



## **Access to Financial Capital:**

### **A Review of Research Literature on Women's Entrepreneurship in the Information Technology Field**

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Women entrepreneurs have less access to or make less use of financial capital<sup>1</sup> than do men entrepreneurs. Many causes have been hypothesized to explain this gender difference in funding for entrepreneurship. The difference may stem from women's propensity to self-finance; the size, age, and industry of women's businesses; women's insufficient human or social capital; women's low participation in the best-funded industries; and perhaps, women's underrepresentation among funders.

In contrast to typical financing of businesses run by men, women are much more likely to self-finance their business (Treichel and Scott, 2006). Rather than go into debt or sell shares, women are most likely to use personal savings, earnings from the business, home equity loans, credit cards, and family loans to finance their business. Their reason for self-financing is no longer thought to be discrimination in access to capital. Social science literature from the 1970s to the early 1990s often pointed to discrimination,<sup>2</sup> but that claim is now much less likely to be made. Recent scholarship shows that the characteristics of women-owned businesses may explain why women obtain smaller loans, pay higher interest rates, must put up higher collateral, experience a higher incidence of unmet credit needs, and express lower satisfaction with the bank loan process.<sup>3</sup> Women-owned businesses are smaller, younger, and more likely to be in retail or service industries than businesses owned by men. All of these characteristics receive less favorable treatment from bankers regardless of whether the business is owned by a woman or a man.

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<sup>1</sup> Capital for starting or growing a small business comes from two types of sources: debt sources and equity funding. Debt sources include commercial banks and trade credit. Equity funding includes self-financing, funding from friends and family, and outsider equity such as angel investors and venture capital. Small businesses rely about equally on debt and equity, according to data from the Federal Reserve System's 1993 Survey of Small Business Finance (Berger and Udell, 2002). Among equity sources, small businesses are much more likely to rely on insider funds or retained earnings, followed by funding from family and friends. Outside equity such as angel investment and venture capital provides less than 6% of total funding. Among debt sources, commercial banks provide about two-thirds of debt funding while trade credit makes up the other third.

<sup>2</sup> See, for example, Schwartz, 1979; and Riding and Swift, 1990. Buttner and Rosen, 1989, on possible discrimination by bank loan officers, is one of the most widely cited articles in this literature. A more recent article, Haynes et al., 2000, argues that bankers often evaluate business credit-worthiness of an entrepreneur based upon the entrepreneur's personal financial situation; and that while this works well for men-owned small businesses, it works less well for women-owned small businesses both because of the nature of the industry sector in which their business is located and because these women entrepreneurs are more likely to use an extended family model of financing than men are. As bankers moved away from subjective evaluations of the five C's of credit (character, capacity, collateral, conditions, and capital) toward more objective loan-scoring methods for determining credit-worthiness, it was expected that women would be treated more equitably.

<sup>3</sup> See, for example, Fabowale, Orser, and Riding, 1995.

A recent study provides evidence that firm characteristics, rather than discrimination, explain the gender difference in financing by debt capital from outside sources. Data from a 1993 nationally representative sample of over 4,000 small businesses show that it is overly simplistic to claim that women apply for loans less often than men and that they are turned down more often than men (Coleman, 2002). According to this research, a more accurate statement is that women's access to debt capital is limited by their lesser education and business experience, inability or resistance to providing collateral or personal guarantees, and smaller firm size (Coleman, 2002).<sup>4</sup> There was no evidence of discrimination – "Gender did not predict the level of total debt or the level of externally acquired debt. Similarly, women were not significantly more or less likely to apply for or to obtain a loan" (Coleman, 2002, p 168). Rather than gender, this study shows that other characteristics of the firm owner and of the firm determine access to equity capital.

Gender discrimination in bank loans may not be a reality, but the perception that women have a harder time securing bank loans may itself be a factor in their disinclination to apply for loans or apply for loans in smaller amounts.<sup>5</sup> Gender is related to both the number of applications for bank loans and the size of loans, according to a comprehensive study by Treichel and Scott (2006). However, their analysis of data, which was taken from 1987, 1995, and 2001 National Federation of Independent Business surveys, found no evidence that gender is related to number of turndowns. Based on this study, it appears that women entrepreneurs censor their own debt funding through commercial banks.

Equity funding, such as self-financing or funding from friends, family, angel investors, or venture capital, may also be affected by women's behavior or circumstances. In particular, human and social capital may affect use of equity funding. The human capital of a business comprises the education, training, and work experience of its key workers. Educational elements of human capital have to do with both the amount and type of education, such as a liberal arts background versus a technical or business degree, and the level of education specifically focused on entrepreneurship. Work elements of human capital include experience in the same line of business, the amount of management experience the key individuals in the business have acquired, and their experience with start-ups. Social capital is essentially one's network of useful social connections. These connections grant access to resources, including information, held by members of one's network.

Evidence is mixed regarding the influence of human and social capital on equity funding. One recent study (Carter et al., 2003) considers the importance of human and social capital in the ability of women to obtain equity financing, but finds the explanatory power of these concepts is limited. Another study finds that one particular type of human capital affects equity funding. Graduate education increases the likelihood that women seek outside equity funding according to a survey of 235 women business owners conducted in 2000 by the National Foundation for Women Business Owners (Carter et al., 2003). Other elements of human capital – financial acumen, start-up experience, or managerial experience – had no measurable effect.<sup>6</sup>

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<sup>4</sup> It appears that these characteristics also play a significant role in men's access to capital. In their careful study of 300 male-owned and 300 female-owned businesses in Britain, Carter and Rosa (1998) found only a few gender differences in financing: men used significantly more start-up capital than women and this affected long-term business performance; and women were less likely than men to use institutional financing, such as bank loans and supplier credit. Men were most often refused financing on the basis of industry sector and education, while women were most often refused financing on the basis of business track record and domestic circumstances. In most other ways, there were few gender differences in the financing of these businesses.

<sup>5</sup> See, for example, Haines et al., 1999; Uzzi, 1999; and Coleman, 2000. However, Cavalluzzo et al., 2002 and Robb and Walken, 2002 showed no gender difference in bank applications after controlling for credit history, assets, sales, and years in business.

<sup>6</sup> Another study, Colombo and Grilli, 2005, of 500 high-tech start-up firms in Italy, found that university education in economics and management, and to a lesser degree in science and engineering disciplines, had a positive correlation with firm growth. They also found that firms that had at least one senior manager with entrepreneurial experience helped with firm growth, as did having combinations of complementary skills and experience on the management team, such as

Social capital has limited effects according to the same study of women business owners (Carter et al., 2003). Social capital does not increase the likelihood of seeking outside equity funding, but it does have two notable effects. First, it increases the use of “bootstrapping” techniques. Bootstrapping “involves the use of personal and internally generated funds for business investment, the control of costs and the delay of capital expenditure until such funds are available” (Carter et al., 2003).<sup>7</sup> Whether women use bootstrapping to prepare for the equity markets remains unknown. Second, the nature of social capital affects women’s funding behavior. Network diversity, measured as the number of different kinds of people the business owner contacts regularly about general business issues, correlates positively with using personal sources of funding to operate the business. And strong ties to a professional business advisor negatively correlate with using personal sources of funding to operate the business.

Another source of outside equity funding – venture capital – flows most often to industries where women are poorly represented (Greene et al., 2001). The same large study that reached this conclusion also suggests that women in technology may be at a disadvantage.<sup>8</sup> Greene et al. report that between 1988 and 1998, the number of women-owned business receiving venture capital funding increased rapidly. This increase tracked increases in the U.S. venture capital market overall, so there was no noticeable increase in the percentage of businesses owned by women receiving venture capital funding. The number hovered in the 4% range, but there were differences across industry sectors. Venture capital investments were not made at all in the agricultural and mining sectors, and no investments were made to women-owned businesses in the construction, public administration, or finance, insurance, and real estate sectors. Investments to women were primarily made to firms in the service sector, while investments to men were made primarily in the manufacturing sector. There were significant differences between men- and women-led firms at both the early stage of investment and the buyout/acquisition stage. Women were more likely than men to receive their funding in the early stage, while men were more likely to receive their funding at the buyout/acquisition funding stage. Differences were not statistically significant at the intermediate stages of expansion prior to buyout or acquisition.

According to Greene et al., cross-industry patterns exist because “[v]enture capital dollars are attracted to specific industries in order to best maintain the risk/reward ratios most desirable to equity investors. In part, the lack of gender differences is due to the extremely small participation of women in agricultural, construction, finance, insurance and real estate. Notably, the predominant industry choices of female entrepreneurs appear to be mismatched with the industry preferences of venture capitalists. Female entrepreneurs historically were heavily concentrated in the service and retail sectors.”<sup>9</sup> There was, however, a statistically significant difference in underinvestment in women-led businesses compared to men-led businesses in the transportation

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one person with management experience and another with a technical background, or one with technical background and another with real-world experience in the industry of the firm.

<sup>7</sup> Bootstrapping often “involves a high reliance on internally generated retained earnings, leasing of equipment, customer advances, second mortgages and even use of credit cards to finance the operation. Cash flow or retained earnings subsequently fuels the business as owners position the venture for success in the private equity markets” (Carter et al., 2003).

<sup>8</sup> This data set from the National Venture Capital Association included over 16,000 usable records (truncated to 4,300 records for the purpose of this article). It contained thirty years of records, but the study focused only on 1988-1998, the period during which there was the largest number of women entrepreneurs to consider.

<sup>9</sup> However, a theory-driven study on gender ascription by Marlow and Patton (2005) argues that “to differing degrees, women face obstacles to gaining the credibility and resources required to engage fully and fairly with entrepreneurship in the current market economy. This situation does not occur because of a lack of ability or industry but because of the more invidious, complex, and multifaceted constraints arising from gendered characterizations which impose a further set of hurdles for many women entrepreneurs to negotiate.” The authors cite another paper (Brush, Carter, Gatewood, Green, & Hart, 2001), which argues that there are myths that women cannot generate businesses of interest to venture capitalists.

and communications industries. This difference might be based in lower support for women in technology businesses, but the data does not provide the opportunity to explore the issue further (Greene et al., 2001).

In addition to industry segregation, women's scarcity among funders could also contribute to gender differences in use of venture capital. The Kauffman Foundation (Brush et al., 2006) examined venture capitalists listed in the 1995 and 2000 editions of Pratt's Guide to Venture Capital Sources and surveys of women venture capitalists, and found that few women (about 10%) held professional positions in U.S. venture capital firms. Even fewer women held senior positions where they would have decision-making responsibility concerning which deals to make. Women in the venture capital industry tended to have less experience than their male counterparts and were likely to leave the industry at higher rates. Women's underrepresentation is likely due to recruiting practices - most venture capital firms recruit professional employees from technical backgrounds, and women are poorly represented in these academic disciplines. The study also found that women venture capitalists conduct their business in the same way as their male counterparts, relying heavily on referral networks that include both entrepreneurs they had funded and other venture capitalists, and they strongly denied having any preference for funding women entrepreneurs because of their gender. Women agree with their male counterparts that the venture capital business is gender-blind. Nevertheless, more women are supported by women venture capitalists than by their male counterparts. This fact may be due in part to the inclusion of more women in the networks of women venture capitalists, perhaps partly because of the reported phenomena of men in the venture capitalist firms referring women entrepreneurs to the women in their firm.

Clearly, there is a need for more research on the reasons for gender differences in access to financial capital.<sup>10</sup> For example, recent research has only begun to investigate the influence of women angel investors on women's access to financial capital. The first study of female angel investors in the United States considers eleven firms in 2002 and 2003 that either had at least 25% of their angel investors being women or at least 25% of the entrepreneurship presentations to the firm made by ventures whose management team contained at least one woman (Sohl and Hill, undated). This sample represented, in 2003 for example, some 300 investors. Every one of the eleven companies in the study indicated that providing funding to women entrepreneurs was one of their goals. This study by Sohl and Hill finds that their average firm considered about 30 presentations per year, about one-third from women. Approximately four investments were made per year. Women-led ventures were slightly less likely (as a percentage of presentations by gender) to receive funding than ventures led by men. Two-thirds of the funding from these firms was for seed and start-up ventures, a much higher percentage than among angel firms in general, which are increasingly providing follow-on funding instead. The majority of investments made by the firms studied here were in high tech, particularly manufacturing and software. Survey respondents reported that the angel investors in these firms were less experienced than angel investors in general - in early-stage ventures, pricing and structuring investments, and conducting due diligence and monitoring investments. They were, however, better at researching skills, more willing to ask questions, more inclusive and approachable, more patient in letting investments come to fruition, more collaborative, and less ego driven. The strengths and weaknesses observed in this small number of firms may or may not represent angel investors in general. Further study is needed to determine if these findings are reliable.

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<sup>10</sup> Brush et al. (2002) identifies gaps in the literature that subsequently received some attention. She calls for a unified treatment of the supply and demand side perspectives on venture capital. This unified treatment should use social capital theory to investigate such issues as norms, social networks, and social relationships, and how they have an effect on access to financial capital and other resources that make new firms more effective. Researchers would also investigate the structure of the venture capital industry, the impact of doing business in certain narrow ways in order to meet investor risk and return requirements, and the value of social legitimacy as well as technical contribution in deal-making. In addition, Brush et al. call for more study of angel investors, who often offer the initial funding that prepares a firm for a successful venture capital request.

Women's underrepresentation among venture capitalists is not limited to the United States. New Zealand also exhibits low participation of women in venture capital firms. According to De Bruin and Flint-Hartle (2005) the young venture capital industry (venture capital, private equity, and angel funding) in this country has few women in key decision-making positions (11%), and makes few investments in women-led companies (3%). Nevertheless, the venture capitalists in this small study<sup>11</sup> argued that gender was not a factor in making investments, only commercial viability and growth orientation of the venture are considered. The women, who were in information and communication technologies, biotechnologies, and creative industries, tended to seek angel funding, invest their own savings, borrow on credit cards, or bootstrap by reinvesting proceeds from the company. Women usually sought venture capital only if their company was large, growth minded, or interested in the export market. Several of the women entrepreneurs interviewed were reluctant to engage venture capitalists for fear of loss of independence, autonomy, and control.

In sum, the research on women's access to financial capital explores aspects of the funding market and process to varying degrees. Evidence to date suggests that gender differences in types of funding sought and experiences when seeking funding exist for the most part due to women's concentration in poorly-funded industries, and perhaps due to their lack of technical education and their underrepresentation among investors. Access to funding for women in high-tech industries may be particularly difficult, but only one study considered this issue.

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<sup>11</sup> Interviews were conducted with 11 venture capitalists and 40 successful women entrepreneurs, and surveys were conducted with 29 venture capitalists, mostly in New Zealand's information and communication technologies, biotechnology, and creative industries.

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*This paper was produced in 2007 on behalf of the National Center for Women & Information Technology with generous support from the Ewing Marion Kauffman Foundation.*



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