

Breaking the “Bamboo Curtain” and the “Glass Ceiling”: The Experience of Women Entrepreneurs in High-Tech Industries in an Emerging Market

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ABSTRACT. Despite the role women play in job creation, economic growth and society revitalization, especially in economies undergoing fundamental transformations, issues emerging from women in entrepreneurship have not received adequate attention in academic research. As a result, our understanding of women entrepreneurship in emerging markets as well as in nontraditional industries is even more limited. In this study, I attempt to partially fill the gap by comparing entrepreneurial orientations and venture performance between men and women entrepreneurs in electronics industry in Chinese transition economy. I offer insights gained from statistical analyses based on a survey as well as case study. Results reveal that while women are influenced by the same factors that affect decision making among men and exhibit some similarities, they differ from men in their willingness to take more risks and make bolder moves in pursuit of greater returns and future competitive advantage. In addition, women entrepreneurs outperform their male counterparts. I compare these findings with existing literature and offer suggestions for future research.

KEY WORDS: China, entrepreneurship, gender bias, high-tech industries, women

“Women can hold up half the sky.” – Mao Zedong

For centuries, Chinese women have been separated from social and economic life by a “bamboo curtain,” and when they finally have a chance to make contributions not only to their family, but also directly to the society previously dominated by men, they soon find themselves under a “glass ceiling.” Like women elsewhere in the world, many of them refuse to fall victim and set out to create opportunities for themselves. However, while research on women entrepreneurship in the West has not received adequate attention, our understandings of women entrepreneurship in other national and cultural contexts are even more limited. As women play, increasingly an important role in starting and growing venture businesses in not only traditional industries, but also those industries that were previously dominated by men, improved knowledge about their decision-making process has become more important for theory and practice.

Entrepreneurship research has examined behavioral characteristics such as personalities and traits, gender, education, and individual background, and how these attributes have been associated with entrepreneurial decisions and outcome. For instance, certain psychological traits of individual entrepreneurs such as a propensity toward risk-taking (Begley and Boyd, 1987), high-achievement need (McClelland, 1961), or an internal locus of control

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(Brockhaus and Horwitz, 1986) have been found to attribute to entrepreneurship. Similarly, sociological and anthropological characteristics such as being a first child, being an immigrant, having early role models, as well as gender difference, have been associated with an entrepreneurial personality (Bird, 1989). However, the impact of such factors on entrepreneurial strategy and venture performance is far from conclusive. For instance, Olsen et al. (2003) recently called for more attention on the role of women on entrepreneurship due to contradictory and competing conclusions in the literature. More specifically, as Olsen et al. (2003) noted, while some argued that women are sources of problems for small enterprises, others considered women as positive factor. Clearly, such contradictions constitute a paradox in entrepreneurship research.

In order to address such theoretical tension, it is important to consider factors external to the entrepreneurial venture, because institutions, values, regulations, and family and support systems, when grouped together, form an institutional framework that strongly influences the development of entrepreneurs (Aldrich and Wiedenmayer, 1993; Bloodgood et al., 1995). More importantly, research needs to focus on the interaction between the economic actors and the environmental context (Covin and Slevin, 1991). While entrepreneurial strategy is increasingly being shaped by forces external to the entrepreneurial venture, entrepreneurs do not just react to environmental changes; they proactively “enact their own environments” (Levinthal and March, 1993: 99). For studies of entrepreneurship in environment undergoing fundamental transitions, such perspective has been shown to offer a unique insight on how organizational environment and entrepreneurial strategic adaptations interact and coevolve over time (Tan and Tan, 2005).

To join the debate, and to take the paradox constructively, I consider women entrepreneurs as agents of change between environmental forces and venture businesses, and focus on the question “what an entrepreneur does rather than on whom the entrepreneur is” (Lee and Peterson, 2000). My focus is on the entrepreneurs who demonstrate initiative or decision-making competence and seize opportunities, and how their decision-making competence has been translated into improved performance. I examine such issues by comparing and contrasting

male and female entrepreneurs in an environment characterized by continuous institutional transition and industry evolution, set in the People’s Republic of China, an economy that is moving from state central planning of the past toward market driven economy.

Women and entrepreneurship: theory and practice

Entrepreneurship literature reveals that there are certain characteristics that entrepreneurs all have in common, whether male or female. Among the psychological, attitudinal, and other background factors investigated, there were more similarities between men and women entrepreneurs than there were differences. Characteristics held to be typical for entrepreneurs such as need for achievement, risk taking propensity, innovativeness, independence and inner locus of control were similar for men and women (Ahl, 2003; Masters and Meier, 1988; Neider, 1987; Sexton and Bowman-Upton, 1990; Zapalska, 1997). Management practices were also largely similar between the sexes (Chaganti, 1986; Olson and Currie, 1992; Van Auken et al., 1994). To achieve success with a business, a vision needs to be in place, with a focus on the future. Entrepreneurs must also understand that proactivity is essential, which means seizing the moment and taking initiative. Possessing a sense of aggressiveness is a common trait among women and men alike in order to be constantly on the look out for opportunities, and waiting to seize the moment is an important part of entrepreneurship. In conjunction, there must be a superior level of commitment of time, money, and resources. Entrepreneurs always need to be willing to do the job right, with long-term success in mind rather than the short-term gain (Clark, 1999).

Furthermore, the start-up process is similar for men and women, and women appear to have no specific difficulties or information needs (Ahl, 2003; Birley et al., 1987; Bloodgood et al., 1995; Dolinsky, 1993; Nelson, 1987; Pellegrino and Reece, 1982). Men and women’s networking are similar, except for the gender composition which has little bearing on the effectiveness of the network (Aldrich et al., 1989; Andre, 1992; Cromie and Birley, 1992; Katz and Williams,

1997; Smeltzer and Fann, 1989). Women seem to face discrimination when it comes to financing, as reported in several studies, but the explanations appear to be confounded by some contextual factors; they own the types of businesses that banks associate with higher risks (Buttner and Rosen, 1989, 1992; Carter and Rosa, 1998; Coleman, 2000; Fabowale et al., 1995; Fay and Williams, 1993; Riding and Swift, 1990). In terms of performance difference, the myth of female underperformance did not hold when put to rigorous tests accounting for structural factors, as shown in a comprehensive test of 4,200 Swedish entrepreneurs (DuRietz and Henrekson, 2000). In that case the authors stated that women entrepreneurs on an average are less growth oriented than their male counterparts. When such differences in preferences were taken into account as well, there seemed to be no support for the hypothesis that men outperform women counterparts (Buttner and Moore, 1997; Cliff, 1998).

Women entrepreneurs have also been found to share some common traits. They are more frequently married, have children, are well educated, and somewhat older than their female managerial counterparts (Bowen and Hisrich, 1986; Hisrich and Brush, 1986; Shapero and Sokol, 1982). They possess a greater amount of autonomy, optimal use of capabilities, scheduling flexibility, power and extended financial parameters (Brodsky, 1993) and customarily illustrate their business in family terms and envision their business relationships as a network. Behind the driving factor of motivation and productivity is women's "personal touch." Women are also multitask individuals, having the ability to balance chores and priorities. Being flexible and adaptable is an essential quality to possess, whether in business for oneself or for someone else, especially when responsibilities include performing multiple duties (U.S. Small Business Administration, 1999). Another characteristic among female entrepreneurs is the joy, success, and satisfaction brought to them by attentively building relationships with customers and employees, mastering control of their own destiny, and from accomplishing something that they consider worthwhile.

Additionally, the literature on women in entrepreneurship suggests that women face some unique challenges when they start and grow their own business venture. They face stereotyping early in

their life and were often directed toward self-selection that favors certain career paths in the future. For instance, socio-cultural influences have led more women to receive liberal arts education rather than in technical and financial areas. Such choices have led more women to choose traditional and life-style business ventures, a choice often translated into more difficulties in getting financial for growth. Despite these obstacles, women were often motivated to start their own venture when they felt they were "displaced," either by lack of employment opportunities or due to the "glass ceiling" that restricts their growth potential in previous jobs. For this reason, women may be "pushed" into an entrepreneurial venture by the need for a solution to an existing problem, rather than out of a genuine wish to start up a business. Factors in this category can for example be unemployment, dissatisfaction with the present/previous employer and/or job, inheritance, and the need to provide for the family. While these "push" elements have received most of the attention in research, women may also be "pulled" into an entrepreneurial venture to leverage resources and pursue an opportunity to develop an idea, to receive high income, to fulfill oneself, and to be their own boss and not having to take orders from others. Such motivation, however, has not received sufficient attention in empirical research.

In sum, current literature offered inconsistent predictions, and empirical evidence is far from being conclusive. Most of the studies have focused on industries historically represented by women, but such selection has resulted in narrow focus, thus reducing the robustness of findings. Furthermore, while there have been efforts to examine women's role in other national contexts, women entrepreneurs in former centrally planned economies have received little attention, leaving explanations to field experts in anthropology, economics, and sociology. To demonstrate the ethnocentric orientation of entrepreneurship research, Ahl (2003) reported that among published articles she examined, 64% of the articles were based in the USA, and adding those studies based in other market based economies, 83% of studies on women in entrepreneurship came from the Anglo-Saxon sphere. Such high concentration may imply difficulties when translating the results across cultures, a point seldom made in the literature. The current body of literature based on market

economies assumes that the focal entrepreneur, whether men or women, operates in environments where property rights are protected, factor market is well-developed, and the entrepreneur has substantial discretion over the allocation of resources. Whether insights gained from such context can be extended to different institutional environment is still a question mark.

To partially fill such gap, I move the attention to women entrepreneurs who venture in transition economies, i.e., the former centrally planned economies moving toward market-based economies, such as the People's Republic of China.

Women entrepreneurs in transition economies

Although entrepreneurship is a relatively new concept in many developing and transition economies, women in these developing and transition economies already are playing an increasing role. Yet despite the increasing role women entrepreneurs play in transition economies, theory development, and empirical evidence only offer a very blurry picture of women entrepreneurs. Recently, Welter et al. (2003) suggest that women entrepreneurs are of special significance in a transition context, because they tend to more frequently employ other women, which help to reduce the effect of discrimination against women in the labor market, and serve as role models for younger generations demonstrating new opportunities for employment. In addition, by encouraging potential female entrepreneurs to start businesses, it could result in a more successful if not more rapid transition process through increased innovative capacities and private sector development. Yet despite increasing attention on SMEs and entrepreneurship in transition economies, very little is known specifically about female entrepreneurship. Among the few studies that have applied mainstream organizational theories to analyze women entrepreneurship in transition economies, Welter et al. (2003) have applied institutional theory to female entrepreneurship development in the former Soviet republic and offered perhaps the earliest empirical evidence.

The significance of such effort is that gender may very well represent an additional dimension in understanding entrepreneurship in transition econ-

omies. In addition, the findings that while women entrepreneurs in transition economies such as Ukraine and Lithuania share many similarities, significant differences exist and confound the convenient assumption that all transition economies are alike. While China, Eastern European countries, and former Soviet republics have all been labeled "transition economies," there are fundamental differences with significant bearings for theory and practice. For instance, a key difference between China and other transition economies since 1970s is the "shock therapy" versus "evolutionary transformation." While reform in other countries has been characterized by a complete replacement of the old system by a new one through a "big bang," the Chinese reform model has been represented by the coexistence and competition of two systems (Tan and Tan, 2005). Such transition process has allowed the country to gradually pass the learning curve and reduce the "human casualties" and consequently opposition to reform (Tan, 2005). Still, the shrinking of the socialist state and the ramifications of wide spread privatization have disproportionately placed a heavier burden on women. Like other communist nations, the Chinese economy revolved around its heavy industry where the majority of men were employed at higher wages. During the transition from communism these industries have been the first to be closed because of inefficiency and/or problems of environmental pollution. Instead, workers are being directed to jobs in the light industries and services, which during communism were largely the domain of women. Now that men are entering the market for these jobs, women are considered less competitive. The possibility of maternity and child-care leave, in addition to frequent absences to tend sick family members, means that women are now viewed as unreliable and expensive compared to their male counterparts. The very laws that once helped women to combine their productive and reproductive roles are now pushing them out of the public sphere.

As new firms struggle to become and remain competitive in a capitalist system, they are forced to shed unproductive workers. Yet despite the fact that China once boasted the highest rates of female labor participation in the world, the force now push women out of the workplace and into the home. Under these new circumstances, women are often

the first to be let go, a situation similar to what was described in the 1996 World Bank Development Report, in which the problem faced by women in transition economies was noted:

Transition affects women much differently in some ways than it does men ... Women are no longer seen as having a social duty to work, but reform has also brought a dramatic decline in affordable child care facilities and a deterioration in health care systems. In addition, economic hardship and uncertainty during transition make it more difficult to feed and clothe the family – responsibilities that have always fallen predominantly to women in these countries... Moreover, women's employment choices may be constrained by increased labor market discrimination, as evidenced by layoffs of women before men and open discrimination in job advertisements (World Bank, 1996).

Indeed, during the process of restructuring the ailing state-owned enterprises (SOEs), many female employees have become the first victim. Very often they were laid off, "bought out," or were forced to retire at the age of 45. Their sources of employment have also changed dramatically from depending on the government to arrange jobs to applying for jobs and seeking employment, or even starting businesses of their own. Furthermore, not only have women in less skilled positions been "displaced," even those more educated women holding professional jobs have found more competitive pressure in professional growth. Shapiro and Sokol (1982) theorize that displacements contribute to individual perceptions of the desirability and feasibility of starting a new business, and such displacements free up the entrepreneurial spirit. How women adapt to such major institutional change, improve their well-being and create value to the society has significant bearing for entrepreneurship scholars, policy makers, and managers. Yet despite the political and economic importance of the Chinese transition economy, Western management theorists have rarely considered relevant issues that have emerged during the transition, leaving most of the discussions to economic analysts and area specialists.

To partially fill such gap, I endeavor to examine women entrepreneurs in Chinese transition economy. Entrepreneurial growth in former centrally planned economies undergoing transition toward market driven economies, such as the People's

Republic China, has attracted increasing attention due to the importance of entrepreneurial firms who have become customers, suppliers, competitors, and strategic alliance partners of multinational corporations, whether they are owned and led by men or women. In addition to such economic significance, an improved understanding of entrepreneurs in Chinese transition economy can also answer critical questions arising from other transition economies in former Soviet republics and Eastern European countries due to their similar historical path from socialist command economies.

Previous studies examining entrepreneurship in Chinese societies reveal a common feature: self-employment is at a premium. As Wong (1988) reported in his cross-national comparative study of Chinese entrepreneurs, someone not able to make himself a business owner is considered a failure, a "good-for-nothing." The motivation for achievement and independence has prompted overseas Chinese to set up their own business. After three decades of socialist central planning that depressed private entrepreneurship, the economic reform in late 1970s released the entrepreneurial spirit and led to the boom of private entrepreneurship. Such environment under continuous and uninterrupted transformation offers a unique setting to test existing entrepreneurial theories and to build new ones.

After China adopted the policy of reform and opening-up, the planned economic system has been giving way to market economic system. With the forming of a market-oriented employment system, women's concepts about employment have undergone great changes. The employment security guaranteed under central planning has been shattered. Statistics from the Second Sampling Survey on Chinese Women's Social Status¹ indicate that in 2000, 43.3% of urban women obtained employment through the arrangements of local labor and personnel departments, 15.1% less than in 1990. Some 21.4% of urban women started their own business, 17.1% higher than in 1990, and very close to the 21.7% of men. The number of women engaged in the nonstate owned economy has also been growing fast. Since 1995, the number of women involved in private economy has risen by 60%, reaching nearly 10 million. To date, women entrepreneurs make up 20% of the total Chinese entrepreneurial population.

Women entrepreneur associations have nearly 10,000 members. In 63% of enterprises run by women entrepreneurs, female employees make up more than half of the total employees. In short, women's business ventures create opportunities for women's employment.

Despite the longtime influence of socialistic ideology that seems in contradiction with the idea of private enterprise, a paradox exists in that the Chinese have been entrepreneurial throughout their history. The Chinese are extremely hardworking and given their collectivist inclination, have demonstrated a strong commitment to family-based ventures (Lee and Peterson, 2000). Moreover, as political and economic change continues in China, the Chinese people, especially the younger generation, are developing an entrepreneurial spirit characterized by innovative thinking, modernization, and individualism. Workers are coming to expect more freedom and change, thus weakening their uncertainty avoidance. Although the government still retains too much control over all business ventures, privatization has led to decision making becoming much more decentralized, which in turn had led to employees who are beginning to enjoy a taste of autonomy and are becoming more motivated by money and individual rewards. As is the case with Japan, as China's economic, political, and cultural systems continue to evolve and/or change, the nation's future in entrepreneurship looks promising.

While the term "entrepreneurship" originated from capitalist context, for the purpose of this study, it would make sense to conceive of the entrepreneur as an individual who is opportunistic, proactive, action oriented, value-driven, riskaccepting, whose creative ideas take the form of organizational birth, growth, and transformation (Tan, 1996). Chinese women first entered private enterprises in an area hard-line Communists found it difficult to oppose – they were "replaced" from labor force during economic reform. Refusing to fall into victim, these women took control of their destiny and started to create employment opportunities for themselves. Political leaders, fearing social unrest, knew change was urgently required in order to place the replaced workers. Allowing them to set up individual enterprises to sell daily necessities, repair goods, and serve drinks and fast foods seemed, even to many who opposed economic reform, a

solution to the problem. By 1980, it was official policy that the monopoly of state enterprises had ended. For these women who were economically "displaced," entrepreneurial venture seemed to be a desirable alternative. Considering the difference in institutional environments that women have to face, the following relationship is hypothesized:

H₁: Under Chinese transitional environment, men and women entrepreneurs will exhibit significant difference in decision characteristics.

The ultimate objective of an entrepreneurial venture is about competing and winning. We are interested in entrepreneurial strategies because of their impact on firm performance. The structure-conduct-performance paradigm argues that certain strategies are more effective than others in response to environmental mandate, and such strategic choices will have significant impact on performance. Following this line of logic and the reasoning presented in *H₁*, that women are likely to exhibit different entrepreneurial orientations, we would expect that the entrepreneurial ventures owned and managed by women will differ in their performance than those by men. Under such circumstance, I suggest the following:

H₂: Under Chinese transitional environment, entrepreneurial firms owned and managed by men and women will exhibit significant difference in performance.

While I endeavor to propose a set of specific relationships for empirical testing, it should be noted that, as shown in literature review, theory on women entrepreneurship so far offer only scattered and inconsistent predictions, and empirical evidence have been largely inconclusive. Furthermore, to what extent this information may help explain strategy and performance of women entrepreneurs in Chinese transition economy remains a question mark. Motivated by a deep curiosity on "what is going on behind the bamboo curtain," and rooted in a strong conviction that answer to such question has significant implications for theory and practice, I set out to collect and examine empirical evidence in China, an environment undergoing profound institutional transformation.

Research design and data collection

Previous studies of women entrepreneurs have focused mostly on traditional industries due to less demanding requirements on education, prior working experience, technology and management training, and most importantly, financing. As shown in the literature, the main finding of difference that is somewhat consistent in previous studies is that women’s businesses are concentrated in the retail and service sectors and, because of this, women entrepreneurs have exhibited weaker preference for growth, which subsequently results in less opportunity in getting financing. What has been largely missing in the study of women entrepreneurs is their decision characteristics and performance in technology driven industries. Whether those findings would hold in more technology driven industries is not clear.

In an effort to address such missing link, I have decided to focus on women entrepreneurs in non-traditional industries that are mainly dominated by men. Since drawing sample from a single industry provides “natural controls” of confounding factors (Peteraf and Shanley, 1997: 183), I focus on one particular industry in China, the electronics industry. In early years of economic reform, as part of the “incremental model,” the Chinese leaders selected certain industries to test their reform measures before such measures were implemented nationwide. Electronics industry was among the first to become marketized in order to address the shortage of consumer products and to import foreign investment and technology. As a result, such industry represents an appropriate industry context for my analysis, since it has become one of the most competitive industries in China (Tan and Litschert, 1994). Such research setting thus offers unique opportunity to test existing theories and to build new ones.

I started the research by reviewing public information and government archive, and interviewed private entrepreneurs in China, both women and men, to build understanding of the issues in order to design the research, including the questionnaire. The following are brief descriptions of measurement of the constructs, data collection, as well as how the research addressed validity and reliability issues.

Measurement

Sometime ago, Venkatraman outlined several salient dimensions of entrepreneurial orientations consisting of futurity, innovativeness, risk taking, proactiveness, and competitive aggressiveness (1989). Entrepreneurial orientation is different from entrepreneurship itself and serves as a mediator of the relationship between external environment and entrepreneurship. Although entrepreneurship simply refers to new entry, a firm’s entrepreneurial orientation refers to the entrepreneurial process, namely how entrepreneurship is undertaken—the methods, practices, and decision-making styles used to act entrepreneurially. Specifically, those entrepreneurs are willing to commit to future growth (futurity), encourage experimentation (innovativeness), take risks, take initiative (proactiveness), and aggressively compete within their markets have a strong entrepreneurial orientation, whereas those lacking some or all of these have a weaker entrepreneurial orientation. The theory behind entrepreneurial orientation offers predictive power, and certain entrepreneurial orientations are critical for the survival not only to firm behavior, but also to the process of entrepreneurial development (Lee and Peterson, 2000).

In this study, I took a multi-dimensional approach and devised a set of questions to probe the following features of entrepreneurial orientations found in literature (Venkatraman, 1989; Tan and Litschert, 1994).

Innovativeness: Innovation plays a large role in the presence or absence of entrepreneurship. Highly innovative entrepreneurs will likely experience positive results in terms of new technologies, products, services, or processes within their respective countries. I included one question to probe this dimension.

Proactiveness: Another dimension of entrepreneurial orientation is proactiveness. More proactive entrepreneurs pursue and anticipate opportunities and participate in new or emerging markets in order to gain competitive edge, and they tend to act quickly. Proactive individuals do what is necessary to bring their concepts to fruition and gain an advantage by being the first to capitalize on new opportunities. I included one question to probe this dimension.

Aggressiveness: The competitive aggressiveness dimension of entrepreneurial orientation refers to

entrepreneur's propensity to challenging competitors or improving their position relative to other firms. This is an important component of entrepreneurial orientation because new ventures are much more likely to fail than established businesses. Thus, an aggressive stance and intense competition are critical to the survival and success of new start-ups. I included one question to probe this dimension.

Futurity: A defining characteristic of entrepreneurial firm is its growth orientation. Noting the trade-off between short-term profit and long-term growth, the futurity dimension measures whether the firm is oriented towards its long-term competitive position, rather than short-term gains. A future oriented firm intends to be effective and explicitly relates its strategic decisions to long-term goals and future environmental changes. I included three questions to probe different aspects of futurity dimension.

Riskiness: Perhaps one of the most widely cited descriptions of entrepreneurs or entrepreneurship is the willingness to assume risk. Individuals who are willing to accept the uncertainty and riskiness associated with being self-employed as opposed to settling for the refuge of jobs within organizations are often considered being entrepreneurs. Furthermore, risk taking requires the entrepreneur to be prepared to make resource commitment to projects with high risks and returns, instead of those with moderate risks and returns. Thus, risk taking is an important component of a strong entrepreneurial orientation. I included three questions to probe different aspects of riskiness dimension.

These dimensions of entrepreneurial orientation offer fine-tuned measurement, yet, maintain reasonable level of parsimony and are therefore deemed appropriate for this research. The questions followed a seven-point scale (1 being the least willing to make decisions with certain characteristics). They are listed in Table I.

Performance. Instead of directly asking for sensitive financial performance information, I asked respondents to report their firms' relative performance compared to their close competitors in the following areas: (1) *after-tax return on assets*; (2) *after-tax return on sales*; and (3) *sales growth* within the industry. These questions followed a five-point scale, ranging from top 20% to bottom 20% (1 being the worst performance). This method was chosen not only because accounting and financial data were not publicly

available, but also due to some respondents' reluctance to report their real performance. Since competitive performance is a relative construct (Porter, 1980) and the focus of this research was on entrepreneurs' cognitive identification of entrepreneurial actions, this method of obtaining relative performance information based on the entrepreneurs' judgment was deemed appropriate. After all, it is the respondents' perception which is brought into the strategic decision process (Bogner and Thomas, 1995).

Gender difference. To alleviate respondents' concern for privacy, I kept firm and individual information to the minimum. I did ask the respondents to identify their gender. I used this information to compare women and men by creating a dummy variable.

Validity and reliability issues

Informed by my extensive fieldwork, the questionnaire was first subjected to back-translation procedures to ensure accuracy and was then pre-tested for face and construct validity. Previous research suggested that in the absence of archival data, self-reported measures are acceptable and are often equally reliable, provided that data reliability is examined (Nath and Gruca, 1997). To triangulate the data, respondents who voluntarily revealed their identity were interviewed. The information collected exhibited a high level of consistency with questionnaire responses. I left the survey participants unidentified in order to minimize distorted potential tendency to paint a "rosy" picture. Previous research found that under anonymity, Chinese executives were more willing to provide accurate information (Tan and Listchert, 1994).

Through a mailed survey, I collected a random sample of 53 small enterprises (with no government or foreign capital) in Chinese electronics industry, among which 18 were owned by women. A women entrepreneur can be defined as "a woman who has initiated a business, is actively involved in management, owns 50% of the firm, and has been in operation for one year or longer" (Moore and Butler, 1997: 13). My sample was consistent with such definition.

I tested data reliability by using Cronbach's alpha. Generally a value above 0.7 is considered adequate

TABLE I
Comparisons between men and women entrepreneurs

Variables	Groups	N	Mean	F	p ≤
EO1. In making strategic decisions, we look into the future to anticipate changes	Men	35	4.26	0.03	0.86
	Women	18	4.22		
	Total	53	4.25		
EO2. We are willing to sacrifice short-term profitability for long-term goals	Men	35	4.11	0.06	0.80
	Women	18	4.17		
	Total	53	4.13		
EO3. We emphasize investments that will provide us with a future competitive edge	Men	35	4.14	0.51	0.48
	Women	18	4.00		
	Total	53	4.09		
EO4. In making strategic decisions, we constantly seek to introduce new brands or new products in the market	Men	35	4.43	3.50	0.07
	Women	18	5.00		
	Total	53	4.62		
EO5. Whenever there is ambiguity in government regulation, we will move proactively to try to take a lead	Men	35	4.51	3.62	0.06
	Women	18	5.17		
	Total	53	4.74		
EO6. In making strategic decisions, we respond to signals of opportunities quickly	Men	35	4.80	0.93	0.34
	Women	18	5.06		
	Total	53	4.89		
EO7. In making strategic decisions, we tend to focus on investments that have high risk and high return	Men	35	4.74	4.02	0.05
	Women	18	5.39		
	Total	53	4.96		
EO8. We search for big opportunities, and favor large, bold decisions despite the uncertainty of their outcomes	Men	35	4.54	5.49	0.02
	Women	18	5.50		
	Total	53	4.87		
EO9. We approve new projects with 'blanket' approval rather than on a 'stage-by-stage' basis	Men	35	4.40	5.17	0.03
	Women	18	5.17		
	Total	53	4.66		
After-tax return on total assets (ROA)	Men	35	2.31	15.49	0.00
	Women	18	3.44		
	Total	53	2.70		
P2. After-tax return on total sales (ROS)	Men	35	2.29	17.86	0.00
	Women	18	3.44		
	Total	53	2.68		
P3. Firm total sales growth (GROWTH)	Men	35	2.37	7.25	0.01
	Women	18	3.06		
	Total	53	2.60		

for internal consistency and benchmark was met. The validity of the assumption of normality was tested using two basic approaches: (1) the Shapiro–Wilk W test and (2) the Kendall and Stuart’s rule of thumb using skewness and kurtosis. Results indicated that the normality assumption appears to be valid when applied to the data at hand. Multicollinearity was

diagnosed by examining the variance inflation factors (VIFs) for the predictors. The VIF values for the predictors, all substantially lower than the rule-of-thumb cutoff of 10 (Neter et al., 1991), revealed that multicollinearity is not a problem in this study.

To ensure correspondence between survey results and the dynamic process of entrepreneurial decision

making among women entrepreneurs, I undertook intensive interviews before and after the survey. Insights gained from such case studies are reported following data analyses to triangulate quantitative results.

Results from data analyses

In this study, my first concern was to determine if women and men are different in their strategic orientations and venture performance. To this end, I used Analyses of Variance (ANOVA) to compare and contrast the two subsets. The results are presented in Table I. As can be seen, women and men entrepreneurs did not differ significantly in their most of entrepreneurial orientations except propensity toward risk taking. In this regard, women were more prepared to take risks than men. More specifically, women entrepreneurs were more willing to accept higher risks for higher return, and pursued greater opportunities despite high uncertainty. Furthermore, they were also more likely to make major strategic moves as opposed to incremental changes which is less risky otherwise.

In terms of venture performance, women entrepreneurs reported higher return on assets (ROA),

higher return on sales (ROS), and higher sales growth than their male counterparts. Such differences were all statistically significant that would offer counter evidence to the “female underperformance” argument.

To test the second hypothesis about venture performance, I used multiple regressions. Results of regression analyses are presented in Table II. For the group as a whole, willingness to sacrifice short-term benefits for long-term growth was negatively associated with returns on assets (-0.38). On the other hand, the emphasis on investing for future competitive advantage was positively associated with performance (0.34). It appears that under the current environment in China, investing for future competitive advantage is rewarded, but not if it has to compromise short-term return. In addition, the willingness to take bold strategic moves has also led to improved return on assets (0.653). The most interesting result was that women as a whole have received better return than men.

Next, I regressed independent variables on return on sales. The results were similar. While building long-term competitive advantage has been rewarded by market (0.33), such benefits may be overwhelmed by short-term interest if it is compromised, as can be seen from the negative effect (-0.42). As the case in ROA, the willingness to make major

TABLE II
Regression analyses of venture performance

	ROA			ROS			Growth		
	β	T	$p \leq$	β	T	$p \leq$	β	T	$p \leq$
(Constant)		-0.22	0.83		0.09	0.93		0.66	0.51
EO1	0.05	0.28	0.78	-0.01	-0.03	0.98	0.11	0.62	0.54
EO2	-0.38	-2.59	0.01	-0.42	-3.15	0.00	0.04	0.27	0.78
EO3	0.34	2.57	0.01	0.33	2.83	0.01	-0.32	-2.29	0.02
EO4	-0.21	-1.09	0.28	-0.07	-0.45	0.66	0.09	0.44	0.66
EO5	-0.44	-1.07	0.29	-0.29	-0.79	0.43	-0.59	-1.35	0.18
EO6	-0.06	-0.29	0.77	-0.01	-0.03	0.97	0.53	2.55	0.01
EO7	0.33	1.47	0.15	0.21	1.03	0.31	-0.24	-1.02	0.31
EO8	0.37	1.07	0.29	0.37	1.20	0.24	0.68	1.86	0.07
EO9	0.65	2.54	0.02	0.51	2.21	0.03	0.23	0.84	0.41
Woman	0.30	3.10	0.00	0.33	3.70	0.00	0.16	1.59	0.12
R^2	0.67			0.68			0.63		
F	8.68			11.62			7.16		
$p \leq$	0.00			0.00			0.00		

Note: All β coefficients are standardized.

strategic moves (which often requires major resource commitment) is also positively related to performance (0.51). Once again, women entrepreneurs had better performance than men (0.32).

Finally, I tested the impact of entrepreneurial orientations on sales growth, a measure of market growth rather than profitability. The results were remarkably different from previous two tests. Specifically, the willingness to invest for future competitive advantage was negatively related to sales growth (-0.32). On the other hand, the level of competitive aggressiveness was positively associated with performance measured by sales growth (0.53). Unlike the previous two tests, women had no performance advantage over men in this case. While they had a slight positive advantage (0.16), it was not statistically significant. In all three tests, the regression equations were statistically significant ($F = 8.68, 11.62, \text{ and } 7.16$, respectively).

In sum, the primary concern of this study was to examine if women entrepreneurs differed significantly from their male counterparts, and if such differences have led to improved performance. With regard to the first hypothesis suggesting that men and women differ in entrepreneurial orientations, I found mixed evidence. Overall, I found that men and women share many entrepreneurial orientations such as futurity, proactiveness, aggressiveness, and innovativeness. On the other hand, I also found significant evidence that women indeed differ in some dimensions of entrepreneurial orientations, mostly in their higher propensity to take risks than men. More importantly, women entrepreneurs surveyed in this study have reported higher performance than their male counterparts. The study thus presents more consistent evidence that venture businesses owned and managed by women exhibited better performance.

Previously Reynold et al. (2002) suggested that women are influenced by the same factors that affect how men make entrepreneurial decisions. As a report on American entrepreneurs from Global Entrepreneurship Monitor (Minniti and Bygrave, 2003) demonstrates, men are more likely than women to make larger investments, which is more risky. However, result from this study that women entrepreneurs are more willing to take risks than men is slightly intriguing. In the discussions that follow, I introduce additional evidence from case

study to validate quantitative results and put them in perspective.

Qualitative evidence from case study

While the hypotheses testing were based on survey data and statistical analyses, the study was grounded in substantial qualitative antecedents. I initiated the research with extensive field-based case studies. When I compare the results with my interview notes, it is clear the two sources share high level of correspondence. I present two cases that I have followed up over the years to triangulate the results from data analyses.

Case One is a company started by a woman in late 1980s. Before starting her own venture, she and her husband worked in the R&D unit of a leading state owned enterprise (SOE) that produced black appliances (television sets, cassette players, radios, etc.) and other communications equipments. She graduated with engineering degree from a leading university in mid-1980s and obtained MBA degree recently. After years of successful career, she realized it was very difficult for her to grow professionally due to the "glass ceiling." Many of her male colleagues have been offered increasing level of responsibility. The best example she shared with us was that she remained an engineer while her husband has been promoted the vice president of the company. The unspoken rationale, with all the good intension was that it was in the best interest of her, her husband, and the company that she kept a less demanding job so she could take care of the family and support her husband's increasing responsibility and more frequent travel. As much as she wanted to support her husband and raise family, she felt increasingly frustrated and resigned to start her own company. With extensive network among classmates and friends, and with the help of her husband, it was not too hard to get financing and premier locations, as well as initial orders. In fact her largest customer has been her former (and her husband's current) employer, she has been its outsourcer to produce products for export under that company's brand. When asked her secret of success, she attributes to her previous work experience in the industry, network of friends, and a supportive husband. Without having spend too much on R&D and marketing

expenses, her company has considerably higher-profit margin than in the unit that produces the same products in the SOE. She tells us that it is not common for her competitors to have this level of social capital and connections. On the other hand, her primary frustration has been competing needs between running her business and taking care of her family. She shared the following account:

I feel I have the talent and ambition to create a successful company, but deep in my heart I am a traditional woman. I want to be a good wife to my husband, good mother to my son, and a good daughter to my parents. I would have liked to spend more time with my son and help him with homework and attend his activities. But I rarely have time to do so. I once thought after the company is in stable growth path, I can hire managers to run daily operations, but I am not satisfied with their decisions. Fortunately my parents have been very supportive to me and shared most of my duties at home.

When I first started this company, I just wanted to test my capabilities and I measured my success with profits. I have proven myself and made enough money now. Very often I want to take the money and buy a house in North America so I can enjoy life and focus on my son's education. However I find it more difficult to quit now. Our employees depend on the company, and the young people need opportunities to grow. They took risks to join me when I struggled for survival. The more we grow, the more obligations I have to my customers, suppliers, and especially my employees. I must take care of them. I want to create opportunities for them.

Today, her strategy is to become part of the global supply chain of multinational corporations and target export market. Her company now makes DVD players using the brand name of a leading Chinese appliance manufacturer, DVD-ROM for major computer manufacturers, and other consumer electronics products. Her next goal is to eventually build her own brand.

Case Two was also started by a woman with college trainings in one of the best universities in electronic science and technology. In the 1980s she worked in a research institute under the Chinese Navy. Life was easy and stable, but soon she felt she needed more challenge in order to grow professionally. Furthermore when she saw the private

entrepreneurs with very little formal education were making considerably more money, she felt her talent was wasted. When the Navy started to install entertainment equipments in its ships, she and her husband, also an electronic engineer, saw a unique opportunity and signed a contract to start a company affiliated with their research institute. She would continue to draw salary and benefits, and had access to much of the institute's intellectual capital. In exchange they would share profits with the institute. With connections in the Navy, they were awarded the contract to install close circuit TV sets in navy ships. The company then developed other related businesses serving civilian sectors and experienced rapid growth. When the central government started to curtail business connections with military, their company was officially span off from the research institute. That was a tough time for them, but soon video compact disc (VCD) player became popular in China. They quickly leveraged line of credit and new orders from the military. The VCD popularity allowed her company to maintain cash flow and build independent research capabilities. At the same time, her husband has become a strategic investor of a major university's research laboratory (also under the jurisdiction of the military) and facilitated the transfer of several key patents at very favorable terms. She has now owned multiple patents and becomes a major competitor with leading multinational corporations to offer communication solutions to Chinese railroad sector. When asked about her reflections, she told us the following:

It is very tough for a woman to be a business owner, especially in high-tech sectors. Most of my competitors are men, and they do not take me seriously. They often have doubt whether a woman can deliver high quality solutions, although I am far more familiar with the technology than many of them. They are more interested in dancing rather than doing business with me. Very often, I need to ask my husband to negotiate major contracts and deal with government officials. Another problem that I find very annoying is much of the business discussions are conducted over dinner tables and in entertainment facilities. Sometimes I find it quite offensive when men start to talk dirty jokes and engage in other entertainment activities. I often send my marketing staffs to entertain clients and avoid such social activities. It has cost me some opportunities but I do not regret. I have made enough money to live

comfortably for rest of my life, and I am not willing to alter my life style or compromise my principle.

It is apparent that women entrepreneurs in Chinese high-technology sector exhibit some unique characteristics not found in most of the existing studies set in more traditional industries. For instance, contrary to previous findings that the biggest challenge for women entrepreneurs was financing the venture, the women entrepreneurs in my sample did not report that as primary concern. That may be explained in part by the fact that these women had higher education, considerable working experience and extensive professional network. They understand the technology trend just as much as their male competitors. More importantly, they seem to share one common characteristic, most of them are married to a supportive husband who is equally well connected to extensive social network. In a significant number of cases, the husband holds-high position in a SOE, which would indicate that he can offer certain level of security for the family even when the wife's venture suffers from setback. With this level of security, the wife can afford to make bold moves and take more risks. They are more likely to pursue long term growth and invest for future competitive advantage. During my interviews, I heard from a number of women entrepreneurs, with slightly different descriptions, that they did not start and grow the venture business to make "grocery money." That need has been taken care of by the husband. They are making money to pay for bigger houses, nicer cars, or their children's education. Along the way, as the venture business grows, they assume greater responsibility to a broader range of stakeholders such as employees and customers. Such transition from "taking care of myself" to "taking care of others as well" appears to validate the notion that women entrepreneurs may develop a more holistic vision and "integrate" their business into their lives (Brush, 1992).

It should also recognized that family support is also extended from parents, who not only provide backup in taking care of child, but also offer the psychological support and comfort. Such findings are consistent with what Siu and Chu (1994) reported in their study of women entrepreneurs in Hong Kong. Findings from this study point to an important feature of Chinese entrepreneurship: in the absence of well established institutional environment that

supports women entrepreneurs, family offers a reliable supportive system that significantly improves the woman entrepreneur's capability to endure hardship and uncertainty. They provide added network resources to secure funding, technical assistance, and business connections, but more importantly, they offer the assurance to the women entrepreneurs that they are "doing the right thing," even when the plans did not work out perfectly.

Previous studies have hypothesized family support to be of special significance for women entrepreneurs, either as an obstacle or as a resource (Caputo and Dolinsky, 1998; Cox et al., 1984; Dumas, 1992; Holmquist and Sundin, 1990; Marshack, 1994; Nelson, 1987). Such hypothesis has certainly received some support from the experience of the women entrepreneurs in my study. As Gannon (1994) suggests, the Chinese believe that family is the basic fabric of society and the benefit extends beyond family boundary. Such support system clearly has led to improved chance for success, as evidenced by findings from this study. While family support has always been a major help to male entrepreneurs, such support takes more significant and special meaning to women, since they have been traditionally on the giving rather than the receiving end. In addition, such support system offers expanded social capital, a critical factor for small business life (Spence et al., 2003).

It should also be noted that the experience of women entrepreneurs in this study reveals another interesting phenomenon. They left their stable corporate jobs due to "push" elements such as the "glass ceiling" phenomenon that prevents women from rising above a certain organizational level (Daily et al., 1999; Sing et al., 2002). Thus, starting their own businesses enables women to use, satisfy, and maintain high levels of skill, as they could not when working for a corporation (Alvarez and Meyer, 1998). In this context, the Chinese women entrepreneurs share with their counterparts in other transition economies such as Lithuania (Welter et al., 2003), in that even in more advanced transition economies, women are still driven by the "necessity" and push factors. But they were also driven by "pull" elements such as being the decision maker, self-actualization, financial benefits, the desire to achieve a more comfortable balance between family and work responsibilities, and capitalizing on

network resources and opportunities that the women and their husbands had access to. In this sense, the Chinese women entrepreneurs in high-tech industries share some resemblance with their counterparts in the US that the higher the income, the more likely that they will pursue “opportunity driven” rather than “necessity driven” ventures, as reported by Global Entrepreneurship Monitor (Minniti and Bygrave, 2003). They are willing to take higher risks and pursue growth, the characteristics that set them apart from women entrepreneurs in traditional and low-growth industries (Gundry and Welsch, 2001)

Conclusion and implications for future research

In this study, guided by insights from existing studies on women in entrepreneurship, inspired by the conviction that entrepreneurship is the best way to empower women, and motivated by a deep curiosity on how Chinese women entrepreneurs make strategic decisions aimed at firm growth rather than satisfying state planners, I undertook the first empirical study of women in Chinese electronics industry, to the best of my knowledge. I attempt to learn some lessons from women entrepreneurs that may shed new light on the study of entrepreneurship.

At the core of the existing literature on women in entrepreneurship is the assumption that women are generally vulnerable with limited opportunities and resources, and that ambitions to found a business venture stem from a lack of alternatives. In addition, women entrepreneurs are stereotyped as small enterprises that tend to occupy mainly traditional business sectors dominated by women, and only seldom do they pursue growth in technology-driven industries previously dominated by men, and they tend to have weaker preference for growth and expansion. The results from my data analyses as well as case studies to some extent contradict previous findings in that women entrepreneurs in Chinese electronics industry prefer more bold and risky strategic moves than their male counterparts. They are very much growth oriented just like their male counterparts in the same technology driven industries. Such orientation, revealed by statistical findings

as well as case study, would indicate that women entrepreneurs can be driven by opportunities rather than just necessity. This is a departure from findings from a large scale global study of entrepreneurs from 27 countries, which reports that men are more likely than women to pursue opportunity entrepreneurship, while women are more likely to pursue necessity entrepreneurship (Reynold et al., 2002). I believe such difference may result from the research setting. My sample is not representative of “average” entrepreneurs, Chinese or otherwise. In another report from the Global Entrepreneurship Monitor, the research team found that 5.6% of Chinese entrepreneurs started venture business to pursue opportunities presented to them, while 7% did so due to necessity (Chu et al., 2002). The women represented in this study are clearly better educated, and with more professional working experience, started their venture businesses in nontraditional industries. They are more similar to those American women entrepreneurs who have passed the stage for survival and transitioned toward growth-oriented ventures (Brush and Hisrich, 1991; Gundry and Welsch, 2001). On the other hand, the individuals I interviewed had considerable experience in the industry they founded business ventures, contrary to those reported by Gundry and Welsch (2001). In light of evidence reported in this study, I have reason to believe that “the profile of women entrepreneurs in the future will continue to match their changing situation, and move even closer to that of male colleagues” (Birley, 1989: 37). To draw more definitive conclusions, however, such optimism should be empirically tested and validated in future studies.

In light of findings reported in this paper, I consider that the focus in the existing literature on the women owned/managed enterprises specialized in traditional sectors and facing certain challenges, and on why and how they are founded and how the women entrepreneurs make strategic decisions, is useful but somewhat limited. While many business ventures founded by women focus on specialized niches and exhibit certain decision characteristics, such observations should not be over-generalized and stereotypical. The question that I raise, then, is “what are the contributing factors to the women entrepreneurs who do not fit the traditional profiles?” How well does the literature explain such

issues will be new challenges for entrepreneurship theory and practice.

While such insights are a valuable addition to the literature since I investigate a context largely overlooked in most studies of women entrepreneurs, the readers should be reminded of the uniqueness when interpreting the findings and generalizing to different settings. Many of the women entrepreneurs I studied had formal education, professional work experience and network, and a supportive husband who was also highly educated and well connected. Future research on women entrepreneurs may compare and contrast with those in traditional industries in order to gain fine-tuned insights on entrepreneurial orientations and venture performance. In addition, future research should investigate the influence of entrepreneurship on women's families and greater communities in which they live and work, and how such influence differs in different industries and countries around the world. Furthermore, future research opportunities exist to address how risk taking and performance relate to the industry and countrywomen entrepreneurs found and operate venture businesses. Collectively, will women be less willing to take risk and pursue growth if they enter traditional industry, without formal education, work experience, network, supportive family, and a husband who has secure income and access to social capital? Such questions should inspire more interest in a wide range of issues about women in entrepreneurship. Finally, it should be noted as well that my sample size is modest, which should be kept in mind when generalizing to other contexts. In this study, I focused on the quality of respondents by "escalating the unit of analysis" (Podsakoff and Organ, 1986). Specifically, I sent questionnaires only to the owner/manager in each firm, instead of to multiple respondents. Such choice is consistent with our research objective. Nevertheless, future research based on larger samples is needed in order to draw definitive conclusions.

In conclusion, emerging economies such as China raise issues for theory development, concerning the extent to which concepts such as entrepreneurial orientations originated from the West can be applied, extended, and modified. This research effort has illustrated how entrepreneurial orientation and venture performance, an issue often overlooked in existing entrepreneurship research in the West,

functions as important tools to understand women entrepreneurs in a Chinese technology driven industry, thus enriching the theoretical discussion on entrepreneurship in general and women in entrepreneurship in particular. At the same time, this article also adds to our empirical knowledge about competitive dynamics in an emerging economy, by uncovering the strategic decision characteristics and venture performance in an industry that had exhibited little discernible entrepreneurship and strategies until two decades ago. The study concludes by raising more research questions than it answers. But, as noted by Walsh and Kosnik, "one of the hallmarks of provocative research is that it generates more questions for continued research than it answers." (1993: 692). In the case of this study, the discovery of an empirical "anomaly," namely, women entrepreneurship in nontraditional industries, calls for more in-depth examination of the competitive dynamics during economic transitions. Historically, anomalies have been launch pads for scientific progress (Kuhn, 1970). Researchers may make larger contributions by focusing on these anomalies in transition economies, since currently we know very little about the competitive dynamics there. An improved understanding of entrepreneurship and firm growth has to take the experience of so many entrepreneurs, men and women, in these transition economies into consideration.

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Notes

¹ <http://www.womenofchina.com.cn/> (2004-9-2).

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