Print ISSN: 2288-4637 / Online ISSN 2288-4645
doi:10.13106/jafeb.2018.vol5.no1.43

Technology Management and Challenges of Vietnamese Enterprises in the International Market[1]

Nguyen Anh Tuan[2], Nguyen Minh Thanh[3], Tran Thi Loc[4]

Received: October 20, 2017 Revised: November 24, 2017 Accepted: February 20, 2018

Abstract

This research aims to evaluate the current state of technology of enterprises in Vietnam in comparison with several countries in the AEC economic community, thereby to propose several recommendations to Vietnamese enterprises in order able to promote technology innovation activities, create competitiveness with enterprises in the region. Qualitative research methods are used through statistics and comparative descriptions from data collected from various sources: WEF, World Bank, CIEM, General Statistic Office. The study results show that Vietnamese enterprises still have many limitations in technology, originated from their small business scale (capital and labor), the current research capacity is still low, the funding for this activity is not high and the accessibility of the capital is still difficult. According to the Global Competitiveness Index, Vietnam's science and technology indexes are low compared to other AEC-developed countries including the availability of the latest technology; the acquisition of technology at the enterprise level; the capacity of improvement; quality of scientific research organizations..., which shall be a major barrier for Vietnamese enterprises to have to overcome to be able to create the competitiveness when entering the global market. From then on, the authors proposed solutions for two subjects, enterprises and government, to help Vietnamese enterprises to overcome this barrier.

Keywords: Technology Management, Global Competitiveness Index, ASEAN Economic Community, ASEAN, Vietnam.

JEL Classification Codes: O14; O31; O33; L26.

1. Introduction

The enterprises are the subject of the national economy and have an important role in supplying products, goods and services to meet the requirements of socio-economic development of a country and "the standard of living of a country depends on its ability to produce goods and services" (Phi, 2013). In Vietnam, the role of all economic sectors has been identified by the Party and State at the XI National Party Congress: "*To develop diversified forms of ownership, economic sectors, types of enterprises; To protect the legitimate rights and interests of owners of assets under ownership forms and types of enterprises in the economy*."

Over the past 30 years of implementing the reform policy, Vietnam has joined in regional and international organizations such as ASEAN, APEC, WTO, AEC, EAEU, EEA and Asia-European Economic Agreement, and been completing all procedures for participation in the Trans-Pacific Partnership (TPP) Agreement. Deepening our engagement with international financial institutions, countries in the region and the world brings many opportunities and challenges for us, in which, under the enterprise's angle, the increasing of the competitive capacity is very urgent. Vietnam's enterprises have gone through a period of "the closed economy" "subsidized by the state" and the playground has now expanded both in the width and the depth. In the width, it is the size of the regional market (AEC) with more than 600 million inhabitants, the average annual GDP is about $ 2 trillion USD (Ministry of Foreign Affairs, 2017). In the depth, we have to compete with a lot of businesses in the region on many different aspects.

1 This research was funded by University of Economics and Law, Vietnam National University - Ho Chi Minh City, Vietnam, under the grant number CS/2017-07.

2 First Author and Corresponding Author. University of Economics and Law, Vietnam National University - Ho Chi Minh City, Vietnam. [Postal Address: Nguyen Anh Tuan, Office of Scientific Management, University of Economics and Law, Vietnam National University – Ho Chi Minh City, Quarter 3, Linh Xuan Ward, Thu Duc District, Ho Chi Minh City, 70000, Vietnam].
E-mail: tuanna@uel.edu.vn and ovanni2002@gmail.com

3 University of Economics and Law, Vietnam National University - Ho Chi Minh City, Vietnam

4 University of Economics and Law, Vietnam National University - Ho Chi Minh City, Vietnam

In terms of potentials, our businesses are mainly small scale, lack of financial resources, human resource quality, labor productivity is still low; the application of technological advances is limited, there are not many innovative ideas to increase labor productivity and increase the competitiveness of enterprises in the market; If this situation is not being improved, Vietnamese enterprises will not be able to compete with large corporations in the region, which will make the economy to be dependent on stronger countries such as Singapore, Malaysia, Thailand, etc. This is undesirable as we have been deeply integrating into the regional and global economy. In order to avoid this challenge, enterprises are required to be aware of and enhance their competitiveness, in particular to pay a serious attention to the application of technology innovation in a responsible and responsible manner.

The study looks at the current state of enterprise development in Vietnam and assesses the current state of technology, thus providing a number of recommendations to speed up the process of technological innovation in Vietnam, to contribute to enhance competitiveness in the enterprise perspective. The structure of the study, in addition to the introduction and concluding paragraphs, there are (1) theoretical basis; (2) technology innovation at the enterprise level in Vietnam; (3) technological constraints of Vietnam in correlation with some AEC countries; (4) the causes of technological limitations of enterprises in Vietnam; (5) conclusions and recommendations.

2. Theoretical Basis

2.1. Enterprises

The 5th economic principle clearly states: Market is the best way to organize economic activities (Mankiw, 2014). Thus, if the market itself operates, each person providing different products, it will also solve the problem of supply and demand in the economy. However, considering the car production, this is a process that requires a deep specialization and coordination between production processes. Why a car cannot be produced by a group of individuals working independently and contracting when appropriate, rather than hiring a particular automobile manufacturing company? Each person can take on different tasks: the designer, the iron purchaser, the steering wheel producer, the radiator producer... and so on, the work is carried out, coordinated with one another at an agreed fee level.

In principle, a car can be manufactured by independent laborers, upon completion it can be assembled and operated. However, this mode of production is extremely inefficient and costly. With this method, who will be responsible for assigning tasks to each person: who designs, who manufactures the assembly, who assembles etc. and the cost of each job? When there is any change in design, then it has to change all the processes and processes, re-negotiate the price etc. Therefore, the enterprise appeared with the role of direction and there is a way of coordinating between departments and individuals to ensure the goal of maintaining the production and creating the products and using the inputs in a most effective way. Thus, the emergence of the form of business is the inevitable rule and the true function of the business is to save costs by turning the transaction relationship in the market into the assigned relationships, the collaboration within an organization (Phi, 2009).

In addition, in order to explain the reason for the formation of the business, the economic management curriculum (Nguyen, 2005) outlined 3 reasons for forming corporate entities:

Firstly, the economic efficiency of specialized production, mass production.

Secondly, an enterprise as a particular, socially independent, economic entity is a form of demonstration of the principle of centralized democracy in the organization of social production. The independence of enterprises, especially in terms of finance, creates the direct ability to exploit investment resources for production according to market principles.

Thirdly, enterprises are formed to perform the function of managing, organizing, coordinating and supervising inputs to ensure that they are used effectively to meet the expectations of the production owners. In order to perform this function, enterprises must be independent with each other, compete against each other, and rely on appropriate management philosophy to achieve their objectives in the most effective way.

According to the approach of economics, enterprises are first and foremost an economic organization with the function of organizing and using input factors to produce appropriate outputs (Phi, 2009). Demonstrating its active role, by definition, is an independent business unit that decides on income (or turnover) and is entirely responsible for any losses in business (Nguyen, Nguyen, Nguyen, Nguyen, & Do, 2015).

The Constitution of Socialist Republic of Vietnam (2014) also stipulates that enterprises are economic organizations which have their own transactional names, assets and transaction offices and have registered their business according to the provisions of law continuously performing one, several or all stages of the investment process, from production to marketing of goods or provision of services on the market for profit-making purposes. Forms of enterprises

as prescribed include: limited liability companies, joint-stock companies, partnerships and private enterprises.

Thus, in essence, the criteria for identifying enterprises include (Nguyen, 2005):

An enterprise is an economic unit which has the legal person status and has independent rights and obligations, has the legal capacity and act capacity to engage in relevant economic and legal activities.

The business must register the business, is licensed to operate and conduct its business activities in accordance with the regime and procedures of the particular country.

The purpose of the enterprise is to maximize profit (for business enterprise) or to achieve the highest socio-economic efficiency (for some special enterprises in the form of public utility or particular Government regulations).

2.2. The Role of Technology and Innovation in the Development of Enterprises

2.2.1. The concept of technology

According to the United Nations Industrial Development Organization (UNIDO), technology is the application of science to technology by using research results and processing it in a systematic and methodical way (UNIDO, 1979). According to the Economics and Social Commission for Asia – Pacific (ESCAP), technology is the knowledge system of process and technology of processing materials and information (ESCAP, 1989).

In addition, the Vietnamese Dictionary of Science has approached and gathered into six concepts of technology in different approaches: (1) science; (2) technical means; (3) a set of product formulations; (4) parts to ensure production and service; (5) approach from a production perspective to transform inputs into outputs; (6) High-tech is the latest scientific material and organizational structure. Although approaching from a variety of perspectives, it is possible to generalize that technology is the synthesis of methods, tools, and means based on the application of scientific knowledge to production and life to create the products and services to meet the material and spiritual needs of people (Yamashita, 1994).

2.2.2. Technology transfer and improvement

Production technology contributes to creating products, improving the material and spiritual life of people. However, human needs are always infinite, so in order to meet human needs, technology also needs to be renewed. Technological innovation is understood as the process of inventing, developing and marketing new products, processes and new technologies.

Technology innovation is the result of three successive stages: invention- innovation - spreading (commercialization) (Le & Ngo, 2008). At present, in the modern world, "technology innovation is the replacement of existing obsolete equipment with modern equipment, replacing the old production process with newer and more modern production process, more advanced than the processes are being applied, and at the same time, that process is the process of qualitative changes of other elements in technology such as improving the production capacity of employees, innovating the organizational measures to manage the technology elements, processing information to improve or produce new products to meet the increasing demands of consumers" (Le & Ngo, 2008). Therefore, technological innovation consists of two main forms: (1) advanced innovation: improving existing technologies, making it more perfect, while (2) radical innovation is to create truly revolutionary new technologies. Advanced innovation aims to improve and perfect the existing technologies, so it takes less time, cost and risk for the enterprises.

At the same time, radical innovation is about creating new technologies, so to some extent it can be said that it creates a new trend, creates a real competitive edge for the enterprises holding it. While advanced innovation enhances the perfection of old technology, enhances the productivity of laborers, radical innovation can create a new trend in consumption, increase demand for business development and affirm its position in the market. Therefore, if the enterprise has the programs to invest, innovate in technology, it will make the production technology more and more perfect, contribute to improve the product quality.

With variety and high-quality products, enterprises can enhance the attention and appreciation of customers. Since then, technological innovation can help businesses expand their markets not only domestically but internationally. In summary, technology and technological innovation increasingly play an important role in the development of the enterprise, which (1) improves product quality; (2) expand the market share so that it (3) creates competitive advantage over other enterprises in the market. In order to obtain the innovation and advancement in the technology of enterprises, while the enterprises themselves need the investment and innovation, the improvement can also be derived from the spreading impacts of industry organizations. In particular, technology transfer activities are considered as factors that have a decisive influence on the prosperity, speed and efficiency of socio-economic development as well as the quality of life of many countries in the world (Yamashita, 1994).

From a business perspective, it is possible to understand that technology transfer is an activity aimed at introducing

advanced technology into production through the application of scientific research results to production or the application of a technology. Finished from one enterprise to another. It is a technology purchase and an education and training process for the use of acquired technology (Le & Ngo, 2008). Although there are many approaches to technology transfer, there are two following basic contents: (1) There are two parties involved: the transferee and the transferor. Objects are new technologies. (2) Transfer is not just the delivery of tangible assets; it also includes intangibles such as management, education, training of the laborers to capture, use the imported technology proficiently and even adapt, improve its technology.

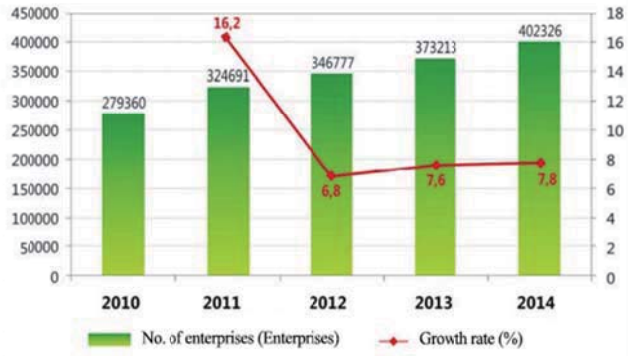
Technology transfer can take two forms: vertical transfer and horizontal transfer. Longitudinal technology transfer is the result of scientific research (which has been completed in the trial production stage, not just in the laboratory) into production. Horizontal technology transfer is the transfer of a piece of technology (from which only well-established products are marketed) from place to place, from one country to another, from one to another enterprises (Le & Ngo, 2008). The objects, as well as the mode of technology transfer are also very plentiful, which can be expressed in many forms: (1) license; (2) production cooperation; (3) technology transfer with basic investment; (4) trade clearing; (5) consulting services; (6) import the technology talent. In addition, technology transfer is carried out at various levels depending on the level of the transferee and the intentions of the parties such as: (1) knowledge transfer; (2) give the key; (3) product delivery; (4) transfer the market.

Therefore, in order to get technological advances, besides the need for businesses to invest and improve internally, they can receive the transfers from outside. These are two basic activities that contribute to the competitiveness of the technology that businesses always need to pay attention to invest in improving their competitiveness, especially in an open economy today.

3. The Status of Technology Management in Vietnamese Enterprises

3.1. Overview of the Development of Vietnamese Enterprises

By December 31, 2014, Vietnam has more than 402 thousand active enterprises, increasing more than 1.4 times from 2010. On average, this year the number of enterprises increased by 9.5% (General Statistics Office, 2016). According to the type of enterprises, there has been a gradual shift towards reducing the share of state-owned enterprises and increasing the share of non-state and foreign-invested enterprises (FDI), as shown in Figure 1 and Table 1.



Source: General Statistics Office (2016), Business results of Vietnamese enterprises in the period 2010-2014 (page 9)

Figure 1. The number and growth rate of Vietnamese enterprises in the period 2010-2014

About the capital scale of enterprises, mainly small and medium enterprises, with the proportion of enterprises with the capital of under 50 billion VND or more, accounting for 93.8% by 2010 and falling to 92.9% by 2014 (*General Statistics Office, 2016)*. Enterprises with a capital of more than VND 50 billion occupied a small proportion, in which the types of state-owned enterprises and FDI enterprises occupied a high proportion (Table 2).

Table 1. Number of enterprises in Vietnam for the period 2009-2014

Type	Number						Proportion (%)					
	2009	2010	2011	2012	2013	2014	2009	2010	2011	2012	2013	2014
State owned enterprises	**3360**	**3281**	**3265**	**3239**	**3199**	**3048**	**1,42**	**1,17**	**1,01**	**0,93**	**0,86**	**0,75**
Centers	1806	1779	1798	1792	1790	1703	0,76	0,64	0,55	0,52	0,48	0,42
Provinces	1554	1502	1467	1447	1409	1345	0,66	0,54	0,45	0,42	0,38	0,33
Non-state owner enterprises	**226676**	**268831**	**312416**	**334562**	**359794**	**388232**	**95,81**	**96,23**	**96,22**	**96,48**	**96,40**	**96,50**
Private companies	47840	48007	48913	48159	49203	49222	20,22	17,18	15,06	13,89	13,18	12,23
Partnerships	69	79	179	312	502	507	0,03	0,03	0,06	0,09	0,13	0,13
Limited liability companies	134407	163978	193281	211069	230640	254952	56,81	58,70	59,53	60,87	61,80	63,37
Joint stock company with the state's capital	1738	1710	1751	1761	1614	1536	0,73	0,61	0,54	0,51	0,43	0,38

Type	Number						Proportion (%)					
	2009	2010	2011	2012	2013	2014	2009	2010	2011	2012	2013	2014
Joint Stock Company without the State's capital	42622	55057	68292	73261	77835	82015	18,02	19,71	21,03	21,13	20,86	20,39
Foreign-invested enterprises (FDI)	6548	7248	9010	8976	10220	11046	2,77	2,59	2,77	2,59	2,74	2,75
100% foreign owned enterprises	5414	5989	7516	7523	8632	9383	2,29	2,14	2,31	2,17	2,31	2,33
Joint ventures with foreign companies	1134	1259	1494	1453	1588	1663	0,48	0,45	0,46	0,42	0,43	0,42
Total	**236584**	**279360**	**324691**	**346777**	**373213**	**402326**	**100**	**100**	**100**	**100**	**100**	

Source: General Statistics Office (2014; 2016), Statistical Yearbook 2014, 2015

Table 2. Scales of Vietnamese enterprises by source of capital

Type	Year 2010				Year 2014			
	Under 5 billion VND	From 5 to 10 billion VND	From 10 to 50 billion VND	Over 50 billion VND	Under 5 billion VND	From 5 to 10 billion VND	From 10 to 50 billion VND	Over 50 billion VND
Total	55,2	19	19,6	6,2	53	18,3	21,6	7,1
1. Classified by the types of enterprises								
State owned enterprises	6,1	7,1	27,1	59,7	4,6	5	24,1	66,2
Non-state owned enterprise	56,8	19,4	19,2	4,7	54,3	18,7	21,3	5,7
FDI enterprises	19,4	10,4	31,2	39	20,1	9,6	29,6	40,7
2. Classified by the production sectors								
Agriculture and fisheries	60,8	12,2	16,2	10,7	53	14,4	20,3	12.4
Industry and construction	48,4	18,7	24	9	43,4	19,5	26,1	11
Services	58,5	19,3	17,4	4,8	57,3	17,9	19,6	5,2

Source: General Statistics Office (2016), Business results of Vietnamese enterprises in the period 2010-2014 (page 19)

Table 3. Scales of Vietnamese enterprises by labors

Type	Year 2010				Year 2014			
	Less than 10 employees	From 10 to 49 employees	From 50 to 199 employees	Over 200 employees	Less than 10 employees	From 10 to 49 employees	From 50 to 199 employees	Over 200 employees
Total	62	28,9	6,5	2,6	67,5	24,9	5,5	2,1
1. Classified by the types of enterprises								
State owned enterprises	2,7	18,7	36,3	42,2	3,2	20,7	36,4	39,7
Non-state owed enterprise	64	29	5,5	1,5	69,3	24,8	4,7	1,2
FDI enterprises	17,5	28,9	28,1	25,5	23,7	29,1	23,5	23,8
2. Classified by the production sectors								
Agriculture and fisheries	29,7	47,9	15,8	6,7	49,2	34,8	11,2	4,8
Industry and construction	42,1	38,8	12,9	6,2	50,3	33,3	11,2	5,2
Services	72,5	23,6	3,2	0,8	75,5	21	2,8	0,7

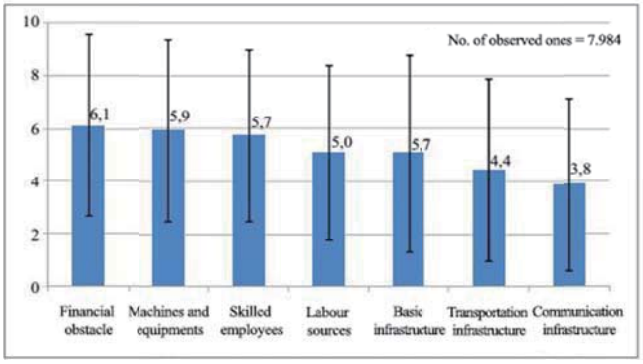
Source: General Statistics Office (2016), Business results of Vietnamese enterprises in the period 2010-2014 (pages 15-16)

On the scale of labor, mainly under 50 employees (accounting for 90.9% in 2010 and up to 92.4% in 2014); Remarkably, SOEs and FDI often have a large scale of employment (over 200 people); manufacturing and service industries with over 200 employees occupy a small proportion to use the following table (Table 3).

3.2. The State of Technology Management in Vietnamese Enterprises

According to the General Statistics Office (2016) survey on the obstacles to business operation of enterprises, the criterion of machinery and equipment is considered as the obstacles ranked second and third only after the financial problem. The figure shows that technology as well as

operation of Vietnamese enterprises are problems that enterprises are facing (Figure 2).



Source: CIEM, DOE, GSO (2014). Firm – level competitiveness and technology in Vietnam evidence from a survey in 2013. Hanoi, Vietnam: Finance Publishing (page 18)

Figure 2. Obstacles to business activities of Vietnamese enterprises

3.2.1. Regarding technology transfer

According to CIEM survey, the origin of technology transfer of enterprises is mainly from domestic enterprises, not from foreign enterprises, as shown in the following table (Table 4).

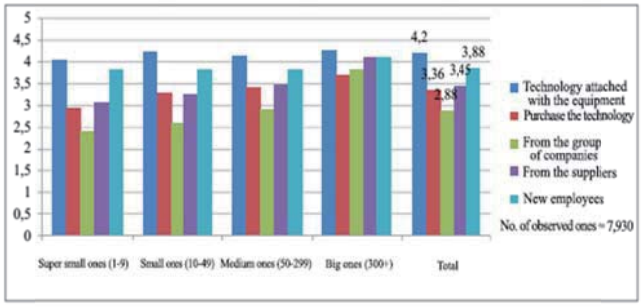
Table 4. Main technology source

Source transfer	Total	Rate
Vietnamese enterprises, same industry	857	10,87
Vietnamese enterprises, other sectors	4355	55,26
Foreign businesses, the same industry	1270	16,12
Foreign enterprises, other sectors	1399	17,75
Total	**7881**	**100**

Source: CIEM, DOE, GSO (2014). Firm – level competitiveness and technology in Vietnam evidence from a survey in 2013. Hanoi, Vietnam: Finance Publishing. (page 23)

This data table shows that among the surveyed enterprises, the main source of technology supply is from domestic and other enterprises, which shows a low degree of internal spreading. In addition to the technology level of Vietnamese enterprises, they are often lower than foreign ones, so the restrictions on technology transfer from foreign firms will likely affect the technology level of the Vietnamese enterprises.

In addition, in the form of technology transfer, enterprises also give the most important assessment of the type of transfer attached to the equipment. In addition, enterprises also pay attention to the role of new employees in the process of technology transfer of their units. The surveyed enterprises assessed the level of transfer with the equipment at 4.2/5 followed by the newly recruited labor force at the level of 3.88/5. This shows the level of high expectations of enterprises in terms of labor qualification, especially quality labor (Figure 3).

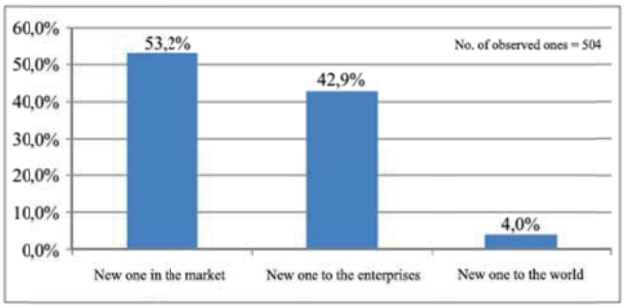


Source: CIEM, DOE, GSO (2014). Firm – level competitiveness and technology in Vietnam evidence from a survey in 2013. Hanoi, Vietnam: Finance Publishing. (page 21)

Figure 3. Assessment of technology transfer channel by scales of enterprise

3.2.2. About technological innovation

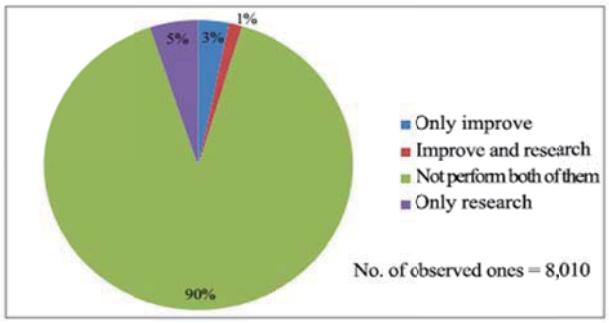
This is an important activity to help enterprises to improve their research capacity. Based on available resources, enterprises can invest in research, improvement and development of technologies that are not yet available in the market. In the CIEM's survey, among the 8,010 surveyed enterprises, only 514 enterprises (accounting for 6.4%) invested in some form of research and development. Among these activities, enterprises rated only 4% of these activities as new ones to the world, while 53.2% rated as new ones to the market, while 42.9% considered that the product research as new ones to the enterprise. Thus, the level of technological innovation of Vietnamese enterprises has mostly stopped at the level of technological innovation available in the product or market, investing in innovation to create innovative activities, or the radical renovation is still being limited, shown in the following figure (Figure 4).



Source: CIEM, DOE, GSO (2014). Firm – level competitiveness and technology in Vietnam evidence from a survey in 2013. Hanoi, Vietnam: Finance Publishing. (page 41)

Figure 4. The novelty of innovative research products in Vietnamese enterprises

Meanwhile, the forms of innovation that enterprises perform mainly only at the research level (with the enterprises that conducted the research). While the level of implementation of both research and innovation activities of enterprises only accounts for a very small proportion of about 1%. Up to 90% of enterprises do not perform these activities (Figure 5).



Source: CIEM, DOE, GSO (2014). Firm – level competitiveness and technology in Vietnam evidence from a survey in 2013. Hanoi, Vietnam: Finance Publishing. (page 44)

Figure 5. Percentage of enterprises implementing technology research and innovation in Vietnam.

4. Technology Management Challenges of Vietnamese Enterprises in AEC countries

To illustrate the competitiveness of Vietnamese enterprises in comparison with several AEC countries, the authors used data on WEF's Global Competitiveness Index (Schwab, 2016), shown in the following table (Table 5).

Among the AEC countries, the index of competitiveness related to technology and innovation of Vietnam is only in medium rate. Vietnam is slightly larger than several other countries such as Cambodia, Laos, East Timor, Myanmar, in the group close to the Philippines but far away from Singapore, Malaysia, Thailand and Indonesia (in this report Brunei does not have enough data to evaluate). In this report, the criteria related to Vietnam's science and technology are almost alarming at the enterprise level, typical of the following criteria:

Table 5. Global Competitiveness Index of Vietnam's Technology Compared to Several AEC Countries

Criteria	Vietnam		Malaysia		Singapore		Thailand		Indonesia	
	Point	Ranking	Point	Ranking	Point	Ranking	Point	Ranking	Point	Ranking
GCI index of 2015-2016 (total 140 countries)	4,3	56	5,23	18	5,68	2	4,64	32	4,52	37
GCI index of 2014-2015 (total 144 countries)	4,2	68	5,2	20	5,6	2	4,7	31	4,6	34
2013-2014 (total 148 countries)	4,2	70	5	24	5,6	2	4,5	37	4,5	38
2012-2013 (total 144 countries)	4,1	75	5,1	25	5,7	3	4,5	38	4,4	50
2011-2012 (total 142 countries)	4,2	65	5,1	25	5,6	2	4,5	39	4,4	46
Criteria for technological availability										
Availability of the latest technology	4	112	5,7	30	6,2	13	4,7	70	4,8	68
Acquisition of technology at the enterprise level	3,9	121	5,6	23	5,7	16	4,9	53	5,1	41
FDI and technology transfer	4,2	81	5,5	5	6	2	4,9	28	4,6	54
Rate of internet users	48,3	73	67,5	45	82	24	34,9	93	17,1	113
Internet bandwidth / 100 people	6,5	79	10,1	68	27,8	23	8,2	73	1,2	106
International internet bandwidth per user	20,7	86	27,2	77	616,5	4	46,8	55	6,2	111
Mobile subscriber bandwidth	31	83	58,3	48	156,1	1	79,9	23	34,7	76
Criteria for improvement										
Capacity of improvement	3,8	81	5,5	7	5,1	19	4,1	54	4,7	30
Quality of scientific research organizations	3,3	95	5,3	20	5,6	12	4	53	4,3	41
Companies invested in R & D	3,3	57	5,3	8	5	11	3,5	45	4,2	24
Cooperation between universities and enterprises in technology transfer	3,3	92	5,3	12	5,6	5	4	45	4,5	30
The level of government procurement of new technology	3,9	28	5,3	3	5	4	3,1	90	4,2	13
Availability of scientists and engineers	3,9	75	5,4	5	5,1	11	4,3	47	4,6	34
Inventions, patents, technical applications / million people	0,2	91	11,6	33	127	14	1,3	66	0,1	102

Source: Schwab (2016), The Global Competitiveness Report 2015-2016.

Firstly, the availability of technology in Vietnamese enterprises was only 4 points, ranking 112th in 140 countries, lower than that of Laos and Cambodia. This shows that the application of technology at the enterprise level is still very limited, we almost still use the backward technology.

Secondly, the acquisition of technology at the enterprise level of Vietnam was 3.9 points, ranking 121st in the world. At AEC only was more than Myanmar and East Timor. This shows that the technology barrier for Vietnamese enterprises is huge and our acquisition capacity derives from the quality of human resources and the available technological resources are not good enough to able to apply the new technology.

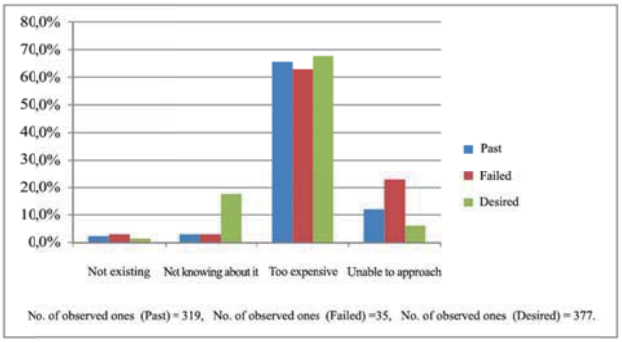
Thirdly, Vietnam's capacity for improvement is only 3.8 points, ranking 81st in the world, just above East Timor, Cambodia and Myanmar.

In addition, other indicators of Vietnam such as (1) the quality of scientific organizations; (2) level of investment in R & D; (3) cooperation between enterprises and universities, research organizations; (4) the level of availability of scientists and engineers; (5) The number of inventions, patents and usefulness of Vietnam in relation to other countries in the region are still limited. Our scores on these criteria are average, with almost no superiority to correlation, while high quality human resources have not yet met the enterprises' needs and technological premises. Therefore, it is necessary to put Vietnamese enterprises in correlative relations with enterprises and corporations in the same region in front of many challenges and difficulties.

5. The Technology Management and Limitations of Vietnamese Enterprises

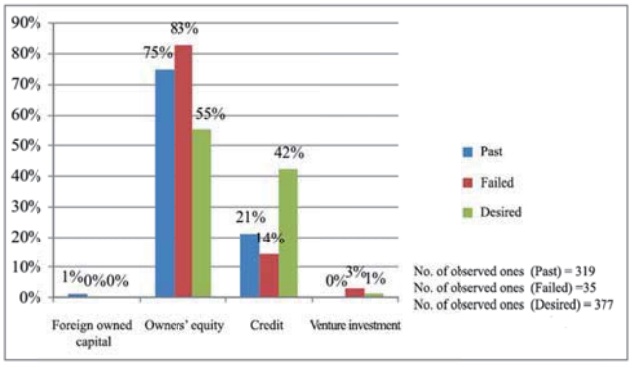
It can be said that Vietnam's entry into the world market, in the immediate future AEC will face a lot of competition, in which the technology factor is becoming a huge barrier to the development, directly affects the competitiveness of enterprises. Main causes of major limitations are:

Firstly, Vietnamese enterprises are mainly small (in terms of capital and labor), low labor productivity (handicraft production), limited technology (compared to other countries in the region and the world - in 2014 is 50.84 million VND/ per person, much lower than other countries in the region such as Thailand, Malaysia ...). In addition, investment in technology of enterprises is limited. This comes from the enterprises' financial problems that have many difficulties; Equity capital is limited to access to high technology; while the accessing with Government incentives is very limited. In addition, businesses are facing many risks when investing in new technology, so they are also very cautious when mobilizing venture capital for this activity (Figure 6 & 7).



Source: CIEM, DOE, GSO (2014). Firm – level competitiveness and technology in Vietnam evidence from a survey in 2013. Hanoi, Vietnam: Finance Publishing. (pp.46-47)

Figure 6. Reasons to improve technology instead of buying technology



Source: CIEM, DOE, GSO (2014). Firm – level competitiveness and technology in Vietnam evidence from a survey in 2013. Hanoi, Vietnam: Finance Publishing. (pp.46-47).

Figure 7. Mobilizing capital for technological innovation

Secondly, the elements outside the business. The average annual bankruptcy rate in Vietnam is high, accounting for 60% of the total number of new enterprises. This shows that Vietnamese enterprises are not oriented towards sustainable development and also show difficulties from (1) competition from competitors in international integration process, (2) Domestic businesses are facing many difficulties. The percentage of bankruptcy enterprises is shown in the table below (Table 6).

Table 6. Number and percentage of bankruptcy enterprises compared to newly registered enterprises

Criteria	Year				
	2011	2012	2013	2014	2015
Bankruptcy enterprises	52739	54261	60767	67823	80858
Newly-established enterprises	77552	69874	76955	74842	94754
The rate of bankruptcy enterprises / newly-established enterprises	68,00	77,66	78,96	90,62	85,33

Source: Ministry of Planning and Investment (2015) and Bao (2015)

Among the components of the GCI, our institution rated at 3.7 / 7; infrastructure rated at 3.8 / 7 and the development of financial markets also rated 3.7 / 7. These are very difficult constraints, inhibiting the development of enterprises. In addition, the ease of doing business index provided by the World Bank (2016) highlighted the difficulties in doing business in Vietnam: the start-up of business (ranked 119/189), the protection of investors (ranked 122/189), tax (ranked 168/189); international trade (ranked 99/189); bankruptcy proceedings (ranked 123/189). The administrative and managerial difficulties have reduced the competitiveness of the economy which made the business of Vietnamese enterprises meet many difficulties. In addition, although Vietnam has made great efforts in institutional reforms on innovation and technology transfer, it is still slow and not synchronous, which does not create conditions for enterprises to access the capital, finance, greatly influencing the development of the business.

6. Recommendations and Conclusions

After more than 30 years of reform performance and the international competition is more and more serious, Vietnamese enterprises are under a lot of pressure in the process of international economic integration from developed countries. Although the development of enterprises has improved in recent years, however, as an emerging market, the majority of Vietnamese enterprises are still being limited in comparison with foreign firms. In terms of scale, technology, access to capital; particularly technological factor that becomes a major barrier to the development of enterprises, because now that it becomes a common market in the region, we will have to compete with very strong corporations from top countries such as Singapore, Malaysia, Thailand etc.

These enterprises are not only strong in financial potential but also very strong in terms of technological ability and creativity. In this stage, technology as well as creativity is a decisive factor in the market's ability to develop. Therefore, in order not to be weak in the process of the globalization, the regionalization that is going on very strong as now, Vietnamese enterprises need to overcome this barrier to create strengths, to compete with other enterprises in the same region. To do this, according to the authors, a number of solutions and recommendations proposed to enterprises and management agencies as follows:

For the enterprises. It is important to focus on the enterprises' sustainable development, not just the wave of start-ups that are happening nowadays. In order to achieve sustainable development, enterprises must emerge from the technological potential, the scientific basis, the advancement and focus on the management matters. Therefore, it is necessary to identify technology as a key factor in determining the competitiveness and development of enterprises in the integration process. Enterprises need to invest properly in research and development and carried out at the enterprises. In addition to radical innovations, which require abundant financial resources and high risk, enterprises can focus on continuous improvement and incrementally improve production efficiency, improve the product, improve the process, renovate models to enhance their competitiveness.

Within the enterprises, attention should be paid to improving the level of staff, especially managers and investment in R & D staff, and encourage employees to contribute to the development of the enterprises through competitions, advocacy programs to mobilize them to improve the quality of activities in the areas of the production process. The current international economic integration process is both a challenge but also an opportunity for Vietnamese enterprises to expand their market. However, to take advantage of opportunities, enterprises need to capture information to be more dynamic in competition with foreign businesses. To do this, enterprises need to focus on marketing, research and market development; collaborate with strategic partners to proactively access technology transfer and improve competitiveness. In addition, the financial problem, especially the funding for research implementation should be focused and expanded by the enterprises. This funding can be extended in many different forms, not just from the owner's equity. However, taking advantage of the support from the Government or investors, enterprises must also have the capacity shown through their research and development results.

For the Government. Together with defining that the enterprises as a driving force for economic development, it should be accompanied by the implementation of supporting policies. Enterprises have difficulty in mobilizing capital in production and accessing new technological advances. Therefore, the Government, besides promulgating support policies, also needs to show concrete activities, closely monitor the implementation of policies to create an equal environment for the enterprises to access capital and disseminate information on new technologies in the world. With the role of directing and creating the working environment, the Government should first create an equal "playing field" on the basis of clear, strict and transparent regulations. To intensify administrative procedures and policies related to business and investment. In addition, as a function of direction, the Government should also provide the necessary support to businesses operating in sectors that need to be encouraged.

Improving the quality of research by scientific organizations as well as training high quality human resources is always the policy and direction of the Government. In recent years, the Government has concretized these policies with specific policies such as autonomy of science and technology organizations, encouraging autonomous and research-oriented universities. However, this policy also needs time to transform, along with the development of resources to ensure that these institutions are strong enough to be autonomous, so in the first period, the government still needs to have appropriate supportive policies, such as focused investments in nationwide high-level scientific organizations, high-tech centers, and the expansion of attracting the research talent from foreign countries (or overseas Vietnamese) to be back to work at universities and research institutions. In addition, it is necessary to build bridges between enterprises and scientific and technological organizations through programs such as the fairs introducing new technology, dissemination of scientific knowledge, etc.

Finally, the Government needs to continue to reform its institutions, perform its macroeconomic management functions: control the inflation, stabilize the exchange rate and interest rates, thus create a favorable environment for enterprises to focus on the production and business, perform well their role in the economic development of the country.

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