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The Roles of Human and Social Capital in the Development of Manufacturing SMEs in Vietnam

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Abstract

Many studies show that promotion of the development of small and medium-sized enterprises (SMEs) in developing countries requires support for innovation. Nevertheless, there have been few rigorous studies about determinants of innovation carried out by SMEs, especially in transition economies. Based on data collected from surveys of SMEs from 2005 to 2011, this study shows that the human and social capital of SMEs is a key to innovation in product, production process, marketing, and performance of SMEs in Vietnam.

Keywords: Innovation, SMEs, human capital, social capital.

1. Introduction

Small and medium-sized enterprises (SMEs) are important in transition economies because they help reduce poverty. According to the OECD (2004), SMEs account for more than 90% of the enterprises in the non-farm sector and create a great deal of employment. In countries in the Asia-Pacific region, SMEs play a central role in promoting economic dynamism, innovation and job creation (UN, 2012). As a result, governments of many developing countries are eager to support the development of SMEs.

It is widely agreed that innovation is a key to the development of enterprises. It is found that multifaceted innovation, including direct procurement of materials, direct sales of products, establishment of brand names, link-up with traders, internalization of key parts, improvement in the quality of materials, and diversity of products, is crucial to the development of enterprises, of which the majority are SMEs, in industrial clusters in developing countries (Sonobe et al., 2007; Akoten and Otsuka, 2007; Rabellotti, 1995; Schmitz, 1999; Nadvi, 1999; Cawthorne, 1995; and Gereffi, 2001). These studies also reveal that the human capital of the enterprises is an essential determinant of the multifaceted innovation.

In Vietnam, a few rigorous studies show that innovation is important for development of SMEs. Hansen et al. (2006) emphasize that innovation had positive and significant effects on the survival of SMEs during the 1990-2000 period. According to CIEM (2012), enterprises that improved products had a higher growth in employment and lower exit rates, and formal schooling of the owners/managers had significant effects on the innovation of SMEs. Nguyen et al. (2008) find that innovation is important for exports of SMEs. Nam et al. (2009) and Nam et al. (2010) show that in an iron and steel industrial cluster the household enterprises that carry out multifacted innovation perform better than others. In these studies, they show that formal schooling, experience, and social capital, measured by the family ties of the proprietors of the enterprises, determine innovation. Nevertheless, there have been few rigorous studies about what determines the innovation and performance of SMEs in Vietnam.

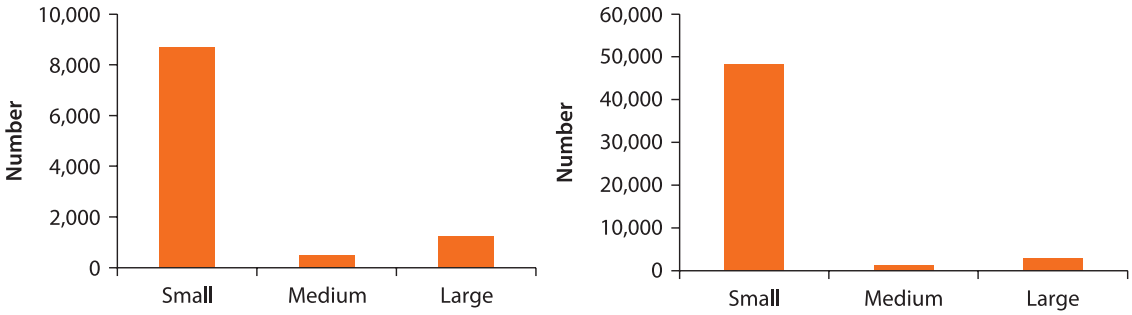
This study fills the gap in the literature by using data from surveys of SMEs conducted in Vietnam from 2005 to 2011. It is found that the human capital of the owners/managers of SMEs acquired by formal schooling and practical experience, quality of workers, and social capital of the owners/mangers formed through networks and previous jobs, determine the multifaceted innovation in product, production process, marketing, and performance of the SMEs.

The rest of this paper is organized as follows. Part 2 presents an overview of the SMEs. Part 3 shows a descriptive analysis and advances testable hypotheses followed by regression analysis that is presented in Part 4. Part 5 concludes the paper with some policy implications.

2. Overview of the SMEs

SMEs are defined as independent enterprises with a registered capital of no more than 10 billion VND, and an average annual workforce of less than 300. SMEs include state-owned enterprises, non-state enterprises, and foreign invested enterprises, of which the majority is non-state enterprises. According to CIEM (2012), in the survey of SMEs they conducted in 2011,

Figure 1: Size distribution of manufacturing firms in Vietnam



Note: The left distribution was for 2000 and the right was for 2011
Source: Hinh (2013)

about 70% of the number of SMEs were micro enterprises, which included a large number of household enterprises, and only about 6% were medium enterprises[1]. A more general picture about size distribution of manufacturing firms in Vietnam can be seen in Figure 1. It is clear that the problem of missing middle is quite serious for the growth and competitiveness of SMEs. In terms of sectorial structure, an increasing number of SMEs engages in services sector overtime.

During the last several decades, SMEs have emerged as a dynamic force for economic development (Hansen et al., 2006). According to Table 1, the number of SMEs outweighs other types of enterprises. More than 97% of the total number of enterprises is SMEs. The SMEs created a great number of jobs, which accounted for half of the total employment in all types of enterprises. A fair proportion of total capital was invested by SMEs and the SMEs generated about half the total revenue of all enterprises in Vietnam.

Even though SMEs in Vietnam are considered as a source of job creation and poverty reduction, they are not really taken as a source

Table 1: Position of SMEs in the economy

	2005	2006	2007	2008	2009	2010
Total number of all enterprises (1000)	112	129	156	206	249	286
Percentage of number of SMEs	97	97	97	98	98	98
Average number of workers per SME	23	22	21	19	18	17
Percentage of employment by SMEs	41	44	43	47	50	50
Percentage of capital of SMEs	32	50	36	38	42	47
Percentage of revenue of SMEs	48	54	53	57	59	54

Source: author's calculation from data collected from General Statistics Office

of growth through innovation. According to Nguyen et al. (2008), most of SMEs are non-state owned due to the progress of privatization. Hinh (2013) highlights that even though the number of SMEs outweighs other types of enterprises, private sector SMEs have lower productivity than state-owned enterprises (SOEs) and foreign-invested firms. As presented in the study of Sakai and Takada (2000), SMEs in Vietnam are lack of entrepreneurship and have low competitiveness. Indeed, there are many challenges that SMEs are facing including limited access to finance, land, technology, high-quality human resources, market constraints, outdated technology, and high transaction costs. Another problem with SMEs is that their links with SOEs and foreign-invested firms, which are considered as an important source of technological spill-overs and innovation, are weak. Such challenges limit SMEs to engage in R&D and innovation activities. In fact, SMEs have been mainly focusing on improving quality of their products rather than developing new products or any other types of innovation (Phi, 2013). As a result, it is increasingly difficult for SMEs to enhance their competitiveness and survive in a competitive market.

In terms of support for development, SMEs in Vietnam are getting moderate direct support from the government for innovation activities. Hinh (2013) indicates that the current industrial policies of Vietnam are mainly to support the establishment and not much the growth of SMEs.

Due to impacts of the global financial crisis, SMEs are facing even greater difficulties. According to a report of the CIEM (2012), 60% of the surveyed SMEs reported that the crisis negatively affected their businesses and they have reduced new investment and innovation in 2011 compared to 2009. Out of the more than 2,500 SMEs that participated in the survey in 2009, about 20% were closed by 2011 due to major reasons including the increasing difficulty of credit access, increasing inventories, and the employment of skilled labor due to a lack of information in the labor market. During the first 9 months of 2012, about 42,000 SMEs had been closed and 60% of the SMEs had a reduced number of employees.

3. Descriptive analysis and testable hypotheses

This study is based on a dataset from the surveys of manufacturing SMEs conducted in 2005, 2007, 2009, and 2011. These surveys were jointly carried out by the Central Institute of Economic Management (CIEM) under the Ministry of Planning and Investment (MPI), the Institute of Labor, Science and Social Affairs (ILSSA) under the Ministry of Labour, Invalids, and Social Affairs (MOLISA), the University of Copenhagen, UNU-WIDER, and the Embassy of Denmark in Vietnam. The total number of observations in these four surveys was 10,667. Each year, a number of new SMEs were added to the survey to replace the SMEs that have exited. Due to the missing values, 97 observations were dropped and, thus, a total of 10,570 observations remain for the analysis in this study. The dataset contains data on the characteristics of the owners/managers, innovation activities, and performance of the SMEs. These data were from 2004, 2006, 2008, and 2010, respectively.

According to Table 2, most of the owners/

Table 2: Characteristics of the owners/managers of the SMEs

	2004	2006	2008	2010
Average age of the owners/managers	44.7	51.3	45.7	45.7
Percentage of male owners/managers	69.4	66.8	65.6	62.7
Percentage of owners/managers who are of Kinh ethnicity	93.4	93.5	93.3	92.9
General education: % who completed primary school	7.5	8.2	9.0	8.4
General education: % who completed lower secondary school	31.8	31.3	28.0	27.9
General education: % who completed upper secondary school	57.9	56.0	59.2	62.2
Professional education: % who have a technical certificate	18.7	18.3	15.4	17.6
Professional education: % who completed college/university/post-graduate	2.1	1.3	20.8	24.2
Percentage of owners/managers who used to be:				
worker in state-owned enterprises	25.9	30.2	26.4	20.2
worker in non-state enterprises	25.2	19.7	22.9	26.2
manager of manufacturing enterprises	8.9	9.1	8.5	8.7
manager of service enterprises	19.5	14.2	16.2	18.5
Number of enterprises	2,802	2,615	2,642	2,528

Source: authors' calculation from the dataset

managers of the SMEs are aged ranging from 40 to 50 years. Most of them are male and are of Kinh ethnicity. Regarding formal general education, about 60% the owners/managers of the SMEs have completed upper secondary school. The percentage of the owners/managers who completed upper secondary school increased slightly from 2004 to 2010. The percentage of owners/managers who have completed university study, however, increased substantially from 2.1% in 2004 to 24.2% in 2010, suggesting that the owners/managers of the SMEs have become more educated overtime. In the literature, formal education is an important determinant of the innovation in enterprises, especially enterprises in industrial clusters in developing countries (Mengistae, 2006; Nichter and Goldmark, 2009; Sonobe et al., 2007; Akoten et al., 2006; Akoten and Otsuka, 2007; Iddrisu and Sonobe, 2006; Nam et al., 2009, 2010).

Practical experience of the owners/managers of the SMEs can be complementary to formal education. In this study, we measure the experience of the owners/managers by whether they used to be workers in and/or managers of manufacturing or service enterprises before establishing their own businesses. According to Table 2, about one fourth of the owners/managers have previous experience working in state-owned and non-state enterprises and managing service enterprises, while a smaller percentage of them used to be managers of manufacturing enterprises. We will explore the effects of this factor on innovation of SMEs in the regression analysis. Therefore, we advance the following hypothesis:

H1: *The owners/managers of the SMEs en-*

Table 3: Quality of workers

	2004	2006	2008	2010
Ratio to total regular workers (%):				
of professionals with college/university degree	3.8	3.2	3.7	3.6
of foremen and supervisors	1.8	1.2	1.1	1.4
of production masters	48.5	29.2	19.8	22.4
Number of enterprises	2,802	2,615	2,642	2,528

Source: author's calculation

dowed with more formal schooling and practical experience carry out more innovation and perform better than others.

Table 3 presents quality of workers, which is measured by the ratio of highly educated and skilled workers to total regular workers. The quality of workers is higher if workers have either higher formal education or more practical experience. The quality of the workers formed through formal education is measured by the ratio of workers who hold college/university degree(s) to total regular workers. The quality of the workers formed through their practical experience is proxied by the ratio of foremen and supervisors to total regular workers and the ratio of masters to total regular workers. Foremen and supervisors in the SMEs are those who have a lot of technical knowledge, which is accumulated through technical education and production experience. A foreman or a supervisor is often a leader of a group of workers and is responsible for technical issues during his/her production shift. Proprietors of the enterprises often rely on foremen and su-

Table 4: Networks of the owners/managers of the SMEs

	2004	2006	2008	2010
Percentage of owners/managers who belong to at least one enterprise association	9.6	10.2	10.2	7.6
Percentage of owners/managers who are a member of the Communist Party	9.3	7.6	7.2	9.5
Percentage of owners/managers who used to be:				
village/commune/district/provincial officials	6.3	4.6	4.6	3.1
war veteran	7.0	8.5	6.8	8.0
Number of members in the family	4.9	4.8	4.7	4.5
Number of enterprises	2,802	2,615	2,642	2,528

Source: author's calculation from the dataset

pervisors for not only technical issues, but also labor management and quality of the finished products, because the latter are even more knowledgeable than the former in managing production (Nam et al., 2009). Production masters are also knowledgeable about production techniques. Production masters are important workers in small enterprises because they are often responsible for improvement in products and the production process.

The ratios of workers with college/university degree(s) to total regular workers and that of foremen and supervisors to total regular workers are both small. The ratio of production masters to total regular workers is higher but not large. This fact shows that the quality of the workers in SMEs is not high and knowledge and skills in manufacturing are scarce. Thus, employment of workers who are highly educated and skillful might be a necessary condition for SMEs to carry out innovation. As a result, we advance the following hypothesis:

H2*: The SMEs that have workers who are more educated and have more practical experience are more likely to carry out innovation and to perform better than others.*

There is a small percentage of owners/managers who belong to at least one enterprise association and are a member of the Communist Party (Table 4). Similarly, less than 10% of the owners/managers of the SMEs used to be officials in governmental agencies at various local levels and/or are war veterans. Being a member of an association and a member of the Communist Party or having previously worked for governmental agencies may expand the business networks of the owners/managers. Such expanded networks are far from representing the complete social capital of the owners/managers. They, however, can reflect the possible benefits that the owners/managers may gain from their business networks. Thus, we would like to postulate the following hypothesis:

H3: *The owners/managers of the SMEs that have more social capital proxied by more extensive networks carry out more innovation and perform better than others.*

Table 5 presents additional characteristics of the SMEs including years of operation and conditions of physical infrastructure where the SMEs are located. A large proportion of the SMEs are located in areas where the physical infrastructure is in good condition, i.e. there is a main paved road leading to the SMEs and/or the SMEs have easy access to railways. It is

Table 5: Characteristics of the SMEs

	2004	2006	2008	2010
Years of operation	11.5	13.4	14.5	15.6
Percentage of SMEs where there is a main paved road leading to	77.1	76.2	78.1	77.7
Percentage of SMEs that have easy access to rail	77.1	37.7	57.9	51.2
Number of enterprises	2,802	2,615	2,642	2,528

Source: author's calculation from the dataset

Table 6: Percentage of the SMEs in various industries in 2010

	2010
Food products	29.7
Metal products	17.5
Wood products	10.0
Wearing apparel	9.5
Furniture products	7.1
Rubber and plastics products	4.8
Non-metallic mineral products	4.7
Paper and paper products	2.8
Leather and footwear	2.0
Electrical and electronics products	1.9
Chemicals and medicines	1.8
Machineries and equipment	1.1
Motor vehicles and transport equipment	1.0
Other products	6.1
Number of enterprises	2,528

Source: author's calculation from the dataset

noted that because the physical infrastructure is often lacking and poor, the enterprises that are located near to roads and railways tend to enjoy better conditions for growth such as having better access to raw materials and greater ease of transporting finished products to customers.

Specific industries in which SMEs are doing business in 2010 are shown in Table 6. The sampled SMEs are in various industries but concentrated in a few labor-intensive industries including food processing, metal products, wood products, wearing apparel, and furniture products.

Information about the types of innovation and performance of SMEs is presented in Table 7. It is possible to identify the multifaceted innovation of SMEs including whether or not the SMEs have introduced new product groups, improved existing products, introduced new production processes or new technologies, and exported their products directly. Exporting products is always more difficult than selling them domestically for the SMEs. Exported products tend to have a higher quality than those sold domestically. Therefore, exporting products is an essential innovation in the marketing activities of SMEs.

We combine the first two innovation activities, i.e. introduction of new product groups and improvement of existing products, to represent product innovation. By grouping the first two similar innovation activities innovation is reduced to encompassing three innovation groups of the SMEs, namely: product innovation, process innovation, and marketing innovation.[2]

According to Table 7, SMEs carried out more product innovation and process innovation than marketing innovation activities during the period 2004-2010. The difference in the percent-

Table 7: Innovation activities and performance of the SMEs

	2004	2006	2008	2010
Percentage of the SMEs that carried out product innovation	63.8	45.2	41.6	40.4
Percentage of the SMEs that carried out process innovation	29.5	15.5	13.9	13.3
Percentage of the SMEs that exported products directly	4.6	4.4	4.3	3.9
Real gross profit (billion VND)	0.21	0.24	0.25	0.26
Number of enterprises	2,802	2,615	2,642	2,528

Source: author's calculation

age of SMEs that carried out the former and the percentage of SMEs that carried out the latter is statistically significant. This finding is not surprising because the ability to carry out marketing innovation of the SMEs is limited due to lack of resources, knowledge about markets, and practical experience. The percentage of SMEs that carried out all types of innovation reduced gradually from 2004 to 2010, which may be partly explained by the negative effects of the global financial crisis that started in 2008.[3] The reduction in product and process innovation was more than that in marketing innovation. However, only the reduction in process innovation was statistically significant between 2004 and 2010. It is likely that due to the tightening of loans from commercial banks the SMEs were not able to make investments to improve products and production processes, resulting in a sharp reduction in product and process innovation. Meanwhile, most of the exported products of the SMEs are of low-quality and low-price, and thus were not seriously affected by the crisis. Also in this table, there is not much change in real gross profit, which is calculated by dividing gross profit by the GDP deflator, of the SMEs over the study period.

4. Regression analysis

Regression strategy

Analyzing the roles of human capital and social capital in SMEs development, which includes innovation activities and performance, requires testing the hypotheses postulated in the previous section. Following Sonobe and Otsuka (2006), the analysis is two-stage regressions. In the first-stage, both innovation activities and performance of SMEs are regressed on the same set of independent variables including human capital, social capital, and other characteristics of the owners/managers and of SMEs. In the second stage, performance will be regressed on innovation activities of SMEs.

Specifically, in the first stage, the following regression model is used:

$$FP = \beta_0 + \beta_1 X + \beta_2 HK + \beta_3 SK + \varepsilon \quad (1)$$

where FP is either innovation activities on product, production process, and marketing or performance of SMEs, measured by gross profit, X is a vector which includes variables for characteristics of the owners/managers including dummy variables for age, gender, ethnicity, previous jobs including having been a cadre, veteran, member of communist party,

previous working experience including a worker in SOEs, a worker in non-SOEs, a manager of manufacturing enterprise, a manager of service enterprise, a variable for number of people in owner/manager's household and variables for characteristics of SMEs including years of establishment, dummy variables for having access to main road, access to railway, and nine regional dummies for the locations of SMEs, *HK* is a vector for human capital of SMEs including dummy variables for human capital of the owner/manager proxied by his/her educational levels categorizing into graduating from primary, junior secondary, upper secondary, college/university, and having technical certificates and variables for quality of the employees proxied by the ratios of employees with college/university degree, ratios of foremen/supervisors, and ratios of masters, *SK* is a vector for social capital of SMEs proxied by having membership in any association. These first-stage regressions will reveal effects of two main interested factors, i.e. human capital and social capital, on innovation activities and performance of SMEs.

In the first-stage regression, an OLS model with a robust standard error is used for the regression of gross profit. Because the variables for innovation activities take on the values of 1 if SMEs carry out innovation and 0 otherwise, a Logit model is applied. To exploit the panel data and deal with time-invariant factors that may affect the regression results, Fixed Effect models are applied in addition to the OLS and Logit models.

In the second stage, the following regression model is used:

$$P = \beta_0 + \beta_1 X + \beta_2 I + \varepsilon \quad (2)$$

where P is performance of SMEs measured by gross profit, X is the same vector as in the first-stage regression, I is a vector for innovation activities of SMEs. The relationship between I and P is potentially endogenous. As a result, direct estimation of the equation (2) by using OLS model without taking the endogeneity into account will lead to a biased estimate of the effects of innovation activities on performance of SMEs. This is because I may be correlated with the error term ε. An ideal solution to deal with the endogeneity of variable I is the instrumental variable approach (IV) model (Lachenmaie and Wößmann, 2006). Application of the IV model amounts to finding of an instrumental variable that affects I but does not affect P directly. Unfortunately, we have not been able to find such instrumental variable. Thus, we decided to apply the Fixed Effect model for the second-stage regressions. Indeed, the Fixed Effect model cannot solve the endogeneity problem completely but it will help to neutralize the impact of the endogenous variable.

Regression results

Results for the first-stage regressions on determinants of innovation are presented in Table 8. Coefficients of variables representing education of the owners/managers at primary education and junior secondary education are positive and statistically significant in regressions in Columns (1) and (2), suggesting that attaining the lowest educational level is advantageous to the owners/managers compared to their counterparts with lower education but such qualification is only helpful for product innovation and may not help to carry out further innovation in production process and

marketing activities. The coefficients of variables indicating the owners/managers' education at upper secondary school are positive in all regressions but only statistically significant in the product and process innovation regressions. The same results are for the coefficients of variables representing technical education of the owners/managers. These results indicate that higher formal education and technical education is more important for the owners/managers in innovation activities. The coefficients of the dummy variables for the highest level of general education of the owners/managers, i.e. completing college/university, are positive and highly significant in all of the regressions. These findings indicate that the owners/managers with higher general education and technical education tend to innovate more than others and, thus, support our hypothesis H1.

Variables representing experience in production and management of the owners/managers are positive and statistically significant in a number of regressions for innovation in products and production process, indicating that apart from formal education production and experience of the owners/managers acquired during their previous work is important to carry out innovation in SMEs. Because experience reflects human capital acquired from practices this finding further supports Hypothesis H1 about the importance of human capital in innovation of SMEs. It is interesting to observe in Table 8 that the ratio of workers who completed college/university has positive and statistically significant effects on the innovation of the SMEs in all regressions. Similar results are also found for the ratio of foremen and supervisors, who are often much more knowledgeable than ordinary workers. The ratio of masters is not statistically significant in any regression. This finding is reasonable since masters are often important in traditional village industries in Vietnam, especially for their expertise and experience in producing handicraft products, but may not important in manufacturing SMEs. These findings suggest that the quality of workers is one of the keys for innovation in SMEs and support Hypothesis H2. These findings confirm that human capital is an important determinant of the innovation of SMEs in Vietnam.

The regression results in Table 8 also reveal that networks of the owners/managers, which are reflected by the variable *member of an association*, contribute positively and significantly to innovation of SMEs. Possible networks formed through previous jobs of the owners/managers, such as having been cadre and veterans also have positive effects on innovation in some regressions. These findings show that in addition to human capital social capital of the owners/managers is important for innovation activities of SMEs, thus supporting our hypothesis H3.

Table 8 also shows that better access to physical infrastructure including roads and railways facilitates innovation activities of SMEs. This finding suggests that lack of good physical infrastructure is one of the impediments to the development of the SMEs in Vietnam. In addition, it is found that the coefficients of variable *age of owners/managers* are negative and statistically significant in the regressions for product and process innovation. This finding implies that younger owners/managers tend to be more active than their older counterparts in

Table 8: Determinants of innovation of the SMEs

	Product innovation		Process innovation		Marketing innovation	
	Logit	FE	Logit	FE	Logit	FE
	(1)	(2)	(3)	(4)	(5)	(6)
Gender (Male=1)	0.048	0.060	0.069	0.082	-0.127	-0.116
	(0.050)	(0.060)	(0.060)	(0.070)	(0.110)	(0.200)
Age of owners/managers	-0.015***	-0.015***	-0.012***	-0.013***	0.008	0.006
	(0.001)	(0.001)	(0.001)	(0.001)	(0.010)	(0.010)
Ethnicity (Kinh=1)	0.092	0.141	0.138	0.157	0.152	0.465
	(0.100)	(0.110)	(0.130)	(0.150)	(0.240)	(0.440)
Primary school	0.340**	0.365**	-0.080	-0.104	-0.460	-1.088
	(0.150)	(0.170)	(0.230)	(0.250)	(0.740)	(0.930)
Junior secondary school	0.307**	0.311**	0.120	0.093	-0.242	-0.783
	(0.140)	(0.150)	(0.210)	(0.230)	(0.620)	(0.800)
Upper secondary school	0.500***	0.518***	0.555***	0.554**	0.967	0.526
	(0.140)	(0.150)	(0.210)	(0.230)	(0.600)	(0.780)
Technical certificate(s)	0.421***	0.448***	0.271***	0.281***	0.218	0.437
	(0.060)	(0.060)	(0.080)	(0.080)	(0.200)	(0.290)
College/university	0.534***	0.563***	0.528***	0.554***	1.034***	1.497***
	(0.080)	(0.090)	(0.090)	(0.100)	(0.210)	(0.320)
Used to be a cadre	0.236**	0.262**	0.074	0.059	-0.300	-0.386
	(0.100)	(0.120)	(0.130)	(0.140)	(0.270)	(0.420)
Veteran	0.267***	0.292***	0.110	0.123	-0.106	-0.013
	(0.090)	(0.100)	(0.110)	(0.120)	(0.240)	(0.380)
Member of communist party	-0.147*	-0.169*	0.033	0.045	0.198	0.515*
	(0.090)	(0.100)	(0.110)	(0.120)	(0.200)	(0.310)
Worker in SOEs	0.153**	0.154**	0.020	0.004	0.448**	0.312
	(0.070)	(0.080)	(0.090)	(0.100)	(0.190)	(0.290)
Worker in non-SOEs	0.250***	0.256***	-0.015	-0.029	0.286	0.126
	(0.070)	(0.070)	(0.080)	(0.090)	(0.190)	(0.270)

Manager of manu. firm	0.119	0.116	0.022	0.017	-0.054	-0.655
	(0.090)	(0.090)	(0.110)	(0.130)	(0.300)	(0.470)
Manager of service. firm	0.222***	0.224***	0.216**	0.212**	0.119	0.012
	(0.070)	(0.080)	(0.090)	(0.100)	(0.200)	(0.310)
Ratio of col/univ. graduates	1.196***	1.289***	2.587***	2.857***	2.629***	3.752***
	(0.340)	(0.370)	(0.360)	(0.400)	(0.560)	(0.980)
Ratio of foremen & supervisors	1.821***	1.969***	2.448***	2.549***	2.929***	3.709**
	(0.610)	(0.600)	(0.600)	(0.640)	(0.940)	(1.870)
Ratio of masters	-0.041	-0.040	-0.052	-0.039	-0.053	0.038
	(0.080)	(0.090)	(0.100)	(0.110)	(0.210)	(0.330)
No. of people in household	0.009	0.008	0.018	0.018	-0.011	-0.033
	(0.010)	(0.010)	(0.010)	(0.020)	(0.030)	(0.050)
Years of establishment	-0.001	-0.002	-0.003	-0.004	-0.033***	-0.042***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.010)	(0.010)
Access to main road	0.192***	0.175***	0.313***	0.309***	0.406**	0.774***
	(0.060)	(0.070)	(0.080)	(0.090)	(0.170)	(0.280)
Access to rail	0.250***	0.267***	-0.047	-0.041	-0.212	-0.232
	(0.050)	(0.060)	(0.070)	(0.080)	(0.140)	(0.210)
Member of an association	0.706***	0.747***	0.727***	0.774***	1.562***	2.030***
	(0.080)	(0.090)	(0.080)	(0.090)	(0.130)	(0.230)
Constant	-0.606**		-1.394***		-5.922***	
	(0.240)		(0.330)		(0.800)	
Number of observations	10,570	10,570	10,570	10,570	10,570	10,570

*Note: All of the regressions include 13 dummy variables for industries, nine dummy variables for provincial locations, and three year dummy variables. Figures in the brackets are absolute values of standard errors. *,**and *** indicate significant levels at 10%, 5% and 1%, respectively.*

Table 9: Determinants of performance of the SMEs

	Real gross profit		
	OLS	FE	FE
	(1)	(2)	(3)
Product innovation			0.014
			(0.040)
Process innovation			0.087*
			(0.050)
Marketing innovation			0.794***
			(0.240)
Gender (Male=1)	-0.124**	-0.080	-0.081
	(0.060)	(0.050)	(0.050)
Age of owners/managers	-0.004**	0.000	-0.001
	(0.001)	(0.001)	(0.001)
Ethnicity (Kinh=1)	0.216***	0.099	0.084
	(0.070)	(0.060)	(0.060)
Completed primary school	-0.002	0.004	0.009
	(0.020)	(0.010)	(0.010)
Completed junior secondary school	0.004	0.031	0.035*
	(0.020)	(0.020)	(0.020)
Completed upper secondary school	0.050**	0.092***	0.082***
	(0.020)	(0.030)	(0.020)
Having technical certificate(s)	0.028	0.009	0.000
	(0.030)	(0.030)	(0.030)
Completed college/university	0.377***	0.247***	0.209***
	(0.070)	(0.050)	(0.050)
Used to be a cadre	-0.129***	-0.052	-0.044
	(0.040)	(0.040)	(0.040)
Veteran	0.003	0.002	-0.002
	(0.040)	(0.030)	(0.030)

Member of communist party	0.147**	0.133**	0.127**
	(0.070)	(0.060)	(0.060)
Worker in state-owned enterprise	0.075	0.078	0.076
	(0.050)	(0.070)	(0.070)
Worker in non-state enterprise	0.058	0.118*	0.119*
	(0.050)	(0.070)	(0.070)
Manager of manufacturing firm	0.063**	0.073*	0.077**
	(0.030)	(0.040)	(0.040)
Manager of service firm	0.059	0.078	0.076
	(0.060)	(0.050)	(0.050)
Ratio of college/univ. graduates	0.519*	0.469*	0.348
	(0.290)	(0.260)	(0.280)
Ratio of foremen & supervisors	0.230	0.198	0.106
	(0.380)	(0.350)	(0.350)
Ratio of masters	0.110	0.097*	0.098*
	(0.070)	(0.050)	(0.050)
Number of people in household	-0.009	-0.005	-0.004
	(0.010)	(0.010)	(0.010)
Years of establishment	0.005*	0.005	0.005
	(0.001)	(0.001)	(0.001)
Access to main road	0.073***	0.044*	0.036
	(0.020)	(0.020)	(0.020)
Access to rail	-0.010	0.013	0.016
	(0.050)	(0.050)	(0.050)
Member of an association	0.436***	0.169	0.110
	(0.130)	(0.140)	(0.120)
Constant	-0.124	-0.14	-0.169
	(0.200)	(0.250)	(0.260)
Number of observations	10,570	10,570	10,570

*Note: All of the regressions include 13 dummy variables for industries, nine dummy variables for provincial locations, and three year dummy variables. Figures in the brackets are absolute values of standard errors. *,**and *** indicate significant levels at 10%, 5% and 1%, respectively.*

carrying out innovation in products and production process. The variables *years of establishment* have negative and statistically significant coefficients in the marketing innovation regressions, suggesting that newly established SMEs tend to have better marketing channels than others. Finally, Table 8 shows that there is now bias in gender in innovation of SMEs.

Table 9 presents the second stage regressions or the determinants of performance of SMEs, which is measured by real gross profit. In both the OLS and FE models in all regressions, variables for the human capital of the owners/managers acquired through formal education at college/university and upper secondary levels have positive and statistically significant coefficients, suggesting that human capital is important for performance of SMEs. Variables for having been a worker in non-state enterprises and a manager of a manufacturing firm are also positive and significant in performance regressions. In addition, the ratio of the workers with a college/university degree is positive and significant in the first two regressions. All of these findings indicate that having better human capital is crucial for higher performance of SMEs.

Variables for member of an association and member of the communist party are positive and significant in many regressions, further suggesting the important role of social capital of SMEs. Moreover, easy access to main roads have positive and significant effects on real gross profit, indicating that physical infrastructure is important for performance of SMEs.

The most important regression in this second stage is presented in the third column in Table 9. In this regression of real gross profit, all types of innovation are included and a Fixed Effect model is applied. It is shown that all variables for innovation have a positive coefficient in the regression. Coefficients of variables for process innovation and marketing innovation are statistically significant and that for product innovation is positive but not significant. These results confirm that innovation in production process and marketing activities determines the performance of SMEs.

5. Conclusion

Many studies attach the importance of innovation to the performance of enterprises. Nevertheless, little is known about the roles of human capital and social capital in innovation of SMEs in transition economies. This study inquires into the effects of such capital on multifaceted innovation and performance of SMEs in Vietnam. The study reveals that the formal education and practical experience of owners/managers is an essential factor. The quality of the workers, which is measured by their formal schooling and technical experience, is also of no less importance for the SMEs to carry out innovation and perform better. In addition, the study shows that being a member of an association and possibly having networks through previous jobs promotes the innovation and performance of SMEs. It is also worth noting that innovation in production process and marketing activities leads to higher performance of SMEs. Moreover, the study finds that the physical infrastructure, especially the road system, contributes greatly to the innovation and performance of SMEs.

Findings in this study have several policy implications for the public sector to promote the development of SMEs in Vietnam. First of all, it is important to provide formal education,

especially education at levels higher than lower secondary, to the owners/managers and employees of SMEs. For these owners/managers technical education and hands-on experience through learning-by-doing is also no less important than formal education. Given that it is difficult for the owners/managers to spare some time for long formal education, short training programs on technical and management knowledge such as knowledge and skills to innovate should be given to the owners/managers. Provision of such education should not be only limited to the owners/managers of SMEs. Employees of SMEs should be equipped with such formal education and practical knowledge because they are the ones who carry out innovation. Secondly, support of the public sector for the establishment of more business associations of SMEs, whether it be formal or informal, or for encouraging the owners/managers to join existing associations might be effective in promoting the innovation and performance of SMEs. Finally, it is a potential for the public sector to supply adequate physical infrastructure, especially roads, to effectively facilitate innovation and support the development of SMEs in Vietnam.

Notes:

1. SMEs include micro, small, and medium enterprises. Micro enterprises have 1-9 workers. Small enterprises have 10-49 workers. Medium enterprises have 50-299 workers.
2. It is noted that the data in Table 7 only represents the percentage of SMEs that have carried out the corresponding innovation. These data do not tell us in detail about innovation, such as how the innovation is carried out or how much was spent on carrying out the innovation. As such, the data do not allow us to analyze the innovation further. Nevertheless, Table 7 does provide us with a general picture about the innovation activities of SMEs in Vietnam.
3. During the crisis, SMEs in Vietnam were facing great difficulties due to the shrinkage of demands in the world and the domestic markets leading to the pile up of inventories and the tightening of bank loans leading to shortage of working capital and capital for long-term investment.

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