

The Impact of Financial Accessibility on Technology Innovation of Vietnamese Enterprises[†]

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Abstract

This paper uses the World Bank 2015 enterprise survey data set, using probit regression and multinomial logit regression to study the relationship between financial accessibility and technology innovation strategy and technological innovation results of Vietnamese enterprises. This article explores the impact of financial accessibility on firms' ability to innovate successfully (including product innovation, process innovation, product and process innovation). Then, determine the impact of financial accessibility on innovation strategies (including internal technology development, external technology development through purchasing or collaborative research with outside institutions or company). Analysis of the data set shows that the difference of Vietnamese enterprises is that they mainly innovate technology through internal research (39.9%), instead of technology from outside; process innovation rather than product innovation. We have found that firms with an overdraft or line of credit to be more innovative. We continue to show that relatively large-scale loans and informal loans does not limit firm's innovation but, in turn, promotes innovation, especially through internal development. Bank loans support process innovation, while loans from family and friends actively support product innovation. Overall, the results of this article show that external finance plays an important role in enhancing the innovation capacities of Vietnamese firms.

Keywords: Vietnamese enterprises, internal development, technology innovation, financial accessibility

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1. Introduction

With the development of globalization and the emergence of industrial revolution 4.0, technological innovation is a very urgent issue for a country and a firm. Therefore, technological innovation has attracted the research interests of many researchers.

Joseph Schumpeter was seen as the first economist to be concerned about the importance of innovation. Accordingly, since the 1930s, Schumpeter has defined five different types of innovation, including: (1) introduction of a new product or a significant change to an existing product; (2) introducing new production methods in an industry; (3) opening up a new market; (4) developing new supply of raw materials and other inputs and (5) organizational innovation (Schumpeter 1934). After that, many studies have been conducted with many different perspectives to supplement and complete more on this issue. By 2005, the OECD introduced the definition of innovation in the Oslo Handbook 2005, which includes four types of innovation: (1) product innovation is the introduction of a new product or significant improvement to its properties or intended use. This includes significant improvements in specifications, components and materials, integrated software, user-friendliness or other functional properties; (2) process innovation is the implementation of new or significantly improved production methods or distribution methods. This includes significant technical, equipment, or software changes; (3) organizational innovation includes implementing a new organizational method in corporate business practices, organizational restructuring or external relations; (4) marketing innovation is the implementation of a new marketing method that involves significant changes in product design or packaging, where product is sold, product promotion or price. The definitions in the 2005 Oslo Handbook are complementary and evolved from the 1997 Oslo Handbook. In which, the product innovation and process innovation in the 2005 Oslo Handbook are similar to the definitions in the 1997 Oslo Handbook, called general is technological innovation (technological product and process innovations – TPP innovations). Similarly, other studies have also distinguished between technological innovation and non-technological innovation. An enterprise is defined as technological innovation if it introduces at least one new, or significantly improved, product or process; A non-tech innovative enterprise is defined as introducing one of the changes in marketing strategy, change in management techniques or organizational structure (Rogers 1998).

The scope of this article focuses on the analysis of technological innovation, which is understood to include product innovation (introducing a new product or having a significant improvement) and process innovation (adopting a new or existing process. significant innovation) and sources of innovation include internal research

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and development and external innovation (including purchasing technology from another organization or enterprise and collaborating on research and development technology).

Innovation is the driving force for the economic development (Rose et al. 2009). Realizing this, many countries around the world have built their own policies to promote innovation. Countries' innovation policies aim at linking science and technology, promoting internal research capabilities, training experts, and drawing out an effective plan for stakeholders to participate. They can compete and benefit from economic activities on the basis of technological innovation. But the innovation processes that underpin technological progress in developing countries move very differently from those in developed countries. Innovation in these countries occurs largely through the absorption, adaptation, and mastery of technologies developed elsewhere, often with foreign origin, rather than the invention of complete technologies (Goedhuys and Veugelers 2012).

Previous studies have shown that technological innovation and bringing technological innovation to market are important elements of enterprise development and advantage of organizational competitiveness (Baldwin 1995; Edwards et al. 2005; Mazzarol 2002; McAdam and Keogh 2004). Technology innovation has become a key factor in ensuring the long-term survival and competitiveness of enterprises in the face of increasingly fierce competition not only in the domestic market but also in the world. (Kim et al. 2019). However, enterprises also encounter many obstacles in the process of implementing the innovation. Factors identified as potential barriers to growth and the adoption of new technologies include legal burdens, organizational quality, financial constraints and macroeconomic uncertainty (Bastos and Nasir 2004; Eifert et al. 2005).

Regarding the impact of finance on firm's innovation, most studies show that access to finance often plays an important role in innovating in most organizations. Having higher access to credit and investment resources increases innovation efficiency, and vice versa. Brancati (2015) states that firms with financial problems have a significantly lower probability of innovation than firms with good financial status, and that financial barriers significantly limit their ability to innovate of the business. Goedhuys and Veugelers (2012) also explores the positive effects of having an overdraft at a formal bank drive corporate technological innovation. Ample financial resources can lead to more successful innovation activities, so innovation finance is increasingly seen as relatively important, and financial constraints are a real constraint to innovation (Lindgaard Christensen 2007). Howell (2016) found that companies that raise more funds are more likely to invest in R&D, which in turn leads to greater success rates of innovation. Meanwhile, Kim (2019) in his research found a relationship between the firm's assessment of the higher degree of financial restriction, the higher the ability for firms to innovate successfully.

Ample financial resources can lead to more successful innovation activities, and financial constraints are the real impediment to innovation. A firms' high financial access involves raising more money, in itself they have stronger resources for more research and development, more patents, and better performance. Financial support has also helped manufacturing firms improve their ability to generate technology innovation results. In addition, such support can increase firms' investment in technology innovation activities (Tello 2015). At the same time, financial constraints have an adverse effect on investment in R&D and innovation (Silva and Carreira 2012), and financial constraints prevent firms from commercializing their research activities, resulting in a lower success rate.

To shed more light on the links between financial access to firms' technological innovation, this article presents micro-evidence from a sample of firms from Vietnam. This article uses data from the World Bank survey of 996 Vietnamese enterprises in 2015, applying probit and multinomial logit methods to explore the impact of finance accessibility on innovation capacity of Vietnamese enterprises, learn about these factors that affect product innovation and process innovation, decide whether to innovate from internal research, external purchase or cooperation research and then propose appropriate recommendations.

The Vietnam analysis allows the case analysis of a rapidly growing low-middle income country where firms have limited capital size but international integration and competition from the outside makes it more and more important to choose an innovative methodology and to successfully introduce new products and processes.

2. Data and Methodology

The article uses survey data from the World Bank, in addition to the dependent variables representing the enterprise's innovation situation and the enterprise's innovation strategy, the explanatory variables are the variables that show the firm's financial accessibility; we select control variables including firm's characteristics, corporate research and development resources to explain the firm's innovation situation and innovation options.

Data source: This paper uses data from the World Bank's "Enterprise Survey (ICS)" conducted by the World Bank in Vietnam 2015. Data collected in Vietnam from November 2014 to April 2016. This data set included 996 businesses surveyed through in-depth interviews with owners and managers of firms. This data set allows to analyze the investment climate conditions of firms. A set of questions were asked about the firm's history, the background of the entrepreneur and manager, the understanding and status of equipment and technology, human resources, financial status and innovation. The ICS data set allows research on product and process innovation.

At the same time, it is possible to learn about options for innovation from self-research, outsourcing or creative research cooperation. More detailed information on samples and sampling procedures can be found in the World Bank's "Enterprise Survey" (2015).

Dependent variables:

Innovation Performance (IP): Introducing new products and / or processes. We use the variable IP to describe performance in creating new products, new processes. There are 4 options for IP variable: In the last 3 years, the firm does not innovate technology, the firm successfully introduces new products, the firm innovates in the production process, the firm introduces successfully both new products and processes.

Innovation strategies (IS): In the questionnaire, firms were asked about key ways to acquire new technology. Contrary to observations in many other developing countries, Vietnamese firms report that an important channel for new technology is internal development, followed by cooperation with suppliers or cooperation with universities and organizations to create new technologies. Acquiring new technology through the purchase of it from outside is less observable. So, we intend to analyze corporate innovation options based on key innovation strategies: there has been no innovation in the last 3 years, firms only develop technology from internal, firms purely buying technology from outside, firms partnering with other organizations or companies to create new technology. However, when doing the Warl and Lr combining test implies that these variables should be combined, so we implement two probit functions to learn the source of innovation from within or from the outside: Internal (worth 1 if public innovation Technology is entirely from internal research and development, 0 for the other case) and External (worth 1 if the business innovates its technology from buying outside or cooperating with another business, 0 for the other case).

Innovation strategy (IS) is modeled on two probit functions and innovation performance (IP) is modeled on a multinomial logit model according to financial accessibility and firm characteristics.

Table 1: Definitions and summary of statistics of variables

Var	Symbol	Definition	Mean	Std.Dev
Dependent variables	IP	y=1: if the firm doesn't have any innovation	2.237	1.284
		y=2: only have product innovation		
		y=3: only have process innovation		
		y=4: have product innovation and process innovation also		
IS	Internal	1: entirely by this establishment; 0: otherwise	0.434	0.016
	External	1: Entirely by another firm or institution or by this establishment in cooperation with another firm or institution; 0: Otherwise	0.120	0.010
Independent variables	overdraft	1: if the firm has an overdraft facility; 0: otherwise	0.124	0.329
	creditline	1: if don't have any line of credit or loan 2: if have a line of credit or loan ≤10 billion Vietnam dong 3: otherwise	1.234	0.550
	access	1: No need for a loan - establishment had sufficient capital 2: Application was approved in full 3: Application was approved in part or application was rejected	1.578	0.655
	lfbank	Percentage of investment value financed by banks and financial institutions	0.192	0.009
	lffriend	Percentage of investment value financed by friends or relatives	0.076	0.006
Control variables	research	1: if during the last 3 years the firm has any formal research or development activities; 0: otherwise	0.223	0.416
	training	1: if during the last 3 years the firm has any formal training activities to staffs; 0: otherwise	0.256	0.436
	size	1: Small (>=5 and <=19); 2: Medium (>=20 and <=99) ;3: Large (>=100)	1.880	0.025
	industry	1: if the firm is a Retail firm or a Services (non-Retail) firm; 0: otherwise (manufacturing firm)	0.688	0.015
	region	1: South East;2: Red River Delta; 3: North Central area and Central coastal area; 4: Mekong River Delta	2.231	1.044

Source: Author's calculations from 2015 survey data

Independent variables: Financial accessibility of the firm: to analyze the financial accessibility of the firm, we approach three groups of variables. First, information from the firm survey includes information about debts and overdrafts: during the fiscal year, whether or not the firm has an overdraft limit for the year, the firm has a credit line or a loan from a financial institution. At the same time the value of loans is also investigated. Therefore, we use the variable overdraft with the value = 1 when the enterprise has a credit limit and 0 for the other case, the

credit line variable = 1, 2, 3 respectively corresponding to the case where the enterprise does not have Any loan, the loan is ≤10 billion Vietnam Dong, the loan is over 10 billion Vietnam Dong. Second, the survey also provides information on the company's most recent credit loan application status. We have used access variables = 1, 2, 3 for the cases where the firm do not apply credit to organizations because they have sufficient capital, they have registered and provided in full, the firm application but denied in whole or in part. Third, through analyzing the impact of the percentage of formal and informal financed loans on a firm's innovation performance and strategy, we explore the impact of loans from formal sources such as banks and financial institutions, and loans from informal sources such as relatives and friends to firm's innovation choices.

Based on the inheritance of previous studies, we select control variables including the set of firm characteristics (firm size, industry, region...) and variables reflecting R&D activities of the firm (Cerulli and Poti 2008; Mairesse et al. 2005), employee training activities (Abdu and Jibir 2018; Rogers 1998). They are measured through different proxies, shown in Table 1.

Therefore, we estimate the model as follows:

Multinomial Logit Model:

$$\frac{P (IP_i = j)}{P (IP_i = 1)} = \exp(\beta_{1j} + \beta_{2j} \chi_1 \dots + \beta_{kj} \chi_k)$$

Probit Model:

$$P(IS_i = 1) = F(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon_i)$$

In which: X_1, \dots, X_k : are independent variables; $\beta_0, \beta_1, \dots, \beta_k$: is the regression coefficient of the model; k: number of independent variables used in the model; j: different choices of dependent variable.

3. Empirical Results

Innovation performance

Technological innovation includes two forms of product innovation and process innovation. An enterprise that implements either of these two forms of innovation is considered to have technological innovation. Research results show that about 52% of firms implement innovation. In terms of technology innovation, Vietnamese enterprises are more likely to implement process innovation than to do product innovation, among successful innovators only about 10.6% implementing product innovation and 39.5% of businesses only implement process innovation, 49.3% of businesses in the last 3 years implement both product and process innovation.

Before conducting polynomial logit regression, we conduct the mlogtest tests for the suitability of the model, the models (1), (2), (3) all pass LR tests, Wald tests, this shows that the variables used in the model are appropriate (except for the variable size $P > \chi^2$ coefficient does not pass the test). For Hausman tests to test the odds independently of other alternatives, the model does not violate, at the same time the combining test between values of the independent variables also shows that these variables cannot be combined. Thus, it is appropriate to assign values in the dependent variable.

The results of the multinomial logic regression with large Chi-Square coefficient and Sig = 0.000 show that it is safe to reject the hypothesis that the estimated coefficients of the explanatory variables are all zero. Thus, the independent variables are significant in explaining the change in innovation status of Vietnamese enterprises.

The research results show that the ability to access finance has a great influence on the ability of enterprises to innovate technology successfully. Using data from Vietnamese firms, we find that overdraft or debt size are positively correlated with technology innovation. An overdraft reduced the likelihood of no innovation in the past three years by 13.5% and increased the likelihood of introducing both new products and processes by 11.4%. Being accepted to have an overdraft will help enterprises be more flexible in innovation and investment activities. Enterprises with a debt size of over 10 billion VND reduce the possibility of no innovation by 24.9% and increase the ability to innovate products by 7.4% with low statistical significance.

Table 2: Technology innovation status of Vietnamese enterprises

Dependent variables		N	Percentage
IP	Have not any innovation	472	48.02
	Only have product innovation	57	5.8
	Only have process innovation	202	20.55
	Have product innovation and process innovation	252	25.64
IS	Entirely by this establishment	392	39.88
	Entirely by another firm or institution or by this establishment in cooperation with a nother firm or institution	119	12.11
Valid		983	100.0%
Missing		13	
Total		996	

Source: Author's calculations from 2015 survey data

We continue to examine the relationship of firms' financial access and technological innovation by examining the impact of loan fulfillment. The results show that the provision of adequate credit (not fully or partially rejected) according to firms needs reduces the likelihood of firms not innovating by 8.2% and increases the likelihood of successful process innovation 5.4%.

We will continue to explore the impact of external funding sources on innovation. We find that investing in innovation requires firms to acquire external capital. In particular, formal and informal loans are positively associated with innovation. Both investments financed by banks and credit institutions and by family and friends are important resources for the innovation of firms. While bank grants support process innovation (up 13.1%), loans from friends and relatives actively support product innovation (up 6.3%). Results are shown in Table 3.

Innovation strategy:

To innovate, enterprises can choose many methods, which can be through self-research, external purchase or research cooperation. In the case of Vietnam, a large proportion of enterprises innovate technology through internal research but have little choice to buy technology, specifically out of 52% of enterprises announcing technological innovation in last 3 years, 76.7% of enterprises implemented technology innovation by internal development, only 5.5% of enterprises implemented innovation from purchasing external technology, 10% chose to cooperate in research with other parties. In addition to implementing business innovation, the remaining 7.8% of enterprises incorporate forms to implement technological innovation. Most Vietnamese enterprises rarely cooperate with outside enterprises or research facilities in the process of technological innovation of enterprises.

Table 3: Results of the multinomial logit analyses explaining innovation performance. (Marginal effects reported. Standard errors in parentheses.)

Variables	(1)				(2)				(3)						
	IP=1	IP=2	IP=3	IP=4	IP=1	IP=2	IP=3	IP=4	IP=1	IP=2	IP=3	IP=4			
Independent variables	overdraft	-0.135*** (0.043)	0.027 (0.018)	-0.007 (0.041)	0.114*** (0.034)										
	loan	2	-0.052 (0.045)	0.006 (0.023)	0.019 (0.041)	0.027 (0.038)									
		3	-0.249*** (0.067)	0.074* (0.045)	0.089 (0.063)	0.086 (0.058)									
	acce ss	2				-0.082** (0.032)	0.009 (0.018)	0.054* (0.031)	0.019 (0.029)						
		3				-0.060 (0.052)	-0.007 (0.026)	-0.021 (0.046)	0.088* (0.048)						
	lfbank								-0.184*** (0.051)	0.026 (0.027)	0.131*** (0.044)	0.026 (0.044)			
	lffriend								-0.200** (0.078)	0.063** (0.030)	0.071 (0.068)	0.065 (0.061)			
	Control variables	research	-0.339*** (0.041)	-0.003 (0.015)	0.078** (0.033)	0.264*** (0.024)	-0.329*** (0.041)	0.004 (0.016)	0.070** (0.034)	0.255*** (0.024)	-0.356*** (0.042)	0.001 (0.015)	0.076** (0.032)	0.279*** (0.024)	
		train	-0.244*** (0.034)	0.041*** (0.015)	0.081*** (0.030)	0.122*** (0.027)	-0.261*** (0.035)	0.051*** (0.017)	0.073** (0.032)	0.138*** (0.027)	-0.239*** (0.034)	0.038** (0.015)	0.080*** (0.030)	0.121*** (0.026)	
		industry	0.113*** (0.029)	0.020 (0.017)	0.013 (0.029)	0.080*** (0.029)	-0.122*** (0.030)	0.027 (0.020)	0.003 (0.030)	0.093*** (0.031)	-0.120*** (0.028)	0.023 (0.018)	0.018 (0.028)	0.079 (0.028)	
		size	2	-0.011 (0.031)	0.031* (0.017)	0.003 (0.031)	-0.023 (0.030)	-0.027 (0.033)	0.031* (0.018)	0.006 (0.033)	-0.010 (0.032)	-0.019 (0.031)	0.037** (0.016)	-0.005 (0.030)	-0.012 (0.030)
			3	0.017 (0.035)	0.023 (0.017)	0.003 (0.034)	-0.042 (0.031)	-0.020 (0.037)	0.022 (0.018)	0.012 (0.036)	-0.015 (0.033)	-0.010 (0.035)	0.034* (0.018)	-0.004 (0.033)	-0.019 (0.032)
regi on		2	-0.187*** (0.036)	-0.017 (0.023)	0.099*** (0.031)	0.105*** (0.032)	-0.187*** (0.038)	-0.019 (0.025)	0.122*** (0.034)	0.084** (0.033)	-0.181*** (0.035)	-0.018 (0.023)	0.106*** (0.032)	0.092*** (0.031)	
		3	-0.306*** (0.038)	-0.053** (0.021)	0.202*** (0.037)	0.157 (0.036)	-0.298*** (0.041)	-0.062*** (0.023)	0.221*** (0.040)	0.139*** (0.038)	-0.272*** (0.039)	-0.060*** (0.021)	0.185*** (0.037)	0.147*** (0.036)	
		4	-0.064 (0.042)	-0.069*** (0.020)	0.123*** (0.042)	0.009 (0.038)	-0.055 (0.044)	0.055*** (0.020)	0.127*** (0.043)	0.014 (0.041)	-0.036 (0.041)	-0.075*** (0.020)	0.111*** (0.041)	0.000 (0.038)	
Number of obs = 948, LR chi2= 448.81***, Log likelihood = -899.8889, Pseudo R2 = 0.1996				Number of obs = 837, LR chi2= 404.88***, Log likelihood = -798.31827, Pseudo R2 = 0.2023				Number of obs = 958, LR chi2= 449.91***, Log likelihood = -916.84047, Pseudo R2 = 0.1970							

(*Significant at 10%. ** Significant at 5%. *** Significant at 1%.)

Source: Author's

calculations from 2015 survey data

Table 4: Results of the probit analyses explaining firms' Internal and External innovation. (Marginal effects reported. Standard errors in parentheses.)

Variables	Internal			External			
	(1)	(2)	(3)	(1)	(2)	(3)	
Independent variables	overdraft	0.297** (0.137)			0.380*** (0.148)		
	loan	0.026 (0.138)			0.134 (0.160)		
		0.567*** (0.198)			0.187 (0.205)		
	access		0.039 (0.034)			0.022 (0.025)	
			0.061 (0.056)			0.032 (0.042)	
	lfbank			0.126** (0.053)			0.046 (0.037)
	lffriend			0.241*** (0.077)			0.040 (0.052)
Control variables	research	Y	Y	Y	N	Y	
	train	Y	Y	Y	Y	Y	
	industry	Y	Y	Y	N	N	
	size	2	N	N	N	N	
		3	N	N	N	Y	
	region	2	Y	Y	Y	N	
		3	Y	Y	N	N	
	4	N	Y	N	Y	N	
Note: ***, **, *: significant at 1%, 5%, 10% level	N of obs = 949, LR chi2= 233.85***, Log likelihood = -533.13489 Pseudo R2 = 0.1799	N of obs = 838, LR chi2= 199.14***, Log likelihood = -472.95362 Pseudo R2 = 0.1739	N of obs = 959, LR chi2= 228.01***, Log likelihood = -542.55507 Pseudo R2 = 0.1736	N of obs = 949, LR chi2= 46.57***, Log likelihood = -325.16766 Pseudo R2 = 0.0668	N of obs = 838, LR chi2= 42.95***, Log likelihood = -304.32654 Pseudo R2 = 0.0659	N of obs = 959, LR chi2= 43.85***, Log likelihood = -331.78601 Pseudo R2 = 0.0620	

Source: Author's calculations from 2015 survey data

To find out the impact of financial factors on the selection of innovation strategies of Vietnamese enterprises, we analyzed two probit models reflecting innovation strategies from internal research and development (internal) and external innovation strategy: purchasing or collaborating on research with another corporate organization (external). The results showed that an overdraft made the possibilities of innovation from both internal and external research 29.7% and 38% respectively. Acceptance of loans by financial institutions makes enterprises more flexible in investment for development. Enterprises with a debt size of over 10 billion VND dramatically increase the ability to innovate from within. Grants from banks and friends and relatives have a great influence on enterprises' ability to innovate successfully from internal research, where informal loans from friends and relatives have a stronger impact.

The fact that the enterprise is rejected by the credit institution in part or the whole of the applied loan does not affect the enterprise innovation much. This is explained by the high ability to access informal loans from friends and relatives of Vietnamese enterprises, through informal loans, enterprises have a good complement to resources for innovation.

4. Conclusions

The general picture of the current technology innovation situation of Vietnamese enterprises shows that Vietnamese enterprises are still quite limited in technological innovation, the number of enterprises implementing the innovation is relatively low. Process innovation is more common than product innovation in Vietnamese firms. The internal resources of Vietnamese enterprises in technological innovation are still weak, so coordination with external partners such as universities and research facilities are necessary, helping businesses to partially solve their problems in the context of limited resources. However, the situation of cooperation between enterprises and these organizations is limited, most businesses choose to innovate internally. The research results also show that R&D activities and training of human resources have a great influence on the ability of enterprises to renew technology.

Overall, our article shows that access to finance is an important determinant of firm's innovation in Vietnam. Firms with a strong ability to borrow outside capital tend to be more innovative. Furthermore, we show that in addition to formal loans, informal loans also play an important role in driving innovation in firms. Research results show that access to finance will have a significant positive effect on firm's technology innovation, especially stimulating internal research and development. These results reinforce the notion that finance is critical to a firm's innovation, and justify many of the measures and initiatives in place to provide additional financing for firms in Vietnam.

From the research results, we propose the following policy suggestions:

Firstly, promote programs and policies to support enterprises in technological innovation. Regarding the financial problem, especially the funding source for enterprises technology innovation should be focused on expanding. The Government also needs to build support funds, preferential loans for technology innovation projects with feasibility of enterprises to support enterprises with limited financial capacity. In addition, the government also needs to implement preferential policies on borrowing capital for research activities, granting quotas from the state budget to buy high technology and transfer it to enterprises under the preferential treatment such as interest rate support in accordance with the current financial conditions of the enterprises.

Second, enterprises need to be more proactive and flexible in finding financial sources for production and business activities in general and technological innovation in particular. Enterprises need to grasp information about financial support policies of the Government, investors as well as credit institutions in order to raise capital.

Third, enterprises need to invest in R&D activities and pay attention to human resource training efforts. This is an important factor to improve the innovation capacity of enterprises.

Fourth, strengthening links between enterprises and partners, especially universities in human resource training and technology innovation cooperation. Enterprises should actively seek and contact these partners for agreement and cooperation. The coordination between the actors in the innovation system that are universities and enterprises play an important role, so there should be a policy to promote cooperation between universities and enterprises. Governments play an intermediary role in the connection between universities and enterprises by regularly organizing technology fairs, conferences and seminars with the participation of universities and enterprises to more effectively serve the need to connect supply and demand for technology.

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