramatic discussion on the governance system of public corporations in the United States has led to proposals and regulatory shifts to increase the number of independent, nonemployee board members (Dunham, 2002; Gutner, 2001; Hennessey, 2002), with associated promotion of women specifically to fill these slots (Burke, 1997; Hymowitz, 2003). In fact, a majority of Fortune 1000 firms are reported to be seeking to fill board seats with women (Witkowski, 2002) and financial experts (Plitch, 2003). As the number of women obtaining degrees in financial areas is roughly equal to that of men (U.S. Department of Education, National Center for Education Statistics, 2001b), more opportunities for women as board directors are suggested. Finally, firms undergoing regulatory and market review during initial public offering could be argued to have an even greater opportunity and the motivation to design a governance structure that responds to public concerns about independent oversight.

This optimism about the potential for an expanded role for capable women in governance in firms around IPO must be tempered by an understanding of countervailing forces that are also likely at work but on the side of depressing women's participation in governance. As high-growth, high-potential firms strive to "join the big boys," their "liability of newness" may lead them to emulate the practices and policies they see in their aspirants and their relationship networks (Stinchcombe, 1965). In seeking to access mainstream funding sources (i.e., the investment banking world) as well as institutional and private investors, company decision makers may abandon more idiosyncratic practices in favor of those believed to send specific signals (Certo, 2003).

Given the lack of financial history for young firms, investors are known to use manager characteristics to make decisions, even though those criteria may not be productive in identifying high performing companies (Baum & Silverman, 2004; Zacharakis & Meyer, 2000). Moreover, the environment of long hours, high pressure, and the unpredictability of moving a growing organization to more stable ground may disfavor women and/or create working conditions that are deemed undesirable to women and their families (U.S. Department of Labor, Glass Ceiling Commission, 1995; Van Vianen & Fischer, 2002).

In conclusion, theoretical tension exists which makes it difficult to predict women's participation in the governance of high-growth, high-potential firms relative to the Fortune 500 with a high degree of confidence. Core concepts of entrepreneurship suggest different likelihood conditions for firms around IPO: liability of newness, at its core an argument for institutionalism, stands at odds with entrepreneurialism, a promise of opportunity for new thinking and practice.

Poole and Van de Ven (1989) argue that theoretical tensions such as these are "inherent in human beings and their social organizations" and they urge researchers to fight the tendency to move toward theoretical consistency at the cost of "less and less correspondence to the multi-faceted reality it seeks to portray." Therefore, we proceed cautiously to test the conceptual ground that high-growth, high-potential firms may be better for women in governance based on the evidence of recent success of women in start-up companies, the labor market strengths of the 1990s, and women's recent increasing levels of higher education in business.

We test comparative rates of women's participation in the two economic sections via two hypotheses. In Hypothesis 1 we compare women's rates of participation in high-growth, high-potential firms to those found in Fortune 500 firms for six key governance roles. In Hypothesis 2 we compare, using a dummy variable at the firm level, whether women are present at all, by role, by economic sector. At the employee level we consider the chief executive officer, the senior executive officer, and the executive officer role to investigate rank as well as proportion of participation. The board of directors is similarly compared for the roles of chair of the board of directors, board director, and employee board director. Employee board directors are defined here as those individuals, other than the CEO, who serve as executive employees and board members concurrently.

Hypothesis 1: The rate of participation of women as: (1) chief executive officers, (2) senior executive officers, (3) executive officers, (4) chairs of the board of directors, (5) board directors, and (6) employee board directors will be higher in high-growth, high-potential firms versus firms in traditional economy sectors.

Hypothesis 2: The rate of firms with (at least) one woman in the role/s of: (1) chief executive officer, (2) senior executive officer, (3) executive officer, (4) chair of the board of directors, (5) board director, and (6) employee board director will be higher in high-growth, high-potential firms versus firms in traditional economy sectors.

A persistent argument offered to explain the poor showing of women in terms of Fortune 500 employee leadership roles concerns the availability of women with relevant and deep experience to be considered for advancement to the top slots (Bilimoria, 1995; McShulskis, 1996; Tharenou, 1999). As more women have joined the ranks of middle and upper management (Catalyst, 2006a) the pool of female candidates for governance slots has grown, perhaps making women's leadership advancement a time dependent phenomenon (Dalton & Daily, 1998). While variation in the absolute age of women across sectors could be credited to a variety of factors, the comparative age of women versus men executive officers and board directors may serve as an indicator of the potential of women for advancement moving forward. Furthermore, if women are relatively younger than their male counterparts, it may indicate that more opportunities for women's advancement have been present, i.e., women have been able to advance more quickly than men within their careers in recent years.

Hypothesis 3: Women (1) executive officers and (2) board directors will be younger, on average, than their male counterparts in high-growth, high-potential firms versus firms in traditional economy sectors.

Financing sources and networks and the level of technological intensity of the industry are firm level factors of continuing interest to the field of entrepreneurship. Prior research suggests that each may influence the relative participation of women in corporate governance. We examine each of these factors in turn.

Financing Sources and Financing Networks

Businesses grow through a variety of financing methods but private venture capital is linked specifically to high-growth, high-potential firms for the possibility of superlative gain (Timmons & Sapienza, 1992; Tyebjee & Bruno, 1984). Confidence and cooperation augment control mechanisms in management of the entrepreneur and venture capitalist relationship (Shepherd & Zacharakis, 2001). One "cash out" moment for venture capitalists is the initial public offering when early investors can sell their stock to the public.

Venture capitalists are the deal makers who bring together investors (supply) and capital seeking companies (demand) (Brush, Carter, Greene, Hart, & Gatewood, 2002; Carter et al., 2003; Gatewood et al., 2003). The network of venture capital is tight, geographically concentrated, and closed (Bygrave, 1987). In their research on venture capital equity investments and gender, Greene, Brush, Hart, and Saparito (2001) found that the firms winning venture capitalist investment at start-up through later seed private investment rounds included only about 4% with women founders or top managers in the period 1988–1998 (290 firms total), even though 600,000 U.S. women-owned firms had revenues above $1 million in 1992 (Greene et al., 2001). In the authors' words, "There is evidence that the venture capital community may be missing many good opportunities to invest in women-owned businesses" (Greene et al., 2001, p. 75). Greene and colleagues discuss how this relationship of low levels of venture capital investment and women's business leadership is likely related to factors of demand and supply including structural barriers to women, the human capital of women business owners, and the strategic choice of women owners.

With Hypothesis 4 we extend the case of Greene et al. (2001), from pre-IPO to IPO firms and from owner/CEO to a range of organizational positions to consider whether firms at IPO show a negative association of venture capital backing with the presence of women leaders.

> **Hypothesis 4:** In high-growth, high-potential firms, the rate of participation of women as: (1) chief executive officers, (2) senior executive officers, (3) executive officers, (4) chairs of the board of directors, (5) board directors, and (6) employee board directors is lower in firms that have venture capital backing than in firms that do not have venture capital backing.

Technology Intensive Industries

The Historical view is that high technology and its science and math roots are particularly male dominated arenas. While advances have been made, women in the United States still constitute less than 25% of new PhDs in math and the physical sciences and less than 17% in engineering and computer and information science (U.S. Department of Education, National Center for Education Statistics, 2001b). In addition, working conditions in high technology are known to be extraordinarily demanding and therefore less amenable to the family and work style preferences of some women (Pleshaw, 2000). Hewlett (2002) notes that although leadership opportunities exist, women's life roles continue to conflict with the demands of professional advancement.

Considering governance and the board of directors, associated industry conditions may influence women's participation rates. Social networks drive recommendations for new members and new members of a board tend to be other senior executives (Dalton & Daily, 1998). In the high-growth biotech industry, for example, board members are commonly drawn from leaders in the healthcare industry—and male executives predominate there (Lubman, 1994). Evidence shows that women executives in the traditional economy, i.e., the Fortune 500, historically cluster in nontechnology services (Catalyst, 2002) making women as a group less qualified and therefore less likely candidates for board seats in technology intensive firms.

Acknowledging these arguments we move to test for higher participation rates for women in dynamic, high tech industries for three primary reasons. First, a focus on employee competencies and performance and the demand for skilled professionals can provide a strong push for the removal of barriers to women's leadership in technology intensive sectors (Becker & Huselid, 1998; Fryxell, 1990; Lubman, 1994; Piller, 1999; Resnick-West & Von Glinow, 1990; Turbin & Rosse, 1990). Then there is anecdotal information. The journal *Research Technology Management* (Gwynne, 1998) reported that software development firms alone were short 100,000 workers in the United States in 1998. Moreover, 70% of high technology CEOs cited lack of highly-skilled workers as a major barrier to firm growth (Gwynne, 1998). Employees left other industries to work in high technology companies as a result of labor demand and its associated higher employee benefits (Crainer & Dearlove, 1999). Companies in industries like biotechnology strategically imported finance, accounting, and corporate counsel executives from other industries (Connolly, 2001). High tech leader Microsoft deliberately and widely advertised its change in culture in the mid-1990s from a "rude boys' paradise" to one that could attract top female job applicants and promote female employees in computer science (Moody, 1996).

Concurrently over the past 20 years, steadily increasing percentages of women have enhanced their business and technology career skill sets by completing college (U.S. Department of Education, National Center for Education Statistics, 2001a, 2001b), masters level business programs (U.S. Department of Education, National Center for Education Statistics, 1996, 2000), and specialized graduate degrees in math and science (Proulx, Tremblay, & Wils, 2001; Reynes & Wolff, 1998). In addition, anecdotal evidence reports that maturation in technology sectors has led women to make strides in creating professional business networks (Kress, 2002; Torres, 1999; Trewyn, 2001). These conditions on the demand and the supply side of the market for leadership in technology intensive industries suggest the potential for a higher participation rate by women in technology intensive than in traditional industries.

Hypothesis 5: In high-growth, high-potential firms, the rate of participation of women as: (1) chief executive officers, (2) senior executive officers, (3) executive officers, (4) chairs of the board of directors, (5) board directors, and (6) employee board directors will be higher in firms in technology intensive industries than in firms in other industries.

Methods

Sample

Our two populations of interest, traditional economy firms and high-growth, high-potential firms, are tested with the Fortune 500 and the group of U.S. firms undergoing

initial public offering in the United States in 1998–1999. We chose 1998–1999 because it was recent and a time of relative economic munificence; new firms were presenting themselves for IPO at a hearty clip and adequate firm representation in each of the economic sectors of interest was then available for our dataset. Opportunity abounded in funding, promotion, labor markets, and wealth creation. Moreover, there was nothing in the period to suggest that sex was a particularly relevant factor in employment or promotion decisions.

A random stratified sampling technique was used to select 100 Fortune 500 firms from the population of the 569 firms listed on the Fortune 500 in 1998 and 1999 and 100 IPO firms from the population of 713 firms completing initial public offerings in 1998 and 1999. Each group was further delineated to include 50 firms in technology intensive industry sectors and 50 firms in other industry sectors. Technology intensive industries are defined by a four-digit SIC code as those directly engaged in the design and production of technology products and services including computer hardware, computer software, semiconductors, pharmaceuticals and biotechnology, instruments and measurement devices, and semiconductors and related electronic products (SIC codes 2834, 3570-71-72, 3575-77, 3674, 3695, 3823, 2829, 4813, 7372, 8731). The comparison sectors are wholesale and retail trade and banks, industries chosen because there were an adequate number of firms undergoing IPO, the constrained category, in the target period.

Data were collected on the individuals filling various key governance roles for these sample firms. Our data source on the IPO firms was the public company mandated filings to the U.S. Securities and Exchange Commission (SEC), including the S-1, 10-K/KA, and DEF14A. Data on Fortune 500 firms came from 10-K/KA and DEF 14A SEC filings. While a company generally has only one CEO and one Board Chair, leading to one data point per firm per role (N = 100 for each of CEO and Board Chair), multiple people fill other governance roles in a firm. As a result, the total number of individuals included in the full dataset for other roles was the following: executive officer, N = 1,885; senior executive officer, N = 1,132; board directors, N = 1,894; employee board director, N = 466.

Measures

To determine women's participation in governance we consider the percentage of female CEOs, senior executive officers, executive officers, board chairs, board members, and employee board members relative to total numbers and the percent of firms, by sector, with any woman, by role. We also examine the authority hierarchy of the roles CEO, executive officer, and senior executive officer as well as board chair, employee board member, and board member. Finally we compare the ratio of female to all executive officers and of female to all board directors on the chronological age of the individuals.

We use descriptive and inferential statistics to test the hypotheses and report the findings. Because the governance variable distributions are not normally distributed given the high number of firms with no women participating, we used the Levene's test for equality of variance to determine appropriate *t*-test results.

Findings

Table 1 presents the mean percentage of women by governance role and the mean percentage of firms with one (at least) woman per governance role for four economic

Table 1

Mean Percent of Women by Role for Various Economic Sectors; Percent of Firms by Sector with One Woman (at Least) in Governance Role

	Chief executive officer			Executive officers		Senior executive officers[†]		Board chair		Board directors		Employee board directors	
	N sample firms[†]	Mean % women in role	% firms with one (at least) woman in role	Mean % women in role	% firms with one (at least) woman in role	Mean % women in role	% firms with one (at least) woman in role	Mean % women in role	% firms with one (at least) woman in role	Mean % women in role	% firms with one (at least) woman in role	Mean % women in role	% firms with one (at least) woman in role
Traditional—High-growth, high-potential sectors													
Traditional economy	100	.00	.00	.08	.59	.05	.37	.00	.00	.11	.86	.02	.04
High-growth, high-potential	100	.01	.01	.08	.42	.07	.19	.01	.01	.03	.18	.03	.06
Technology sectors													
Technology intensive	100	.01	.01	.07	.45	.05	.31	.01	.01	.07	.49	.03	.04
Other technology firms	100	.00	.00	.09	.54	.07	.38	.00	.00	.07	.55	.02	.06
Quadrants													
Traditional economy and technology intensive	50	.00	.00	.06	.50	.04	.33	.00	.00	.10	.86	.00	.00
Traditional economy and other technology firms	50	.00	.00	.09	.66	.07	.49	.00	.00	.11	.86	.04	.08
High-growth, high-potential, and technology intensive	50	.02	.02	.08	.40	.06	.29	.02	.02	.03	.12	.06	.08
High-growth, high-potential, and other technology firms	50	.00	.00	.08	.42	.07	.27	.00	.00	.04	.24	.01	.04
Financing sectors (high-growth, high-potential)													
Venture capital backed	31	.00	.00	.06	.35	.07	.19	.00	.00	.00	.03	.00	.00
Nonventure capital backed	69	.01	.01	.09	.43	.06	.21	.01	.01	.04	.25	.05	.09
Average total sample	200	.01	.01	.08	.50	.06	.28	.01	.01	.07	.52	.03	.05

[†] N = 95 for traditional economy sample firms and N = 93 for high-growth, high-potential sample firms for this category because some firms did not have the role of senior executive officer.

sector categorizations. In the sample of 200 firms (100 IPO and 100 Fortune 500) there is only one woman CEO and one woman board chair. As a result, no further statistical analyses on those roles could be done.

The most striking differences between the high-potential firms and the Fortune 500 are the higher percentages of women serving Fortune 500 firms as board directors. For technology intensive industries and in venture capital backed firms, women were less present in most roles. While every firm in the sample had at least one employee board director, women were particularly scarce in that role; mostly under 5% across categories.

In high-potential firms almost 60% of the executive teams and 80% of the boards of directors in the sample lacked even one woman member. By comparison, in the Fortune 500, 41% of the executive teams and 14% of the boards of directors lacked a woman participant (Table 1). The mean percentage of women participating never rises above 11% for any governance role in any economic sector categorization. The least likely place to find a woman is as CEO, board chair or as a member of the board of a venture capital backed company. The most likely place to find a woman is on the board of a Fortune 500 firm.

Hypothesis 1 posited a higher rate of participation for women in high-potential firms versus the Fortune 500 for four governance roles (executive officer, senior executive officer, employee board director, board director). Results were mixed on this point for the sample but only in the case of board directors was the result significant for the population, and then in the opposite direction of that hypothesized (Table 2). Women were significantly more likely to serve on the board of directors of a Fortune 500 firm than on the board of an IPO firm. Hypothesis 2 also examined women's participation rates, considering the relative percentage of firms with one (at least) woman by role. Table 3 shows significant results for three of the four roles, but again, in the opposite direction of that hypothesized: at the firm level, at least one woman was significantly more likely to be an executive officer, a senior executive officer or a board director in the Fortune 500. Hypotheses 1 and 2 are not supported.

Hypothesis 3 examines the relative ages of women and men in the governance feeder roles of executive officer and board member for the two samples. The hypothesis suggests that if women are relatively younger than their male counterparts at IPO then more recent opportunities and more future opportunities for women in that sector may exist. Table 4 reveals that while women are significantly younger in IPO firms than in Fortune 500 firms for the roles of executive officer (mean 43 years versus 46 years) and board director (48 years versus 55 years), they are younger but not significantly younger than their male counterparts within their own sector. Hypothesis 3 is not supported for the population.

Hypotheses 4 and 5 considered the IPO sample set exclusively. Hypothesis 4 posits that women are less likely to be found in governance roles in venture capital backed firms. Results (Table 5) confirm that this is significantly true for the roles of board director and employee board director. The roles of executive officer and senior executive officer do not return significant results. Hypothesis 4 is then partially supported. Hypothesis 5 looks to the degree of technology intensity of firms and its relationship to women's participation rates (Table 6). No significant results were found leading to the tentative conclusion that women's participation by governance role does not vary with the degree of technological intensity of the firm and industry.

Discussion

These findings are the first to quantify women's participation as governance leaders in high-growth, high-potential firms in the United States. The research shows that women are

Table 2

Results for Independent Samples *t*-test; Levene's Test for Homogeneity of Variance on Mean Percent Women by Role

	N sample firms[†]	Traditional economy mean	SD	High-growth, high-potential mean	SD		Levene's test for equality of variance		*t*-test for equality of means		
							F	Sig.	*t*	df	Sig.
% women executive officers	200	.08	.08	.08	.11	Equal variances assumed	14.31	.000			
						Equal variances not assumed			–0.40	181	.692
% women senior executive officers	188[†]	.05	.08	.07	.14	Equal variances assumed	10.92	.001			
						Equal variances not assumed			–0.71	145	.482
% women board directors	200	.11	.06	.03	.08	Equal variances assumed	0.33	.568	7.36	198	.000***
						Equal variances not assumed					
% women employee board directors	200	.02	.11	.03	.16	Equal variances assumed	2.89	.091			
						Equal variances not assumed			–0.86	180	.393

[†] N = 95 for traditional economy sample firms and N = 93 for high-growth, high-potential sample firms for this category because some firms did not have the role of senior executive officer.
* significant at the .1 level; ** significant at the .05 level; *** significant at the .01 level.

Table 3

Results for Independent Samples *t*-test; Levene's Test for Homogeneity of Variance on Percent of Firms with any Women, by Role

	N sample firms[†]	Traditional economy mean	SD	High-growth, high-potential mean	SD		Levene's test for equality of variance		*t*-test for equality of means		
							F	Sig.	*t*	df	Sig.
% women executive officers	200	.58	.50	.41	.49	Equal variances assumed	0.08	.776	2.43	198	.016**
						Equal variances not assumed					
% women senior executive officers	188[†]	.36	.48	.20	.41	Equal variances assumed	22.42	.000			
						Equal variances not assumed			2.36	186	.019**
% women board directors	200	.86	.35	.18	.39	Equal variances assumed	2.38	.568	13.07	196	.000***
						Equal variances not assumed					
% women employee board directors	200	.04	.20	.06	.24	Equal variances assumed	1.68	.196	–0.65	198	.519
						Equal variances not assumed					

[†] N = 95 for traditional economy sample firms and N = 93 for high-growth, high-potential sample firms for this category because some firms did not have the role of senior executive officer.
* significant at the .1 level; ** significant at the .05 level; *** significant at the .01 level.

Table 4

Results for Independent Samples *t*-test; Levene's Test for Homogeneity of Variance on Average Age Women

	N sample firms†	Traditional economy mean	SD	High-growth, high-potential mean	SD		Levene's test for equality of variance		*t*-test for equality of means		
							F	Sig.	*t*	df	Sig.
Age of women executives	101*	46.3	5.8	42.9	6.6	Equal variances assumed	1.92	.169	2.78	99	.007**
						Equal variances not assumed					
Ratio: age of women executives/all executives	101*	.92	.11	.93	.13	Equal variances assumed	5.09	.026			
						Equal variances not assumed			−0.21	75	.836
Age of women board members	104*	55.3	7.0	48.2	10.0	Equal variances assumed	1.29	.260	3.62	102	.000***
						Equal variances not assumed					
Ratio: age of women board members/all board members	104*	.95	.12	.90	.17	Equal variances assumed	0.67	.415	1.41	102	.163
						Equal variances not assumed					

† N represents firms with at least one woman in the role.
* significant at the .1 level; ** significant at the. 05 level; *** significant at the. 01 level.

Table 5

In the High-Growth, High-Potential Group, Results for Independent Samples *t*-test; Levene's Test for Homogeneity of Variance on Mean Percent Women by Role in Venture Capital (VC)-Backed versus Other Firms

							Levene's test for equality of variance		*t*-test for equality of means		
	N sample firms[†]	VC backing	SD	No VC backing	SD		*F*	Sig.	*t*	df	Sig.
% women executive officers	100	.06	.09	.09	.12	Equal variances assumed	5.40	.022			
						Equal variances not assumed			1.54	74	.129
% women senior executive officers	100	.07	.15	.06	.14	Equal variances assumed	0.27	.607	–0.15	91	.883
						Equal variances not assumed					
% women board directors	100	.00	.02	.04	.19	Equal variances assumed	24.28	.000			
						Equal variances not assumed			3.36	84	.001**
% women employee board directors	100	.00	.00	.05	.19	Equal variances assumed	9.51	.003			
						Equal variances not assumed			2.21	68	.031**

[†] N = 95 for traditional economy sample firms and N = 93 for high-growth, high-potential sample firms for this category because some firms did not have the role of senior executive officer.
* significant at the .1 level; ** significant at the .05 level; *** significant at the .01 level.

Table 6

In the High-Growth, High-Potential Group, Results for Independent Samples *t*-test; Levene's Test for Homogeneity of Variance on Mean Percent Women by Role in Technology Intensive versus Other Technology Firms

	N sample firms[†]	Technology intensive	SD	Other technology firms	SD		Levene's test for equality of variance		*t*-test for equality of means		
							F	Sig.	*t*	df	Sig.
% women executive officers	100	.08	.12	.08	.11	Equal variances assumed	.013	.911	–0.07	98	.943
						Equal variances not assumed					
% women senior executive officers	93	.06	.14	.07	.14	Equal variances assumed	.008	.927	–0.10	91	.918
						Equal variances not assumed					
% women board directors	100	.03	.09	.04	.07	Equal variances assumed	0.583	.447	–0.64	98	.522
						Equal variances not assumed					
% women employee board directors	100	.06	.21	.01	.06	Equal variances assumed	0.130	.003			
						Equal variances not assumed			1.45	56	.153

[†] N = 95 for traditional economy sample firms and N = 93 for high-growth, high-potential sample firms for this category because some firms did not have the role of senior executive officer.
* significant at the .1 level; ** significant at the .05 level; *** significant at the .01 level.

absent from governance in most IPO firms and when they are present their rates of participation in key governance roles do not differ significantly from Fortune 500 firms, or they are lower. Women were equally *invisible* in the key roles of CEO and Board Chair in high-potential firms as they were in large corporations (only one woman for each role out of the sample of 200 firms). Women are particularly comparatively absent as members of the board of directors and within high-growth firms in companies funded by venture capital. Women were not found to be less present in high technology firms versus comparative firms. Our findings also show that women in high-growth, high-potential firms achieve executive roles at a younger age than women in the Fortune 500, but men do too. The study data represents the economic boom period of 1998–1999 which should present the best-case recent scenario for women in leadership.

These findings move us to new conceptual questions. For example, given that women are founding firms at a rapidly increasing pace in the last two decades, do the results of this study suggest that women may be exiting their leadership role in high-growth firms pre-IPO? Is there a "glass ceiling" for women in entrepreneurial sectors? Or, together with the findings on women and venture capital (Brush et al., 2002), do we interpret these findings to say that while women are founding firms, or participating in the founding of firms, they are not doing so in industry sectors likely to develop IPO firms? Moreover, if high-potential firms are founded by men, are women disadvantaged in being asked to join the team based on conditions present at firm founding (Baron & Hannan, 2002; Ruef, Aldrich, & Carter, 2003)?

To move on a research agenda from here, we believe that the best next step is to talk to the women themselves—those who remain, and those who have exited. What is their perception of the potential of women in leadership in firms around IPO? Triangulating that feedback with the opinions of men (governance leaders, funding agents) and following up with a second data period would be useful.

For working women these findings inform career decisions involving where to invest labor and how to think about employment choices by economic sector. Women who want to succeed as business leaders should know that the choice to work in a start-up, high-growth, or large firm corporate setting is an important one from the perspective of career development. If women are constrained (by imposition or free will) from participating in high-potential, high-growth firms as this research suggests, they should consider investing their energies in an alternate economic sector to reach their goal. Given these findings regarding the dearth of women's leadership in firms at IPO, women interested in exercising governance authority may want to carefully consider the business start-up option. While this research shows that the most likely place to find a woman successfully climbing the corporate ladder is in a large, well-established, nontechnology intensive firm, that success rate of women is still around 10–20% across position categories.

For women and for career mentors (e.g., university faculty, career counselors, male and female supervisors) understanding what inhibits women's governance participation may require an assessment of the gap between women's skills and knowledge and the requirements of leadership under these conditions. Around IPO the interdependent intraorganizational networks of firms may be especially important and women may lack the skills, signaling profile, reputation, knowledge or some other attribute deemed important. These real and/or perceived deficiencies can potentially be addressed through self-reflection, education, mentoring, impression management, and/or other activities and training.

Colleges and universities offering MBA programs or other graduate degrees can address career development issues better and sooner. Much of a school's prestige comes from the placement and continued success of its graduates. Given that over one-fourth of

first-year students in Business Week's top-30 U.S. MBA programs are female (*Business Week Online*, 2001), business schools would best serve these students and themselves by providing descriptive and prescriptive information about career paths, networking, board memberships and interlocking directorates, and other issues in the workplace influenced or driven by sex-based variances. While some women may tailor their study and career ideas to work in an economic sector with a more favorable gender landscape, others willing to take on the challenge of a more minority position can be mentored for success.

Finally, a ground-up approach in academia can foster nascent entrepreneurs and their ability to acquire the financial support needed to bring a firm to IPO. More conservatively, colleges and universities can work in conjunction with recruiters to place women graduates in technology and nonservice related corporations in order to provide a greater entrée to career opportunities at the executive level.

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