Gender, innovation and the growth of small medium enterprises: An empirical analysis of Vietnam's manufacturing firms

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Abstract. This paper focuses on analysing relationships between gender, innovation and the growth of manufacturing SMEs in Vietnam. The analysis is based on the conceptual framework outlined by Storey (1994). We used a sample of 353 SMEs derived from secondary dataset from the World Bank. Our results indicate that gender, new product introduction strategy, firm size and firm age are significant factors that influence the growth of SME manufacturing. Several implications for SMEs, the government sector and researchers as well as future research direction are also provided.

Keywords: Gender, innovation, growth, SMEs, Vietnam.

1. Introduction

Since Vietnam's economic reform program known as the "*doi moi*" or "*renovation*" was launched in 1986, the Vietnamese economy has developed and is one of the most rapidly growing economies among Southeast Asian countries. In the development of Vietnam's economy, small and medium-sized enterprises (SMEs) have emerged as a dynamic force. SMEs, especially manufacturing SMEs, make a great contribution to creating employment and income in Vietnam (Rand et al., 2002; Berry, 2002). The manufacturing SMEs sector accounts for 20.9% of the total number of SMEs in Vietnam in 2004 (GSO, 2005), which makes manufacturing the second largest of the

SMEs after Trading. Manufacturing SMEs are the most important sector for the industrialization and modernization strategy of the Vietnamese economy.

The potential and significance of the manufacturing SME sector stand however, in marked contrast to the lack of detailed understanding of the characteristics and factors behind firm growth in this rapidly growing East-Asian economy (Rand et al., 2002). A number of researches into SMEs have been made, but most of them only focused on general descriptions of the current situation of the SMEs sector. Research on the underlying characteristics of manufacturing SMEs is still limited, especially on factors affecting the success, growth, and profitability of these SMEs.

Therefore, in order to explain the dynamics of the manufacturing SMEs in Vietnam, this

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paper focuses on analysing the relationships between gender, innovation and the growth of SMEs in Vietnam. The purpose of the paper is to investigate whether gender and innovation (focused factors) contribute to the growth of manufacturing SMEs in Vietnam.

This paper uses data from the Productivity and Investment Climate Enterprise Survey implemented by the World Bank in 2005. The sample includes manufacturing SMEs in five regions of Vietnam.

The paper is organised as follows: the first section (above) briefly reviews the literature on the growth model of the SMEs sectors and hypotheses development. The third section presents the data and sample as well as the analytical framework, variables and the related measurement. The fourth section presents the models and methods used in the study. The fifth and sixth sections report the results and its discussion and conclusion, respectively.

2. Literature review and hypothesis development

Growth has attracted the interest of many scholars researching SMEs. According to Davidsson et al. (2006) Storey (1994, 2000), studies of small and medium firm growth have so far been many. However, this does not mean that we understand everything about the growth of the small and medium enterprises sector. Moreover, the authors of these reviews have come to realise that it is not easy to make a coherent review from the literature. Each research followed a different direction. The reasons for that are likely due to differences in perspectives and theoretical backgrounds, empirical contexts, model and analysis approaches, and the inherent complexity of the nature of growth itself (Davidsson et al., 2006).

2.1. Growth models

Research studies on firm growth have been numerous and with different perspectives.

Some researchers attempted to categorise the research into specific models. Storey (2000), cited in Curran (1997), noted that there are three models for researching growth: stage models, personality-based models, and descriptive models. Davidsson et al. (2006) did similar work when reviewing research on small firms' growth and suggested two models of growth: "stages and transitions" and "growth antecedents and determinants".

Both Storey (2000) and Davidsson et al. (2006) mentioned stage models that involve the growth processes in the form of life cycle, stage, and/or transition models that consist of the entire life of an organization (see Greiner, 1972, Churchill & Lewis, 1983, Scott & Bruce, 1987). The life cycle model focuses on stages or cycles such as start-up, growth, maturity and decline; whereas the stage model concentrates on the problems the organisation faces during growth (Davidsson et al., 2006) such as growth transition and managerial role problems (Scott & Bruce, 1987). However, these models have limitations as not all firms begin at the first stage of start-up and move to the final stage of decline. In practice, management roles do not move at the same time with their related stage; organisations may have a management style that is more or less advanced than its stage (Storey, 1994).

Models of growth antecedents and determinants actually referred to factors or determinants that affect firm growth, including both indirect and direct effects of the factors. Both the personality-based model and the descriptive model are called "descriptive models" (Curran, 1997). Hence, by nature, descriptive models and models of growth antecedents and determinants are the same, although their names are different. The reason for separating personality-based models from "descriptive models" is to distinguish models based on personality or an entrepreneur's perception with a different analysis method from the other models (Storey, 2000). The origin of personality-based models is developed

by Davidsson (1991). In Davidsson's model, the determinants are *ability, need,* and *opportunity* as well as the entrepreneur's perception of each of these determinants. Based on Swedish data, the authors' findings suggest that all factors affect growth, but *need* variables, with the age of the entrepreneur and the size of the firm being the most effective in explaining variance in growth. The variables also had the most stable effects across industries (Storey, 2000).

The other "descriptive models" were summarised in a framework by Storey (1994) and updated by Barkham et al. (1996). In the framework, a large number of influences on growth are categorised into three groups of factors. These are "*the starting resources of the entrepreneur, the firm, and strategy*" (see Table 1, Figure 1). Growth in small firms is considered to be the result of the direct and indirect influences of three separate but interrelated sets of those factors.

The approach adopted in this study is based on the framework outlined by Storey (1994). Storey's (1994) framework with some modifications was mostly implemented in developed countries. For instance, Barkham et al. (1996) investigated the causes of growth in small manufacturing firms in the UK in 1996. They used OLS regression techniques for analysing only direct effects of firm characteristics, entrepreneur characteristics, business strategy and constraints to growth in turnover. They concluded that it was possible to explain growth in small firms in terms of the four groups of factors. It shows that there is an obvious need for a comprehensive multivariate empirical analysis of small firm growth from which theoretical development may proceed (Barkham et al., 1996), especially in developing countries where there has not been a great deal of empirical research conducted. Theoretically, the growth of Vietnamese SMEs was empirically researched, which focuses only on firm characteristics such as firm size, firm age, ownership structure and location (Hansen et al., 2005).

This study applies a more comprehensive framework modified from Storey (1994) and with a different dataset to show more robust results. This study will focus solely on the direct effects from groups of those factors, especially the effect of gender and innovation on the growth of manufacturing SMEs in Vietnam.
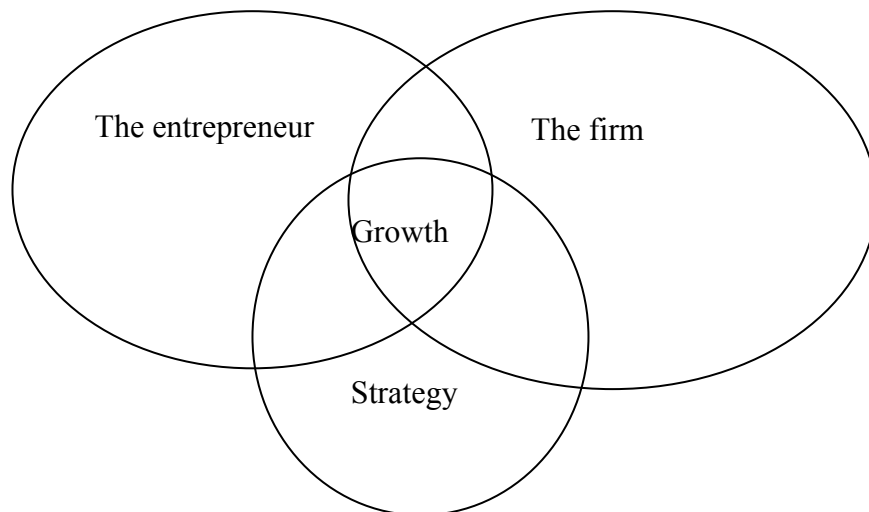

Figure 1: Growth in SMEs.
Source: Storey (1994).

Table 1: Factors influencing growth in small firms

The entrepreneur/resources	The firm	Strategy
1. Motivation	1. Age	1. Workforce training
2. Unemployment	2. Sector	2. Management training
3. Education	3. Legal form	3. External equity
4. Management experience	4. Location	4. Technological sophistication
5. Number of founders	5. Size	5. Market positioning
6. Prior self-employment	6. Ownership	6. Market adjustments
7. Family history		7. Planning
8. Social marginality		8. New products
9. Functional skills		9. Management recruitment
10. Training		10. State support
11. Age		11. Customer concentration
12. Prior business failure		12. Competition
13. Prior sector experience		13. Information and advice
14. Prior firm size experience		14. Exporting
15. Gender		

Source: Storey (1994).

2.2. Conceptual framework

Figure 2 shows the conceptual framework used in this study. The design of this framework is based on the theoretical discussion, the previous studies and the framework of Storey (1994). Figure 2 illustrates a set of factors affecting the growth of the firm. These factors are business strategy, owner/manager characteristics and firm characteristics.
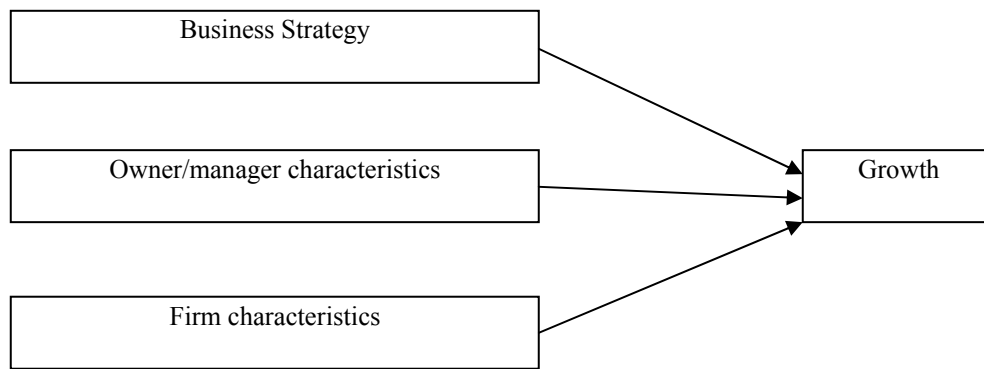

Figure 2: Conceptual Framework.
Source: Researcher's design based on the descriptive model outlined by Storey (1994).

2.3. Factors affecting firm growth

As discussed in his framework of firm growth, Storey (1994) provides an overview of many factors considered empirically by researchers and suggests a framework that includes three groups contributing to growth. In these three groups, Storey concludes there are thirteen significant factors affecting the growth of a firm: motivation, education, management experience, firm age, size, industry sector, legal form, location, ownership, external equity, market positioning, technological sophistication and introduction of new products.

In the following section, Storey's framework is used as a base to develop the hypotheses used in this study.

Business Strategy

New Product Introduction

Storey (1994) pointed out that there are three elements regarding central strategic issues for the growth of SMEs. They are technological sophistication, market positioning and new product introduction. The strategy of new product introduction is only an indicator of technological sophistication or innovation of the firms. However, this specific indicator is one that researchers have usually considered as an independent variable. The term "new product" has two meanings. One is a product totally newly produced. The other is just the making of some changes in existing products. However, the important point to note is what the market share of that new product is. Storey (1994) summarised eight studies that have specifically investigated this indicator, five of which showed that SMEs who introduce new products are likely to grow more rapidly than SMEs who do not introduce new products. The other three studies do not indicate a significant impact on the firm performance. Therefore, the general pattern is that more rapidly growing SMEs are likely to have made new product introduction. The following relationship is hypothesized:

H1: Strategy of new product introduction is positively and significantly associated with the growth of the firm.

Firm Characteristics

Size of Firm

We can say without hesitation that the size of a firm is the most widely studied factor for its contribution to the growth of a firm because of the widespread interest in the issue of job creation (Davidsson, 2002). Evan (1987), Hall (1987), Wagner (1995), Almus and Nerlinger (1999), and many others found a significant negative relationship between size and growth rate - that is the larger firms have lower growth rates. Hansen et al. (2005) using unique data of SMEs from 1997 and 2002 in Vietnam also found that the size of the firm is negatively related to the firm growth. Storey (1994), Jovanovic (1982), McPherson (1996), and Liedholm (2002) confirm this general pattern - that is that small firms grow more rapidly than large ones. The following relationship is hypothesized:

H2: Size of firm is negatively and significantly related to the growth of the firm.

Age of Firm

The age of a firm is also a widely used and independent variable in studying the growth of the firm. Storey (1994) notes that young firms are more likely to achieve significant growth than older firms. Wagner and Joachim (1995), Almus and Nerlinger (1999), and Wijewardena and Tibbits (1999) also confirm such a relationship. Age, then, is an important factor in determining business growth. The following relationship is hypothesized:

H3: Age of firm is negatively and significantly related to the growth of the firm.

Industry Sector

Industry structure or context is one of the first factors entrepreneurs have to consider, not only for their firm's start-up but also for their operation in the following periods.

Entrepreneurs base the strategic decisions for their firms on the industry context. Industry characteristics such as the stage of industry evolution, barriers to entry and mobility, nature of rivalry, power of buyers and suppliers, nature of buyer needs, and degree of industry heterogeneity and various industry sectors. Such characteristics provide both opportunities and challenges that affect the probability of survival and success of firms (Porter, 1980; Chrisman et al., 1998). This study focuses on different industry sectors classified by technological levels. Industry sectors with various technological levels have different impacts on the growth of a firm. In fact, much empirical research analyzed samples of firms reflecting technological level such as the semiconductor firms (Eisenhardt and Schoonhoven, 1990), technology-based firms (Kazanjian and Drazin, 1990; Lee et al., 2001), software firms (Zahra and Bogner, 2000), high tech and knowledge-intensive firms

(Bollingtoft, Ulhoi, Madsen and Neergaard, 2003), and technology-intensive firms (McGee and Dowling, 1994). Among these specific samples, the determinants that affect growth or performance of firms are different, and if similar contribution of those factors is not consistent. These samples showed that the performance of firms might be different among various industry sectors according to their technological levels, and these different samples should not be predicted by the same factors. Therefore, it is necessary to examine the growth of firms in different industry sectors, and the determinants for each specific industry sample. The following relationship is hypothesized:

H4: Growth of the firm is different among industry sectors with various technological levels.

Owner/manager Characteristics

Educational Background

Storey (1994) reviewed seventeen studies related to the education level of the entrepreneur. He found there is no relationship between educational backgrounds and growth in nine studies, but there is some form of positive relationship in eight studies. Once again, measurement problems are raised to explain these different results. In addition, the nature and grading of educational qualifications vary from country to country. However, the general positive results provide fairly consistent support for the point of view that a higher level of education is more likely to cause faster-growing firms. Moreover, in Vietnam's case, a higher level of education is often related to a higher reputation and position in firms. The following relationship is hypothesized:

H5: Educational background of owner/manager is positively and significantly related to the growth of the firm.

Prior Sector Experience

Storey (1994) also reviewed prior sector experience in nine of his studies. The result is mixed. Five studies do not show a relationship between business growth and prior sector experience of the owner/manager, three studies show that prior sector experience is associated with slower-growing firms, and one suggests that prior sector experience is related to faster-growing firms. Although there are different results, probably due to measurement problems as well as the samples used, prior sector experience of owner/manager is often associated with the growth of the firm. We therefore hypothesised that prior sector experience is significantly related to faster-growing firms.

H6: Prior sector experience of owner/manager has a positive and significant effect on the growth of the firm.

Gender

Previous studies suggest that there are a number of reasons why females and males perform differently in businesses. The majority of the literature generally found that male-owned/headed firms performed better than female-owned/headed firms. Female entrepreneurs have been stereotyped as conservative and risk-averse, while male entrepreneurs are seen as taking more risks than female entrepreneurs (Meier & Masters, 1988).

The liberal feminist theory asserts that SMEs operated by females prove to have poorer performance because females explicitly suffer discrimination by lenders and consultants or because of other systematic factors such as lack of relevant education and lack of experience that serve as barriers for females to access key resources (Fischer et al., 1993). Also, the social feminist theory suggests that males and females are inherently different in nature (Fischer et al., 1993). However, the differences between male and female approaches to doing businesses do not necessarily mean that male entrepreneurs are more effective than female entrepreneurs. The existing studies often compare differences between male and female characteristics and values. The findings confirm that differences exist but may not have a strong impact on firm performance (Fischer et al., 1993).

Several studies have shown that female entrepreneurs suffer from discrimination by

banks. For example, higher interest rates and a requirement for high level of collateral as well as for co-signers on loans and lines of credit to female-owned/headed firms (Stevenson, 1986). Riding and Swift (1990) also found that there was also a gender bias in Canadian banking practices in terms of interest rates on lines of credits and loans, requirements for loan collateral, rates of loan approvals, and co-signature requirements from spouses. These alone explained the differences in the characteristics of male-and female-owned/headed businesses. Fay and Williams (1993) observe that females can face gender discrimination when seeking start-up capital but such behavior by loan officers may not be intentional. The authors believe that the social construction of differential gender roles in western culture causes sex-discrimination that is unconscious or unintentional and thus difficult to change. Moreover, Fasci and Valdez (1998) found that male-owned/headed firms outperformed female-owned/headed firms in accounting practices. Based on the above-identified difficulties, it is clear that there are many disadvantages that female entrepreneurs experience in running a business, which could lead to underperformance. Furthermore, male entrepreneurs tend to have stronger network ties, which have traditionally been viewed as a way of obtaining power that is seen as critical to a manager's success (Bacharach & Laurer, 1988; Kanter, 1977). External networks can enhance the power of entrepreneurs in firms, for example, personal contact with partners, suppliers and customers, which can lead to the development of valuable and new products. This can help achieve superior performance in business practices.

As discussed earlier, the differences in gender-based performance are perceptible; therefore we hypothesized the following relationship:

H7: There are differences in gender-based growth of the firm.

3. Methodology

3.1. Data and sample

This study used data from the Productivity and Investment Climate Enterprise Survey[1] implemented by the World Bank in 2005. The survey was conducted in five main regions[2] of Vietnam. The total number of observations was 1,150 enterprises. All enterprises belonged to the manufacturing sector in different industries.

The sample that was analysed in this study is the manufacturing SMEs operating in those five regions of Vietnam.

The definition of SMEs used in this study follows the current definition of the World Bank as well as that of the Vietnamese Government[3]. Thus, SMEs are classified by the number of employees in three groups as follows: micro enterprises have up to 10 employees, small-scale enterprises up to 50 employees, medium sized enterprises up to 300 employees.

According to this classification of SMEs, there are 828 SMEs with the three-year average number of employees of from 10 to 300 people. However, to be suitable for this research that focuses on gender, only SMEs that were interviewed about whether their principal owners (or one of the principal owners) are a female are chosen. In that case, only SMEs owned/headed principally who are in the category of *family and individual* (out of the other categories asked about their largest shareholders in the dataset - including domestic company, foreign company, government or government agency, investment fund) are required to answer that question. In next step of the sampling, among these SMEs, after removing cases that began operating in 2003 and 2004

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[1] The general purpose of the survey is to understand the investment climate in Vietnam and how it affects business performance, with the objective of helping to improve it.
[2] Red River Delta, Mekong River Delta, Northern central, South East and Southern central coastal.
[3] Government Decree No.99/2001/CP-ND on "Supporting for Development of Small and Medium Enterprises"

including missing data, a total of 353 SMEs are used as the analysis sample in this study.

Table 3 shows that the majority of SMEs in our sample are operating in the traditional sectors such as food & beverage and wood & wood products, to make use of Vietnam's abundant resources and labour. In addition, based on industry classification by technological level (Lall, 2000) most of the SMEs are resource-based manufactures with 197 firms followed by 127 low technology manufactures (see Table 2). There are 273 male-owned SMEs compared to 80 female-owned. Table 4 shows that most of the SMEs are located in two of the most developed regions of the Red River Delta and South East Hanoi. Our sample also indicates that legal forms of limited liability and foreign direct investment (FDI company), and sole proprietorship are popular (see Table 5).

Table 2: Technological classification

Classification	Examples
Primary products:	Fresh fruit, meal, rice, cocoa, tea, coffee, wood, coal, crude, petroleum, gas
Manufactured products	
Resource-based manufactures	
Agro/forest-based products	Prepared meats/fruits, beverages, wood products, vegetables, oils
Other resource-based products	Ore concentrates, petroleum/rubber products, cement, cut gems, glass
Low-technology manufactures	
Textile/fashion cluster	Textile fabrics, clothing, headgear, footwear, leather, manufactures, travel goods
Other low technology	Pottery, simple metal parts/structures, furniture, jewelry, toys, plastic products
Medium technology manufactures	
Automotive products	Passenger vehicles and parts, commercial vehicles, motorcycles and parts
Medium technology process industries	Synthetic fibres, chemicals and paints, fertilizers, plastics, iron, pipes/tubes
Medium technology engineering industries	Engines, motors, industrial machinery, pumps, switchgear, ships, watches
High-technology manufactures	
Electronics and electrical products	Office/data processing/telecommunications equip, TVs, transistors, turbines, power-generating equipment
Other high technology	Pharmaceuticals, aerospace, optical/measuring instruments, cameras
Other transactions:	Electricity, cinema film, printed matter, "special" transactions, gold, art, coins, pets

Source: Lall (2000).

Table 3: Manufacturing sectors of Vietnam SMEs in the survey by WB (2005)

Industry	Frequency (number of enterprises)	Industry sector by technological level			Gender	
		RB	LT	MHT	Male	Female
1. Apparel	17	0	17	0	12	5
2. Basic metals	3	3	0	0	2	1
3. Chemical & Chemical product	23	23	0	0	18	5
4. Construction materials	32	32	0	0	23	9
5. Electrical machinery	5	0	0	5	5	0
6. Electronics	8	0	0	8	5	3
7. Food & Beverage	57	57	0	0	49	8
8. Leather products	2	0	2	0	2	0
9. Machinery and equipment	8	0	0	8	6	2
10. Metal products	31	0	31	0	25	6
11. Non-metallic mineral products	1	1	0	0	1	0
12. Other	32	25	3	4	23	9
13. Paper	23	0	23	0	17	6
14. Rubber & plastic products	31	0	31	0	23	8
15. Textiles	20	0	20	0	16	4
16. Vehicles and other transport equipment	4	0	0	4	4	0
17. Wood & wood prod, incl. furniture	56	56	0	0	42	14
Total	353	197	127	29	273	80

Table 4: Number of SMEs located in each of the five regions

Regions	Frequency	Percent
Red River Delta	87	24.03
Southern Central Coastal	61	16.85
South East	128	35.36
Mekong River Delta	31	8.56
Northern Central	46	12.71
Total	353	97.51

Table 5: Legal form of SMEs in the sample

Legal Form	Frequency	Percent
Joint Stock Company	63	17.40331
Limited liability and FDI company	157	43.37017
Sole proprietorship	123	33.9779
One member Ltd Company	10	2.762431
Total	353	97.51381

3.2. Research variables

From the conceptual framework and hypothesis development, this empirical study contains seven specific independent variables and one dependent variable (growth of sales). Measurement of the variables is as follows:

New Product Introduction (NPI): The question is whether the firm developed an important new product line in the last two

years. Therefore, this variable is measured as a dummy variable (yes =1; no=0).

Firm size (FS): according to the definition of SMEs from the World Bank and that of the Vietnamese Government, the size of firm used in this study is measured by a scale from 10 to 300 employees.

Firm age (FA): This variable is measured by using scales from the year of establishment to the year 2005. SMEs used in this study were established in the years prior to, and including 2002. Therefore, the age of SMEs in this sample is from 3 to 47 years.

Educational Background (ED): This variable is measured by ordinal numbers from 1 to 6 corresponding to the level of education of the owner/manager from the lowest through the highest level: Did not complete high school; High school; Vocational training; Some College or University training; Graduate degree (BA, BSc etc.), and Post graduate degree (PhD, Masters).

Prior Sector Experience (PSE): This variable is measured by years of experience working in this sector before managing the firm. In this study, prior sector experience ranges from 0 to 40 years.

Industry sector (IS): There are many methods to classify industry sectors. However, this study focuses on the technological levels of products identified by Lall (2000). According to Lall, there are five technological levels of products including Primary products, Resource-based, Low-technology, Medium-technology and High-technology manufactures. Due to the availability of the data we have, only four levels are used - we excluded primary products. Based on these four levels, the numbers of firms are grouped into three smaller samples - Resource-based, Low-technology, and Medium and High-technology manufactures. Therefore, this variable is coded by ordinal numbers 1, 2 and 3 corresponding to three technological levels. The number of firms belonging to level 1, 2 and 3 in this sample is 197, 127 and 29, respectively.

Gender (GD): This refers to the gender of the principal owner of the firms. Male entrepreneur = 0, female entrepreneur = 1.

Growth of sale[4] *(GrS)*: In order to calculate growth, only the first year and end year data have been frequently used in previous studies. However, this method has been criticised because it models growth as one giant leap (Davidsson *et al.*, 2006). Therefore, in this study, growth rate of sales is calculated by the mean value of sales growth rate from 2002 to 2004.

4. Analysis

The quantitative method used in our study is Multiple Regression analysis. The relationship between independent and dependent variables is modeled in the following equation:

$$Y_i = a + bX_i + e$$

Where Y represents growth rate of sales (GrS) in i^{th} SMEs, X_i represents seven independent variables such as new product introduction (NPI), firm size (FS), firm age (FA), Industry sector (IS), educational background (EB), prior sector experience (PSE), gender (GD), a is intercept, and e is error term.

The relationship between the variables is illustrated in the equations below:

$$GrS = a + b_1 NPI + b_2 FS + b_3 FA + b_4 IS + b_5 EB + b_6 PSE + b_7 GD + e$$

5. Results and discussion

Table 6 provides the descriptive statistics including product moment correlation (Pearson), mean, and standard deviations of all variables in the research. The correlations among the independent variables are not

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[4] Davidsson et al., (2006) lists a range of growth indicators, which were used to measure growth, including assets, employment, market share, physical output, profits, and sales. There are three choices of indicators among the above alternatives: 1) use a multiple indicator index; 2) use alternative measures separately, and 3) use the best and most appropriate indicator (Davidsson et al., 2006). The third choice seems to receive an emerging consensus and the most preferred indicator should be sales growth (Weinzimmer et al., 1998; Davidsson et al., 2006).

significant or very low; therefore, this early analysis is indicating that there are no problems with multicollinearity that would violate assumptions for the general linear model.

Table 6: Descriptive statistics of all variables in the research

Variables	Mean	S.D	1	2	3	4	5	6	7	8
(1)NPI	0.3	0.46								
(2)FS	87.31	88.22	0.12*							
(3)FA	8.17	7.32	0.02	0.19**						
(4)IS	1.52	0.644	-0.005	-0.066	-0.03					
(5)ED	3.93	1.52	0.03	0.29**	0.08*	0.18**				
(6)PSE	9.31	7.69	0.02	0.13*	0.18**	0.12*	0.02			
(7)GD	0.23	0.42	0.28**	0.17*	-0.046	0.02	-0.022	-0.05		
(8)GrS	0.33	1.08	0.158*	0.14*	-0.06	-0.02	0.04	0.034	-0.09	

** and * shows statistical significance at 1% and 5% level, respectively

Table 7 shows the results of multiple regression analysis. The result shows New Product Introduction (NPI) has a positive impact on the growth rate of sales at 1% level of significance. Similarly, Firm Size (FS) has a positive effect on the growth rate of sales at 1% level of significance. On the other hand, Firm age (FA) and Gender (GD) have a negative influence on growth rate of sales at 5% and 1% level of significance, respectively. Industry Sector (IS), Educational Background (EB) and Prior Sector Experience (PSE) are insignificant.

These findings support hypotheses *H1, H3* and *H7*, and reject the hypotheses *H2, H4, H5* and *H6*.

Table 7: Results of multiple regression analysis

Explanatory Variables	Growth rate of sales	
	Coefficient	VIF
Constant	0.29	
New Product Introduction	0.45**	1.09
Firm Size	0.002**	1.21
Firm Age	-0.016*	1.07
Industry Sector	-0.02	1.08
Educational Background	-0.007	1.15
Prior Sector Experience	0.003	1.07
Gender	-0.44**	1.13
R square	0.075	0.093
Adjusted R square	0.056	0.064
F statistics	3.989	3.245
Durbin-Watson	1.945	1.893
N(firms)	353	197

** and * indicate statistically significance at 1% and 5% level, respectively

Hypothesis *H1* is supported; SMEs that engaged in new product introduction have a higher growth rate than SMEs who do not introduce new products. This finding is consistent with Storey's (1994) study and almost all research, such as Dunkelberg et al. (1987) and Wynarczyk et al. (1993), outlines the significance of this variable. This strategy is always important for the growth of sales.

Hypothesis *H2* is rejected but the variable Firm Size has a statistically significant impact on growth at the 1 percent level. This means the larger the size of a business, the greater the growth. This is an interesting finding because this goes against the fairly consistent pattern where small firms grow faster than large firms. This finding is similar to the Kalleberg and Leicht (1991) and Johnson (1989) studies.

Hypothesis *H3* means that the younger the age of a firm, the greater its growth. In other words, younger businesses grow more rapidly than older ones. This corresponds well with the findings obtained in most of the theoretical and empirical literature on SMEs.

Hypothesis *H4* is rejected. It means that there is no statistically significant difference among industry sectors by technological level in terms of sales growth.

Both hypotheses *H5* and *H6* are rejected. The reasons are likely to be that most of the owner/managers in the sample have a relatively high education. In many cases, experience made little sense because some old owner/managers came from SOEs, therefore their experience could not be applied in the new business environment and they had difficulty in learning new strategies. Vietnamese firms operate in a rapidly evolving and unstable environment. Moreover, the kind of knowledge that these owner/managers have learned in universities and in training courses clearly has been of little use to them in business. There is now a lot of western-style business training courses available in Vietnam, but a Vietnamese manager who is looking for a high-quality, practical and applicable business management training course that is taught in Vietnamese will find little

available (Webster et al., 1999). Therefore, in many cases, education or experience are not determinants for firm growth.

Hypothesis *H7* is supported; it demonstrates that there are differences in gender-based growth of firms. As shown in the regression results male-owned/headed firms perform better than female-owned/headed firms at a 1 percent level. One possible interpretation is that males are risk takers by nature and/or socially, while female counterparts are risk adverse (Meier & Masters, 1988). It could be that male-owned/headed firms employ different strategies to achieve better performance. For example, male-owned/headed firms may obtain credits to finance strategic business activities. They also spend less time on domestic roles at home so that they can concentrate on their business practices. Male entrepreneurs have more advantages in terms of credit and networking with external partners (Smeltzer & Fann, 1989), while female entrepreneurs have disadvantages in many ways. Examples include discrimination from banking practices as well as overwhelming responsibilities for families, which means they spend less time taking care of the business.

6. Conclusions

This study focused on analyzing the relationships between gender, innovation and the growth of the SMEs sector in Vietnam. This included examining the relationship between seven independent variables (firm size, firm age, industry sector, strategy of new product introduction (focused), educational background and prior sector experience of owner/managers, and gender of principal owner (focused)) and one dependent variable (growth rate of sales). Based on theoretical and empirical discussion found in the literature, the model of growth of SMEs used in this study followed the framework outlined by Storey (1994).

From the empirical results, we can conclude that SMEs engaged in new product introduction

have a higher growth rate than SMEs who do not introduce new products. In terms of the impact of firm age, younger businesses grow more rapidly than older ones. There are differences in the gender-based growth of firms in which male-owned/headed firms perform better than female-owned/headed firms. However, firm size, industry sector, education and experience of owner/managers are not determinants for the growth of SMEs in the Vietnamese case.

Based on the empirical findings, we can draw some implications for the SMEs, the government sectors and researchers. For the SMEs sector, firstly, owners/managers should implement the strategy of new product introduction. They should engage in the strategy of technological innovation and human resource training. This kind of strategy should be long term and should be planned carefully. Secondly, investment in practical training for entrepreneurs needs to be done continuously in order to improve skills and knowledge at the leadership levels for both gender headed firms. In addition, although working experience and education are not determinants in this sample, they will be important in a new business context following Vietnam's WTO membership in 2006 because they impart necessary capabilities, skills and knowledge, which are critical to firm performance.

For the government, the different backgrounds of both firms lead to different outcomes, thus gender differences should be considered in the policies for female owned firms. The government should pay more attention to female owned firms because they have just entered the economy and are not as mature as male-owned/headed firms. Thus, female-owned/headed firms should have more support from the government in order to improve their performance. The government may assist the female-owned/headed firms to reflect on gender-based differences so that it can mitigate such differences. The government can help both firms by providing training, improving the educational system and having

useful business development services in order to produce qualified entrepreneurs for private firms. These policies can reduce the difference gaps in terms of the growth of male and female headed firms.

For researchers, this study provides additional empirical evidence that SMEs' growth should be based on a multidimensional framework. Particularly, the multidimensional model should be tested in developing countries where socio-economic conditions are rather vulnerable. Moreover, when researching any samples, the multidimensional model should be modified in conformity with practical conditions of each sample. Specifically, hypotheses *H2, H4, H5* and *H6* are rejected in Vietnam's case. Obviously, the growth of SMEs is multidimensional and contingent.

Like all other research, this study also has some limitations. The data used in this study has some weaknesses. The data comes from a World Bank survey. Some important variables could not be included in the study's model because the measurement of those variables was not appropriate.

Finally, based on this study, further studies should be implemented with the support of a more comprehensive and coherent theoretical background. Although this study focuses much on gender and innovation in relation to firm growth, further studies should consider building a better and comprehensive model of growth by adding other important external factors in the model to reflect actual conditions. For instance, the effect of government support to SMEs in Vietnam appears as an interesting variable for analysis. There are forms or aspects of growth that our data did not capture (such as growth achieved through acquisition). This is a potentially important form of growth that should be considered in the design of future studies. This study used a model that captures only the direct effects on growth. Future studies should also consider other effects such as mediated or moderated effects. These effects may show better results.

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References

[1] Almus M. and E. A. Nerlinger (1999), "Growth of New Technology-Based Firms: Which Factors Matter?", *Small Business Economics* 13(2), pp. 141-154.

[2] Bacharach, S. B. and Lauer, E. J. (1988), *Power and Politics in Organization*. Jossey-Bass: San Francisco.

[3] Barkham R., Hart M., and Hanvey E. (1996), "Growth in Small Manufacturing Firms: An Empirical Analysis", in R. Blackburn and P. Jennings (eds), Small Firms Contribution to Economic Regeneration, Paul Champman, London.

[4] Berry A. (2002), "The role of the small and medium enterprise sector in Latin America and similar developing countries" [online document]. Retrieved May, 6, 2007, the World Wide Web:∫http://diplomacy.shu.edu/journal/new/pdf/Vol IIINo1/berry.pdf.

[5] Bollingtoft, A., Ulhoi, J. P., Madsen, H. and Neergaard, H. (2003), "The effect of financial factors on the performance of new venture companies in high tech and knowledge-intensive industries: An empirical study in Denmark", *International Journal of Management*, 20(4): 535-547.

[6] Chrisman, J. J., Bauerschmidt, A. and Hofer, C. W. (1998), "The determinants of new venture performance: An extended model", *Entrepreneurship Theory & Practice*, 23(1): 5-29.

[7] Churchill C. N. and Lewis V. L. (1983), "The five stages of small business growth" in Storey D. J., *Small Business: Critical Perspectives*, Vol. 3, pp. 291-308. London: Routledge.

[8] Davidsson P. (1991), "Continued Entrepreneurship: Ability, Need and Opportunity as Determinants of Small Firm Growth", *Journal of Business Venturing*, Vol. 6, pp. 405-29.

[9] Davidsson P. and Henreksson M. (2002), "Institutional determinants of the prevalence of start-ups and high-growth firms: Evidence from Sweden", *Small Business Economics*, Vol. 19, No. 2, pp. 81-104.

[10] Davidsson P., Achtenhagen L. and L. Naldi (2006), "What do we know about small firm growth?", in Parker S., *Handbook of Entrepreneurship Research*, Vol. 2, pp. 361-398. New York: Springer.

[11] Dunkelberg, W. G. and Cooper, A. C., Woo. C. and Dennis, W. J. (1987), "New firm growth and performance", in N. C. Churchill, J. A. Hornaday, B. A. Kirchhoff, C. J Krasner and K. H.Vesper (eds), *Frontiers of Entrepreneurship Research*, Babson College, Boston, Mass.

[12] Evans and David S. (1987), "Tests of Alternative Theories of Firm Growth", *Journal of Political Economy*, Vol. 95, No. 4, pp. 657-674.

[13] Eisenhardt, K. M. and Schoonhoven, C. B. (1990), "Organizational growth: Linking founding team, strategy, environment, and growth among U.S. semiconductor ventures, 1978-1988", *Administrative Science Quarterly*, 35(2): 504-529.

[14] Fasci, M. A., and Valdez, J. (1998), "A performance contrast of male and female-owned small accounting practices", *Journal of Small Business Management*, 36(3), 1-8.

[15] Fay, M., and Williams, L. (1993), "Gender bias and the availability of business loans", *Journal of Business Venturing*, 8(5), 363-376.

[16] Fischer, E. M., Reuber, A. R., and Dyke, L. S. (1993), "A theoretical overview and extension of research on sex, gender and entrepreneurship", *Journal of Business Venturing*, 8(2), 151-168.

[17] Greiner L. E. (1972), "Evolution and revolution as organisations grow", *Harvard Business Review*, No. July-August, pp. 37-46.

[18] GSO (2005), *The real situation of enterprises through results of surveys* conducted in 2001, 2002 and 2003. Statistics Publishing House: Hanoi.

[19] Hall B. H. (1987), "The Relationship between Firm Size and Firm Growth in the U.S. Manufacturing Sector", *Journal of Industrial Economics*, Vol. 35, No. 4, pp. 583-606.

[20] Johnson, P.S. (1989), "Employment change in the Small Establishment Sector in UK Manufacturing", *Applied Economics*, Vol. 21, pp. 251-60.

[21] Jovanovic B. (1982), "Selection and the Evolution of Industry", *Econometrica*, Vol. 50, No. 3, pp. 649-670.

[22] Kalleberg, A. L. and Leicht, K. T. (1991), "Gender and organizational performance: Determinants of small business survival and success", *Academy of Management Journal*, 34(1), 136-161.

[23] Kanter, R. M. (1988), "When a thousand flowers bloom: Structural, collective, and social conditions for innovation in organizations". Staw, B. M.; Cummings, L. L. (eds) In Research in *Organizational Behavior* (Vol. 10). Greenwich, CT: JAI Press.

[24] Kazanjian, R. K. and Drazin, R. (1990), "A stage-contingent model of design and growth for

technology based new ventures", *Journal of Business Venturing*, 5(3): 137-150.

[25] Lall, S. (2000), *The technological structure and performance of developing country manufactured exports, 1995-1998*, Oxford Development Studies, 28(3): 337-369.

[26] McGee, J. E. and Dowling, M. J. (1994), "Using R&D cooperative arrangements to leverage managerial experience: A study of technology-intensive new ventures", *Journal of Business Venturing*, 9(1): 33-48.

[27] McPherson M. A, (1996), "Growth of Micro and Small Enterprises in Southern Africa", *Journal of Development Economics*, Vol. 48, pp. 253-277.

[28] Meier, R. and Masters, R. (1988), "Sex differences and risk-taking propensity of entrepreneurs", *Journal of Small Business Management*, 26(1), 31-35.

[29] Liedholm C. (2002), "Small Firm Dynamics: Evidence from Africa and Latin America", *Small Business Economics*, Vol. 18, pp. 227-242.

[30] Porter, M. E. (1980), *Competitive strategy*. New York: The Free Press.

[31] Rand J., Tarp F., Dzung N. H. and Vinh D. Q. "Documentation of the Small and Medium Scale Enterprise (SME) Survey in Vietnam for the year 2002" [online document]. Retrieved May, 10, 2007, from the World Wide Web: http://www.econ.ku.dk/rand/images/VNDodumentation02.pdf.

[32] Riding, A. L., and Swift, C. S. (1990), "Women business owners and terms of credit: some empirical findings of the Canadian Experience", *Journal of Business Venturing*, 5(5), 327-340.

[33] Scott M. and Bruce R. (1987), "Five Stages of Growth in Small Businesses", *Long Range Planning*, Vol. 20, No. 3, pp. 45-52.

[34] Smeltzer, L. R. and Fann, G. L. (1989), "Gender differences in external networks of small business

owners/managers", *Journal of Small Business Management*, 27(2), 25-32.

[35] Stevenson, L. (1986), "Against all odds: The entrepreneurship of women", *Journal of Small Business Management*, 24(4), 30-36.

[36] Storey D. J. (1994), *Understanding the Small Business Sector*. London: Routledge.

[37] Storey D. J. (2000), "Small Business: Critical Perspectives on Business and Management", *Routledge*, Vol. 3, pp. 287-290, London: Routledge.

[38] Wagner and Joachim (1995). "Exports, Firm Size, and Firm Dynamics", *Small Business Economics*, Vol. 7, No. 1, pp. 29-39.

[39] Weinzimmer L. G., Nystrom P. C. and Freeman S. J. (1998), "Measuring organisational growth: Issues, consequences and guidelines", *Journal of Management*, Vol. 24, No. 2, pp. 235-262.

[40] Wijewardena Hema and G. E. Tibbits (1999), "Factors Contributing to the Growth of Small Manufacturing Firms: Data from Australia", *Journal of Small Business Management*, Vol. 37, No. 2, pp. 88-96.

[41] Webster L. and Taussig M. (1999), "Vietnam's under-sized engine: A survey of 95 larger private manufacturers"[online document]. Retrieved October 10, 2006 from the WWW: http://www.ifc.org/ifcext/mekongpsdf.nsf/AttachmentsByTitle/PSDP+8/$F LE/PSDP-No-8-EN.pdf

[42] Wynarczyk, P., Watson, R., Storey, D.J., Short, H. and Keasey, K. (1993), *The Managerial Labour Market in Small and Medium Sized Enterprises*, Routledge, London.

[43] Zahra, S. and Bogner, W. (2000), "Technology strategy and software new ventures' performance: Exploring the moderating effects of the competitive environment". *Journal of Business Venturing*, 15(2): 135-173.

Giới, đổi mới và tăng trưởng của các doanh nghiệp vừa và nhỏ: Phân tích thực nghiệm về các công ty sản xuất ở Việt Nam

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Tóm tắt. Nghiên cứu này phân tích mối quan hệ giữa giới, sự đổi mới và tăng trưởng của các doanh nghiệp sản xuất quy mô vừa và nhỏ (SMEs) ở Việt Nam. Bài viết đã xây dựng một mô hình kinh tế lượng dựa trên khuôn khổ lý thuyết hay mô hình tăng trưởng của SMEs của Storey năm 1994. Cụ thể hơn, bài viết đã sử dụng mẫu phân tích gồm 353 doanh nghiệp có quy mô nhỏ từ bảng dữ liệu thứ cấp của Ngân hàng Thế giới. Sau khi phân tích mô hình hồi quy tuyến tính, kết quả đã chỉ ra rằng giới, chiến lược giới thiệu sản phẩm mới, quy mô và tuổi doanh nghiệp là những nhân tố quyết định đến sự tăng trưởng của các doanh nghiệp này. Cuối cùng, bài viết đề xuất một số kiến nghị cho SMEs, chính phủ và các nhà nghiên cứu cũng như định hướng nghiên cứu trong tương lai.