HIGH PERFORMANCE ENTREPRENEURS: WOMEN IN HIGH-TECH

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INTRODUCTION

Investors seeking to reinvigorate bottom line performance would do well to look at the potential for advantaged returns in an often-overlooked group of companies – high-tech start-ups co-founded or led by women entrepreneurs.

Over the past 30 years, more and more women have co-founded and successfully built capital-efficient high-tech companies that deliver venture-level returns.[1] And they are doing so with less funding and fewer failures than the norm.[2] In just the last 10 years, women's involvement at officer–level in companies that IPO has grown dramatically - from 10 percent in 1997 to over 55 percent in 2007. [3] Women are now earning the necessary degrees and have gained appropriate management experience to make substantial contributions to technology development. Repeated studies find that gender diversity at the officer level improves financial results and leads to more creative problem solving. Today, women make up more than 30 percent of the high-tech workforce and yet they receive less than 10 percent of venture funding.[4]

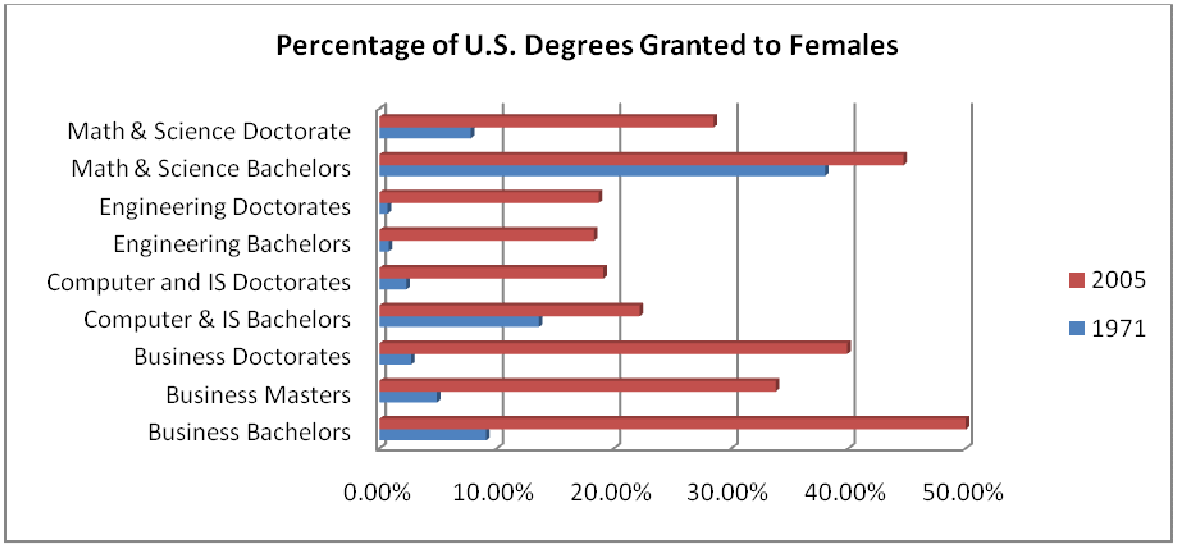
This paper illuminates the opportunity represented by the current investment gap between the large and fast growing pool of skilled women entrepreneurs in high-tech and the limited funding in this sector. We focus on the profit potential of financing companies co-founded or led by women - the invisible entrepreneurs.

WOMEN ARE VENTURE-READY

The Right Education

The growth of women's participation in high-tech is reflected in a changing educational landscape. The National Academy of Sciences recently reported that United States girls are matching boys in mathematical achievement.[5] Today in the U.S., 140 women enroll in higher education for every 100 men,[6] with women earning more than 50 percent of all bachelor's and master's degrees, and nearly 50 percent of all doctorates.[7]More important than the number of women earning degrees is the fact that they are obtaining the right degrees typically needed for successful careers in high-tech. As shown in Chart 1, women's participation in business and MBA programs has grown more than five-fold since the 1970s, and the increase in the number of engineering degrees granted to women grew almost 10-fold.[8]

Chart 1



In top technical programs at schools that have made a conscious effort to include women, the increase in female students far outpaces the average. For example, during the late 1990s, the number of female students entering Carnegie Mellon University's prestigious Computer Science program increased more than

five-fold, from 7 percent to 38 percent, in just five years.[9] While an expanded applicant pool nationwide accounted for some of the gain, much credit belongs with innovative programs developed to overcome barriers to female students entering computer science – without modifying admissions criteria.

The increase in female graduates at all levels is bearing fruit. In the late 1990s, Astia and Springboard Enterprises were two of the first organizations established to foster women's high-tech entrepreneurship. Of the more than 2,000 women who sought financing via their programs from 2000 to 2002, 100 percent held an undergraduate degree and 49 percent held graduate degrees. Among the advanced degrees, 31 percent were masters degrees in science or technology and 18 percent were MBAs.[10] In 2008, a group for high-tech entrepreneurs, Women 2.0, surveyed its 10,000 members. It found that all participants held at least one bachelor's degree and 38 percent also had a master's degree or a doctorate.[11] The slightly lower percentage of advanced degrees reflects an expanding pool of younger women entrepreneurs.

Appropriate Executive Experience

Former executives of venture-backed companies that have achieved successful exits are more "fundable". These are the serial entrepreneurs that venture capital investors seek out.

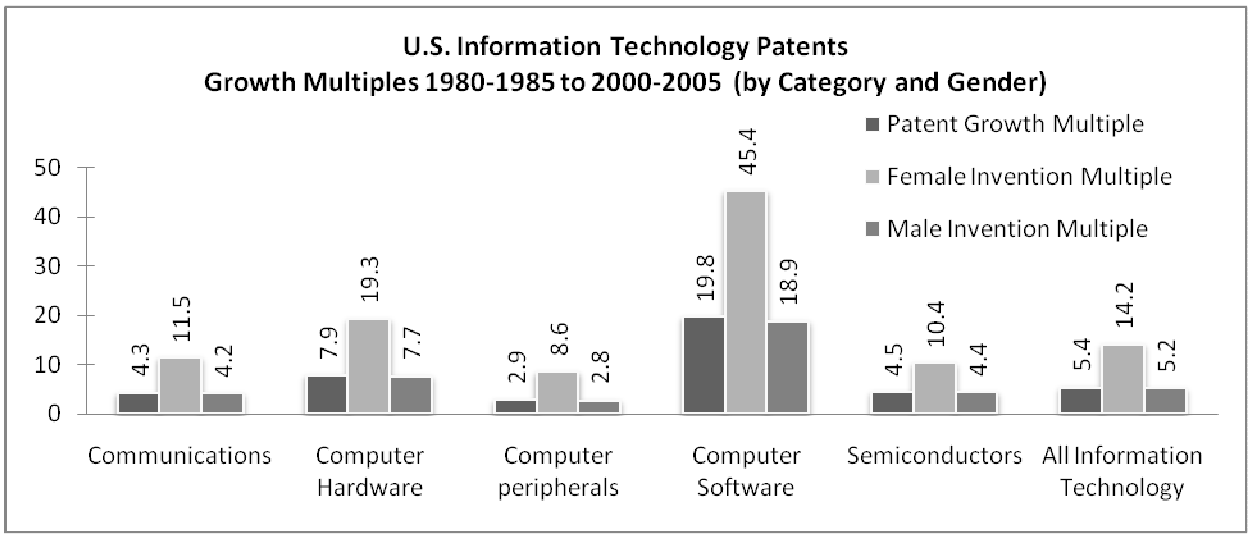
Today, more women are serving as officers of venture-backed companies with successful exits. They've made big progress in little time. Consider this: Using IPO data as a measure of successful exits, University of Michigan researchers found that only 4 percent of the 134 firms that went public in 1988 had women in top management positions. By 1996, 41 percent of the companies completing IPOs had female officers, a percentage that has remained fairly stable through 2007.[12]

Valuable Contributions to Technology

Leveraging their educations, women are rapidly expanding their contributions to technology. As of 2006, women held 27 percent of all professional computing-related positions in the United States, as well as 15 percent of CIO positions at Fortune 500 IT companies.[13]

The increase in the number of patents awarded to women illustrates the impact their contributions are having on the creation of intellectual property.[14] While overall U.S. patent activity increased five-fold from 2000 to 2005, U.S. female IT patenting experienced a 14-fold increase. U.S. female patenting grew most significantly in the computer software area. From 1980 to 1985, there were only 49 U.S. female-invented fractional software patents. From 2000 to 2005, the number of U.S. female-invented fractional software patents increased 45-fold, to over 2,200 patents. Today, women hold about 15 percent of all recent patents.[15]

Chart 2



WOMEN DELIVER INDISPUTABLE RESULTS

In recent decades, women have demonstrated their entrepreneurial determination by leaving large and mid-sized businesses to launch their own firms at an ever-quickening pace.[16] Between 1997 and 2006 women-owned or led firms were the fastest growing sector of new venture creation in the United States, increasing at five times the rate of all new firms. By 2005, one in five U.S. firms with revenue of $1 million or more was woman-owned. Today, women-owned companies represent nearly half of all privately held U.S. businesses.[17]

Women Build Capital-Efficient Companies

Studies show that companies built by women are more capital-efficient than those founded by men, using less capital to achieve the same or higher revenue performance in the early-stage years.

Extensive research documents these results. In the United States, the Kauffman Foundation's research shows that women-led high-tech companies typically launch with capital at levels 30 percent to 50 percent less than those led by men.[18] Kauffman research also indicates that venture capital investors see the performance of women-led firms in their portfolios is being on par with businesses led by men.[19] Library House, Ltd. research examined 600 European venture-backed companies in 2007 and found that those run by female chief executives delivered higher revenues using less capital than those headed by men. The average venture-backed company run by a woman had annual revenues that were 12 percent higher than those run by men using, on average, one-third less committed capital.[20]

Women-Founded Companies Have Lower Failure Rates

Despite the fact that women-founded high-tech companies may launch with less capital, they are more likely to survive the transition from raw start-up to established company than the norm. A joint project of the Center for Women's Leadership at Babson College and the London Business School showed that while female and male entrepreneurs in the United States expected similar growth potential of their businesses, the women achieved slightly higher ratios of transition to established businesses – experiencing fewer failures in moving from early to growth-stage companies than men.[21]

Women Achieve Venture-level Returns

We have identified more than 125 high-tech companies with more than 200 women as co-founders or in officer-level roles at the time of a successful IPO or an M&A exit of $50 million or more during past ten years. Our research suggests an undercounting of women's outcomes, since M&A transactions dominate exits and valuations are frequently undisclosed. Like successful male founders, many of these women with venture-level outcomes are well on their way to success with their second or third start-up. More than 10 percent are already associated with two or more successful outcomes of venture-backed companies during this short ten-year period alone.

More women have helped lead private equity-backed companies to IPOs. In 2007, they were involved in over 55 percent of U.S. high-tech IPOs, up from involvement in less than 10 percent ten years earlier.[22] Of the 19 tech IPOs in 2009, all but two had at least one woman listed among the leadership ranks. These numbers demonstrate the continued expansion of the pool of high-tech female entrepreneurs with the ability to successfully launch and lead companies to profitable outcomes.

Gender Diversity Improves Performance

The depth of research confirming that gender diversity improves business results continues to grow. It applies to large and small companies alike. Quantitative research conducted by the University of Michigan's Scott Page with Lu Hong of Loyola University of Chicago modeled the impact of diversity on team performance.[23] Their work showed that groups with greater gender diversity perform significantly better than homogeneous ones in solving complex problems in virtually all circumstances.

Many other studies including Pepperdine University's 19-year study of business performance, Catalyst's recent four-year study of Fortune 500 companies[24] and IPO performance research conducted by the University of Michigan and Cornell University[25] found that companies with greater gender diversity out-performed those with less – frequently by as much as 30 percent.

To investigate the connection between women senior managers and company performance, David Gaddis Ross of Columbia University and Christian Dezsö of the University of Maryland examined such performance metrics as return on assets, return on equity and annual sales growth from 1992 to 2006 across 1,500 U.S. firms. They analyzed the relationship between these measures and the percentage of women in senior management positions.

"We have documented a strong positive association between firm performance and female participation in senior management," said Ross. "Firms with at least some female senior managers outperform firms without. We have also found that the more important innovation is to a firm's strategy, the greater the positive impact of female participation on firm performance. The upshot is that any firm, but particularly those for which innovation and creativity are a priority, would benefit from female participation in senior management."[26]

HOW WOMEN FUND THEIR COMPANIES TODAY

There is unequivocal evidence that women-owned businesses start with lower levels of overall capitalization, lower ratios of debt finance, and are much less likely to use equity capital than men.

Self-Financing

In the United States, start-ups in the IT sector frequently rely heavily on personal savings when launching, meaning that entrepreneurs themselves are often the most important source of start-up funds. Data from the National Center for Women in Information Technology shows the tendency to self-finance is even more likely among women founders. Factor in Harvard research showing that even today men earn on average 20 percent to 25 percent more than women with comparable backgrounds in corporate America and roughly 10 percent more in private companies. The overall result is that men have access to more start-up capital than women.[27] While capital-efficiency can have significant advantages, particularly during a company's early stages, limited access to growth capital or inappropriate capital structures can hurt the longer-term prospects of a company.

Debt Financing

Women's access to outside funding remains heavily dominated by bank finance. Women-led companies with over $1 million in revenue in the United States are twice as likely as companies led by men to seek debt versus equity capital.[28] This tendency to gain debt versus equity financing is positively influenced by lending programs established by the Small Business Administration and major institutional banks in recent years which significantly diminished the prior disparity in bank financing opportunities for women. Outside the United States, however, fee structures still seem to favor men. In the United Kingdom, for example, majority female-owned businesses pay significantly higher margins on term loans than male-owned businesses (2.9 percentage points versus 1.9 percentage points over base).[29]

Equity Financing

Equity financing frequently begins with an early-stage round of angel investment followed by venture capital funding once a company has achieved certain milestones. Overall, female entrepreneurs do not gain equity funding at the same rate as their male counterparts, although they fare significantly better at the angel versus venture capital level. Only 4 percent of women owning $1 million-dollar-plus firms gain equity funding compared to 11 percent of men in the same category.[30] This differential is due to a combination of factors identified in prior research ranging from a lack of proper introductions to unintentional investor bias. Women who succeeded in gaining equity funding reported contacting 25 to 30 potential equity investors, roughly five times the level of contacts required for women to gain debt financing.[31]

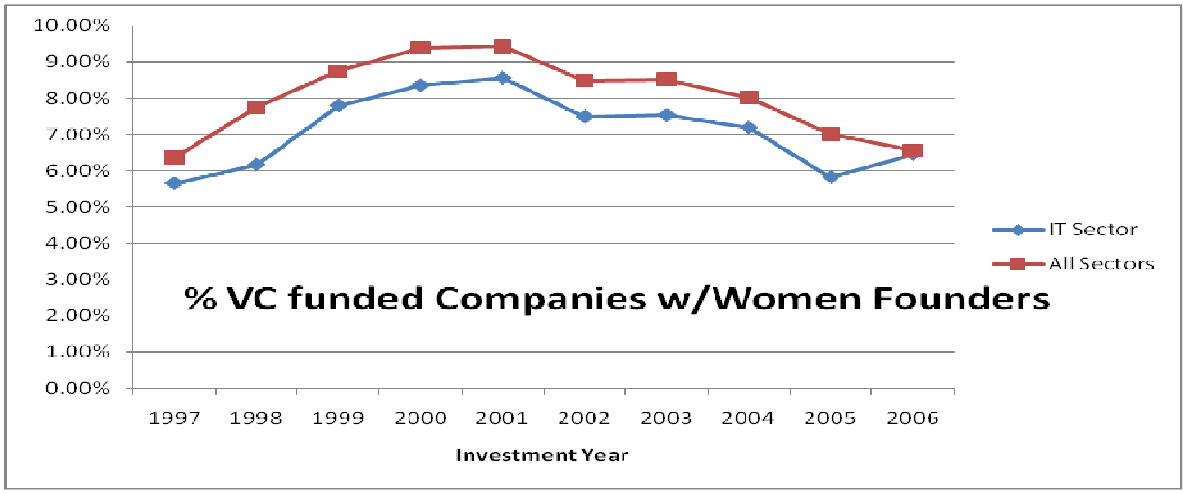
Angel Capital

The Center for Venture Research at the University of New Hampshire's Whittemore School of Business and Economics does extensive research on angel investing, frequently with an additional focus on women entrepreneurs and investors. Their research shows that women-co-founded companies in the United States accounted for 15.7 percent of the entrepreneurs that sought angel capital in 2008 and that they achieved a yield rate of actual investment that was slightly above the average yield rate for men.[32] Additionally, they showed that high-growth women-owned businesses are six to eight times more likely to successfully gain angel capital financing than venture capital.[33] Unfortunately, similar gender-specific application and yield data is not collected at the VC funding level.

Venture Capital

Venture funding of women-led companies has not yet reached critical mass, but is increasing. Between 1957 and 1998. 2.4 percent of venture capital financing went to female-led companies. For the first 23 years of that period, there was no year in which more than three woman-led companies were venture-backed.[34] In the past decade even as the number of start-up ready women grew, their presence at the co-founder level in venture-backed companies declined for several years after a peak in 2000 when women garnered over 9 percent of all equity investments, but only 2.3 percent of dollars. More recently the numbers have begun to rebound reaching 6.8 percent in 2007.[35] Chart 3 shows venture investment in women-led companies since 1997 and how the IT sector has lagged overall until quite recently.[36]

Chart 3



Lack of Equity Capital – Why It Matters

There is a wealth of research including recent work conducted at the Wharton School of Business showing that access to early stage equity financing plays a critical role in the successful start-up and development of entrepreneurial ventures.[37] Venture capital backed firms have been shown to outperform all others, with firms funded by friends and family or bank debt exhibiting much lower rates of growth.[38] Yet in spite of their limited access to equity capital, women continue to launch and build successful high-tech companies. Research shows that a combination of limited personal wealth, lack of access to equity investors and in some cases fear of losing control to a board made up of exclusively male investors represent some of the most significant factors that may cause women to accept more costly sources of funding to fuel their company's growth plans.[39]

The lack of access to equity funding has impact beyond cash-flow. It means less access to helpful resources such as functional and financial expertise, competitive intelligence, introductions to knowledgeable service

providers, customers, and distributors, as well as limited introductions to and credibility needed for recruiting key personnel. It's not surprising that women-founded businesses perform as well as those founded by men, but it's striking that they do so even when they are constrained by their financing.

EXPANDING WOMEN'S ACCESS TO EQUITY CAPITAL

Although today female entrepreneurs do not obtain equity funding at the same rate as their male counterparts their access is expanding. A dramatic increase in women angel investors, the efforts of women entrepreneur-focused non-profit groups and even limited partner investors with mandates that support a more inclusive investment strategy are positively impacting the financing of women entrepreneurs.

Impact of Women Investors

Investors typically give limited, if any, consideration to investment opportunities that come in without a personal introduction. Thus, it is critical for entrepreneurs to establish direct relationships or to gain high-quality referrals. Women's access to venture capital investors has historically been limited due, in part, to their lack of existing relationships and rapport with investors in this category.

Women angel investors represent just over 15 percent of total in the United States today. In venture capital firms, the numbers remain lower.[40] Less than 7 percent of VC investing partners are women.[41] Recent research suggests that increasing the number of women investors offers a much-higher impact approach to expanding funding of women-led businesses than may have been previously understood.

Studies conducted by researchers at the University of New Hampshire and others show that entrepreneurs demonstrate a strong predisposition to seek funding from members of the same sex.[42] Called homophily, this tendency refers to the selection of people based on characteristics such as gender, ethnicity, nationality and appearance and holds true for both men and women.

Homophily permeates all levels of equity investment. Data shows that women investors are far more likely to directly connect to and to be able to attract female-led ventures to their firms.[43] Angel groups, where women are at least 25 percent of the investors, see almost three times the deal flow (32 percent versus 13 percent) from women-led companies in comparison to groups dominated by men.[44] Data from the Kauffman Foundation's Diana Project showed that firms with women investment partners are 70 percent more likely to lead an investment in a women entrepreneur than those with only male partners.

Organizations that include women investors are three to four times more likely to invest in a women-led business. Increasing the number of women investors, therefore, becomes a critical success factor for increasing women's access to equity capital. While only 10 percent of all asset managers in the United States overall are women, a transition is already underway within certain sectors.[45]

Angel capital investors are the oldest and largest source of seed and equity capital for high growth businesses and women now represent the fastest growing segment of this financing category. In the United States, women increased their presence among angels from 3 percent in 2000 to 8 percent in 2005,[46] then from 12 percent of angel investors in 2007 to 15 percent in 2008.[47]

Since the majority of angel investors are cashed-out entrepreneurs who started and exited their own businesses, the expanding pool of women-owned businesses suggests there will be continued increases in women's participation in angel networks.[48]

The venture capital industry, however, has not kept pace with angel or many other asset management categories. Our research shows limited participation by women at investment decision-making levels at the 50 most active venture capital firms in the U.S. high-tech sector. Among these firms, nearly two thirds (32) do not have even one woman investing partner and only three of the firms have more than one.[49]

Women Partners in Fifty Most Active U.S. VC Firms in IT (7/07-7/09)

Total Funds Managed	% Women
$250M- $1B	1.43%
$1B-2.5B	3.78%
Above $2.5B	6.89%
Average	5.12%

However, among the smaller and newer firms, the percentage of women managing directors and general partners is higher. In the 50 most active firms in the IT sector with between $50 million and $250 million under management, women hold more than twice (10.37 percent) the average number of investing partner seats as in the largest active firms. The slow pace of transition governed by the 10-year partnerships that dominate venture capital can thus be accelerated by new, innovative firms entering the market. Changes in women's work experience and educational backgrounds in management and IT will increase their acceptance in this sector over time.[50]

In recognizing that roughly twice the percentage of women entrepreneurs receive angel versus venture capital, it is not coincidental that women represent more than twice the percentage of angel investors as venture capital investors in the United States today. Whether as angels or as venture capitalists, adding more women investors will expand women entrepreneurs' access to equity capital and increase their participation in the high-tech sector. [51]

Changing Pattern Recognition

Ask 100 experienced venture investors how they know a good investment opportunity when they see it and 99 will respond with the words "pattern recognition". For women and non-white males seeking funding this has been one of the toughest barriers to overcome.

Research conducted at Stanford University and at the Simmons College School of Management shows that investors have a set of criteria that they use to quickly assess any investment opportunity. The Simmons study described the venture capital investors' mental filter as "a template consciously and unconsciously developed over time within an institutionalized context and based on the venture capitalist's experience with mostly male-led venture projects, fostered by industry preferences and patterns of behavior, formed by education and networks, and guided by personal life experience."[52] Outside academia, the potentially exclusionary impact of pattern recognition was illustrated by comments made in 2008 at the National Venture Capital Association's annual conference by a leading partner in a top-tier Silicon Valley firm. When asked to share secrets of his success, he responded by recommending investing in "white male nerds who've dropped out of Harvard or Stanford."[53]

Exacerbating the often-subconscious choices fostered by pattern recognition is the historical lack of recognition of women's successes in the high-tech sector. Despite the gains made by women, press coverage declined in recent years making them nearly "invisible entrepreneurs."[54] This hides their innovations and their returns to investors. Today, groups like the Anita Borg Institute for Women in Technology, the National Center for Women in Information Technology and others focus on women's success in science and technology. These groups have helped to highlight companies founded or led by women that have created or changed entire sectors. Think of Diane Green creating VMWare, the multi-billion dollar data virtualization product category. Donna Dubinsky launched Palm and Handspring, companies which revolutionized the way all of us work and communicate, first with PDAs and then with smartphones.

As women entrepreneurs continue to perform as well or better than their male counterparts and their achievements are recognized, new patterns of success will be acknowledged and accepted by a broader cross-section of investors.

ROAD FOR WOMEN MAPPED BY INDIAN ENTREPRENEURS

Nearly 30 years ago, the invisible U.S. entrepreneurs were Indian immigrants. Interviews with members of The Indus Entrepreneurs (TiE) organization suggest their emergence and acceptance in Silicon Valley progress is now mirrored by women-founded high-tech start-ups.[55]

In the early 1980s, the shortage of IT professionals in the United States created an opportunity for well-educated and entrepreneurial Indian men. As they filled a critical industry-wide staffing gap, some found themselves at start-ups. As the start-ups had successful outcomes, the Indians benefited financially and started their own companies. At first many of these immigrants relied on each other for funding, initially growing their companies with little or no financing from outside their community. Once Indian entrepreneurs achieved venture-level outcomes, some re-invented themselves as venture capitalists and began funding other talented Indian entrepreneurs, among others.

When it became clear that these entrepreneurs performed as well as their white male American peers, the Indians eventually found themselves perceived as venture-backable and became highly sought-after entrepreneurs by a broad cross-section of venture capitalists. This cycle took two to three decades to complete.

Today's female entrepreneurs are on a similar path. In response to both market need and personal desires, women are gaining more of the right educational backgrounds and work experience. As with the early Indian entrepreneurs, they are entering the market with the right educations and skills in larger numbers and at a point when there is a growing shortage of both engineering and management talent in the United States. The growing pool of successful women with venture-level outcomes, and the increased presence of executive-level women in corporate organizations will also lead to more women assuming investing roles as angels and venture capitalists, much as the Indians did.

FUNDING GAP INVESTMENT OPPORTUNITY

The financing issues for women entrepreneurs continue well beyond the start-up phase. The Kauffman Foundation's ongoing longitudinal study has tracked more than 500 firms in the tech sector, 100 of which have women founders, since their founding in 2004. The study looks at financing strategies and a variety of other measurements. It shows significant disparity between the financing of women-led companies into their fourth year of doing business. At that stage external equity represented one in four dollars of total financing for men, but remained negligible for women.[56] Significant differences in access to and application of capital between male and female founders have also been confirmed outside the United States. Recent international research completed by Delta Economics shows that in early stage companies women are twice as likely to use bank debt (68 percent versus 34 percent) versus men, while men are more than four times more likely than women to use outside investors such as angel financing (36 percent versus 8 percent).[57] Our research suggests this imbalance in equity financing presents an investment opportunity.

Strategies for Success

In the late 1990s, the first investors to recognize the opportunity to leverage the market discontinuity created by women's limited access to equity capital raised a number of small venture capital funds designed to exploit this opportunity. Victims of bad timing, some succumbed to the dot.com bust and others to more fundamental strategic flaws. For example, several of the firms launched in geographies where the lack of women entrepreneurs made it difficult to be selective, or where there were few other venture capital firms to help with follow-on financing. Some of the firms deployed their capital in capital-intensive sectors during a period of all-time-high valuations or where, lacking prior experience, they could add limited value as board members.

Our research has identified factors that will help ensure positive outcomes for future efforts supporting women entrepreneurs.[58]

Investment criteria - Use the same criteria for all investments. Avoid limiting deal flow with a women-only requirement. Seek to include a disproportionate share of women-led companies and more diverse companies overall, but evaluate and invest using gender-neutral criteria.

Sectors - Focus on high-growth, scalable businesses that will attract high-quality co-investors for follow-on financings and that will lead to venture-level returns. Invest where you can add value.

Capital - Raise capital at levels that are appropriate for the investment style and reserve sufficient levels of capital to support participation in follow-on financings. Deploy funds into capital-efficient companies, always bearing in mind vintage year risks.

Teams - Build investing teams with prior hands-on operational experience in the target sectors and stages of investment interest. Reinforce the internal team with world-class service providers and advisors.

Deal flow - Ensure differentiated access to entrepreneurs through affiliations, relationships and innovative strategies. Leverage proprietary deal flow to gain the best co-investors.

Geography - Choose primary locations where both the number of well-qualified target entrepreneurs and the support infrastructure are adequate to support the portfolio. Nurture others opportunistically.

Brand - Make it clear why the best entrepreneurs seeking capital would want to do business with the firm.

WOMEN ENTREPRENEURS GAINING CRITICAL MASS

In any new category, there is a period of time needed to build an appropriate pool of talent to feed into the funnel with the goal of creating a sustainable pipeline. The funnel must be filled with those having the right education, experience and skills. Yet only a small percentage of qualified professionals, no matter their gender, decide to become entrepreneurs and flow into the small-diameter pipeline attached to the funnel's bottom.

Now, after decades of transition, many women with the credentials to become successful co-founders and leaders of high-tech firms are choosing to start companies in venture-backable sectors. Research shows that women are starting businesses in the same ratios as men in high-growth technology markets such as software, communications, consumer Internet and security that have traditionally been considered fitting for venture investment. Data gathered in 2004 shows that the industry profile of women-owned $1 million-plus firms is very similar to that of firms owned by men. A little more than a quarter of both female and male firms are in the service sector. In other industry sectors, such as manufacturing and wholesale trade, they are represented fairly equally as well.[59]

There are further indications that the percentage of the women-founded or women-led high-tech companies is poised to grow rapidly. The current generation of young women, prolific users of, and contributors to technology will further expand the representation of women in high-tech. Among teens, 56 percent of Facebook users are female. On the Web, 75 percent more girls blog than boys and 45 percent more girls create web pages than boys.[60]

Furthermore, following on the heels of the early organizations fostering women's entrepreneurship in the high-tech sector, a second wave of women's high-tech groups has arisen in recent years. Some, such as SD Forum Women are affiliates of existing larger mixed-gender organizations while others, like Women 2.0, are independent groups. Women 2.0, for example, was formed in 2006 as a small, local organization for the "next generation of woman founders" of high-tech businesses. In three years it has grown to over 10,000 online members nationwide. The typical member is 21 to 45 years old. Eighty percent of members are currently in start-ups and 90 percent are already in management roles in high-tech.[61]

While most of these groups are nationwide in scope, the majority of their membership is in California and particularly in the San Francisco Bay Area. This is consistent with research conducted in 2008 at Harvard

University showing that nearly 30 percent of all women with experience as start-up executives worked for companies headquartered in California. Massachusetts, with just under 17 percent of start-up women execs, holds the next largest pool of this talent in the country and no other state has more than 5.5 percent.[62]

Research shows that, on average, men start businesses when they are 25 to 35 years-old while women historically start businesses when they are 35 to 45 years-old.[63] Given this age-related factor and the relatively recent time frame in which women have begun to gain any significant scale in terms of appropriate educations and work experience, we expect rapid growth in women-founded or led high-tech companies in coming years.

CONCLUSION

In this paper, we have shown that there are more appropriately educated, well-qualified and eager women entrepreneurs in the market today than ever before. Nonetheless, we have also found that it will take more than an expanded pool of women entrepreneurs to create an environment that recognizes their investment value in equal ratios to men. We have had the opportunity to see this kind of massive transition take place in the high-tech economy at least once in the recent past as our Indian colleagues who were effectively treated as second-class citizens 30 years ago have become some of the most sought-after entrepreneurs in Silicon Valley. Such change can and will happen again when financial rewards for doing so are evident.

We expect women to lead the next wave of opportunity. Women-led high-tech start-ups generate higher revenues per dollar of invested capital and have lower failure rates than those led by men. Data clearly shows that high-tech venture-backed companies founded by women do as well as those led by men despite often being capital-constrained. Portfolios that lack this diversity are likely to suffer over time.

The wariness instilled in investors with the burst of the high-tech bubble in the early 2000s led to a major retrenchment – funds were reduced in size, much of the new blood in venture capital was eliminated and investment decisions took a more conservative approach, focusing on what had succeeded in the past – investments led by and in men. A period of inertia followed with only marginal expansion of investor or investment diversity. Today, as we recover from another unprecedented economic downturn, limited partner investors and direct high-tech investors alike are seeking new ways of doing business. With a return to smaller funds, the bywords are capital-efficiency and risk mitigation – already characteristics of many women-led high-tech businesses.

The current discontinuity that exists between the growing numbers of women entrepreneurs and actual investment levels creates a unique investment opportunity. Our research suggests that investors who are well positioned to tap into this emerging sector and who apply innovative strategies designed to fit capital-efficient outcomes will be well positioned to deliver advantaged investment returns.

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ABOUT THE AUTHOR

Cindy Padnos is the founding managing director of Illuminate Ventures (www.illuminate.com), a high-tech focused venture capital firm based in the San Francisco Bay Area. Launched in 2009, Illuminate combines new and unique thinking regarding deal flow and investment structure with some of the historical best practices of traditional venture capital models. Illuminate invests in innovative companies led by committed, talented and diverse teams, particularly those that are inclusive of women entrepreneurs. A core tenant of the firm is that team diversity enables higher levels of innovation and overall investment performance.

Ms. Padnos has been an active member of the venture capital community since 2002. Prior to founding Illuminate, she was a director of Outlook Ventures where she was one of three investment professionals responsible for committing the firm's $140 million fund. During her tenure, Ms. Padnos sourced more than half of the firm's new investments including companies in the consumer internet, IT infrastructure, software/SaaS and mobile application spaces and demonstrated a track record of performance.

Previously, as an operating executive, Ms. Padnos helped deliver successful outcomes for several venture-backed start-ups. She was founder and CEO of Vivant, (Acq. EVLV), and served as president & CEO for Acumen (pvt. M&A) and vice president of marketing at Scopus Technology (IPO). She also held senior management positions at IDE, Ingres and at AT&T. Early in her career Ms. Padnos developed her market assessment capabilities and love of innovation in the high-tech sector as a management consultant in the IT practices of Arthur D. Little and Booz, Allen & Hamilton.

Ms. Padnos received her MBA, with honors, from the Tepper School of Business at Carnegie Mellon University and her AB, *magna cum laude*, from the University of Michigan. She currently serves as an advisor to Astia, The Tepper School and Women 2.0. She is a board member for privately held companies BrightEdge, CalmSea, LPI&M, Wild Pockets and Xactly Corporation.

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