SOLUTIONS FOR DEVELOPMENT OF VIETNAMESE ELECTRONICS INDUSTRY IN JOINING IN WORLD TRADE ORGANIZATION

By

Huong, Nguyen Lan

THESIS

Submitted to
KDI School of Public Policy and Management
In partial fulfillment of the requirements
For the degree of

MASTER OF PUBLIC POLICY

2008

SOLUTIONS FOR DEVELOPMENT OF VIETNAMESE ELECTRONICS INDUSTRY IN JOINING IN WORLD TRADE ORGANIZATION

By

Huong, Nguyen Lan

THESIS

Submitted to
KDI School of Public Policy and Management
In partial fulfillment of the requirements
For the degree of
MASTER OF PUBLIC POLICY

2008

Professor Nam, Ill-Chong

SOLUTIONS FOR DEVELOPMENT OF VIETNAMESE ELECTRONICS INDUSTRY IN JOINING IN WORLD TRADE ORGANIZATION

By

Huong, Nguyen Lan

THESIS

Submitted to
KDI School of Public Policy and Management
In partial fulfillment of the requirements
For the degree of
MASTER OF PUBLIC POLICY

Committee in charge:

Professor Il Chong NAM Supervisor _____

Professor Jin PARK _____

Professor Jong Bum KIM _____

Approval as of July , 2008

ABSTRACT

SOLUTIONS FOR DEVELOPMENT OF VIETNAMESE ELECTRONICS INDUSTRY IN JOINING IN WORLD TRADE ORGANIZATION

By

Huong, Nguyen Lan

To many Asian countries, Electronics industry was considered the key industry to promote the industrialization and modernization. Because of the success of these nations in using electronics industry as a level to speed up economic development, Vietnamese government chose electronic industry as the key industry since 1975. However, after 30 years, it is generally supposed that Vietnam electronics industry is weak and its existence is threatened by Vietnam's WTO participation.

However, due to benefits of WTO participation such as more chances to approach capital, technology and global market, joining WTO is indispensable. Thus, it is necessary to analyze Vietnam's electronics industry to find solutions to promote it.

Analyzing developmental trends of global economics, the current situation of Vietnamese electronics industry, the opportunities and challenges after joining WTO indicates that Vietnamese electronics industry is still infant. Except for plentiful labor resource, cheap cost, most internal factors are weaker than those of other Asian countries. External factors like infrastructure, supporting industries, administrative procedures are also weak and ineffectively run. The weaknesses of human resource quality limit the development of both internal factors and external factors.

In general, from the experiences of other countries and analysis of SWOT matrix, the existence and growth of Vietnam electronics industry depend on the

enhancement of many internal and external factors. Among them, enhancement of human resource quality is the most important.

In near future, human resource quality and some other factors can not immediately meet the requirements of development. Thus, Government should try harder to break the barriers to electronics industrial development with simple administrative procedures, improved investing environment, abolishment of monopoly, etc.

Without the changes of internal factors and improvement of external factors, Vietnamese electronics industry is difficult to exist after joining WTO.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

For the past decades, man has witnessed a vigorous development of electronics and information industry. Electronics and information industry became a lever to speed up the economic development of many Asian countries. According to the forecast of predictors and economic specialists, electronics and information industry is still the powerful motivation to create a large change in many fields of the social life in the next decades.

Like other Asian countries, Vietnamese electronics industry was established in 1975, and it has been considered a key industry to promote the development of other industries. However, after 30 years, even the growth speed is 20% to 30%, Vietnamese electronics industry is still evaluated as a weak industry. Many specialists suppose that it is difficult for Vietnamese Electronics industry to exist after Vietnam joined in WTO.

Because of electronics industry's key role in the country's development and comments from mass communication on the future of Vietnamese electronics industry after joining in WTO, the analysis of strengths, weaknesses, opportunities and challenges of Vietnamese electronics industry to bring out solutions to promote its development is very necessary.

The purpose of the thesis

- Analyze the development capacity of Vietnamese electronics industry after Vietnam joined WTO
- Bring out suggestions to support the development of Vietnamese electronics industry after Vietnam's joining WTO

The methodology and strategies for the research

a. Methodology:

First of all, statistical procedures, research papers, expert interviews and books were used to get data. Then, comparative method, qualitative analysis and quantitative analysis were used to evaluate the development of world electronics industry and to identify the current situation of Vietnamese electronics industry. Finally, based on SWOT analysis and experiences in the field of other countries, the thesis presents solutions for Vietnamese electronics industry.

b. Strategies:

Thesis began with an analysis on the particulars of WTO to identify general advantages and disadvantages for membership like Vietnam. Then, it analyzed the status of the world's electronics industry market to find out market division, division of production and to identify which country's policies to be good examples for Vietnamese electronics industry. After that, Vietnamese electronics industry was analyzed and compared with competitors' ones in Asian countries to find out strengths and weaknesses. External factors that influenced Vietnamese electronics industry were also analyzed to find out challenges and opportunities for this industry. To search for more solutions for Vietnamese electronics industry, the researcher also studied experiences from Taiwanese, Korean, Singaporean and Malaysian electronics industry. Finally, the researcher applied the experiences from these countries and SWOT matrix of Vietnamese electronics industry to find out the best solutions for the development of Vietnamese electronics industry.

The organization of the thesis

Introduction:

- The purpose of the thesis
- The methods and the strategies
- The organization of the thesis

Chapter 1: Overview of electronics industry and Vietnam's participation into WTO

1.1 Overview of WTO

1.2 Vietnam's participation into WTO

1.3 Overview of electronics industry

Chapter 2: Vietnamese electronics industry - Current situation

2.1 Internal factors of Vietnamese electronics industry

- History of establishment and development of Vietnamese electronics industry
- Technology levels
- Labor force
- Research and Development
- Capital
- Vision of strategies and levels of management

2.2 External factors of Vietnamese electronics industry

- Participation of Vietnamese electronics industry into WTO
- Trends of development of global electronics industry
- Other external factors (infrastructure, supporting industry, human resource, policy system, capital market)

Chapter 3: Experiences of Korea, Singapore and Malaysia

Chapter 4: Solutions for Vietnamese electronics industry

4.1 Foundation for the solutions

4.2 Solutions for Vietnamese electronics industry (SWOT matrix applied)

Chapter 5: Conclusion

Chapter I

OVERVIEW OF ELECTRONICS INDUSTRY AND VIETNAM'S PARTICIPATION INTO WTO

1.1 OVERVIEW OF WORLD TRADE ORGANIZATION (WTO) [32, p.1-7]

The world Trade Organization came into being in 1995. It is the successor to General Agreement on Tariffs and Trade (GATT) established in the wake of the Second World War.

At the end of 2006, WTO had 149 members, accounting for over 97% of world trade. Around 30 others are now negotiating membership.

1.1.1 The goal of WTO

"WTO ensures trade flow as smoothly, freely, fairly, reciprocally and predictably as possible."

1.1.2 The roles of WTO:

- Administering trade agreement, overseeing, helping members implement their obligations in international trade and enjoying benefits from multilateral agreements
- Acting as a forum for trade negotiations
- Settling trade disputes
- Reviewing national trade policies
- Assisting the developing countries in trade policy issues through technical assistance and training programs
- And cooperating with other international organizations.

1.1.3 The WTO agreements

Because the WTO's rules and agreements were established on the result of negotiation among the members, the WTO agreements have ensured that trade is as fair, and reciprocal as possible.

Through these agreements, WTO members operate a nondiscriminatory trading

system that spells out their rights and their obligations. Each country receives guarantees that its exports will be treated fairly and consistently in other countries' markets. Each member promises to do the same to imports into its own market. The system also gives developing countries some flexibility in implementing their commitments.

In fact, with its goal and activities, WTO creates both opportunities and challenges for the members. To developing countries like Vietnam, with limited advantages, challenges are not insignificant.

We can see clearly opportunities and challenges of joining WTO by analyzing external factors of Vietnam electronics industry in Chapter 3.

1.2 VIETNAM'S PARTICIPATION IN WTO

In the context of globalized economy and realization of advantages and disadvantages of joining WTO of Vietnamese economy, Vietnamese government decided to become a member of WTO.

In January 1995, Vietnam submitted application for joining in WTO.

From 1996 to 2003, Vietnam reformed foreign trade system and economy policies. Vietnam also disclosed these changes to satisfy requirements for WTO joining.

Influenced by economic reforming, the number of FDI projects increased remarkably. While in 8 years from 1988 to 1996, total FDI projects were 1620, in 7 years from 1996-2003, total FDI projects were 3878, and one year from 2004 to 2005, total FDI projects was 1851 [7, p.93].

In 2002, Vietnam began to apply the route of tariff reduction. This route was also applied for electronics products. However, during this time, due to the floor price for imports, Vietnam made a success to limit imports.

Since 2005, when the floor price was taken away, importation has increased remarkably. This has led to a decline in market share of domestic enterprises. We can see this problem in the developmental history of Vietnamese electronics industry.

From January 2007, Vietnam became a full-fledged member of WTO. Vietnam has implemented all commitments of WTO and received all challenges and opportunities as other members of WTO.

1.3 OVERVIEW OF ELECTRONICS INDUSTRY

1.3.1 Roles of electronics industry

For the past decades, human has witnessed a vigorous development of electronics and information industry. Electronics industry has been a lever to speed up the economic development of many countries. For Singapore, electronics was the key contributor to national economy, accounting for 27% of total exports in 2002. In 2002, electrical and electronics products occupied 53% of total exports in Malaysia [5, p.7]. The output of electronics industry accounted for 11.3 % of Korea's GDP in 1992 [34, p.2].

With high intellectual investment, electronics products have promoted science and technology revolution of the world. Thus, electronics industry is considered as a basic industry in modern society, especially in industrialization and modernization. It pushes the automation in industry, optimizes productivity process, rationalizes the use of resources and promotes labor productivity and quality of products.

1.3.2 Characteristics of electronics industry

- *Products*

Because there is a strong competition among enterprises to create new products, the technology in products changes very quickly, and their life cycle is short. The percentage of modern technique and technology increases in the cost of products. Service value of products also increases [3, p.11].

- *Suppliers*

Competition among enterprises for new technology has increased. Thus, Research and Development is more important, and it has become the key factor to the success of a company.

Beside competition, to perfect products, corporations and enterprises have to associate with each other in some fields and some groups of products. Therefore, the global business network is created. For instance: Dram of Samsung (Korea) is present in many products of other multinational corporations.

The United States, Japan focus on research projects; Singapore, Taiwan etc, produce components and semiconductor; Malaysia, Indonesia, Thailand with lower technological levels and lower expenses focus on assembly of products [22, p.1].

- *Consumers*

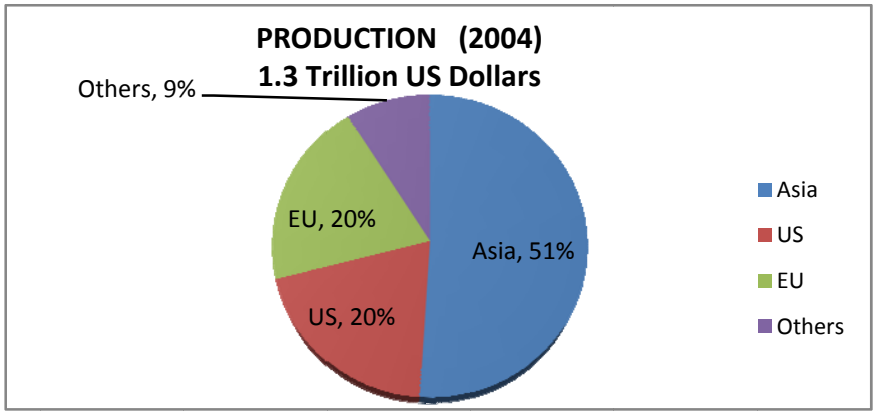
Life style, living standard, culture and education level deeply influence the consumption. Thus, discovering and satisfying customers' demands are the key to success.

Another aspect of consuming electronics products is the role of brand name. Brand name is considered as a quality certificate.

1.3.3 Situation of world electronics industry market

According to Toshimasa ASAKA [23, p.27], recently, Asian countries and regions has been the main suppliers of electronic products in the world. 51% of electronics products were produced in Asian countries. (Figure 1.3.3.1)

Figure 1.3.3.1: **Production of World Electronics Industry**

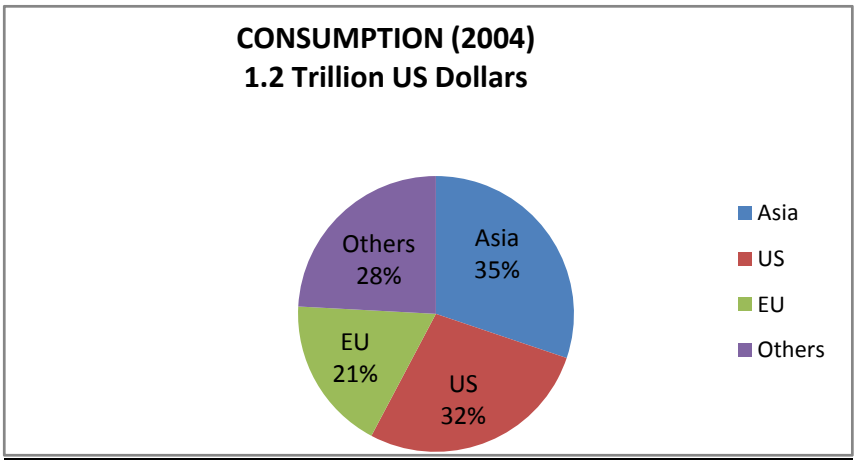


Source: ASAKA, 2005, [23, p.27]

In 2002, Japan with the output value of US$ 20,327,100 million, Republic of Korea with the output value of US$ 5,342,900 million and Singapore with the output value of USD 4,615,700 million were among the top- ten countries producing electronics products. [20, p.6]

While Asian electronics industry produced 51% of products of world electronics industry, it consumed only 35% of total world market (Figure 1.3.3.2). That means approximately 16% of Asian products were consumed by other regions such as US, EU…

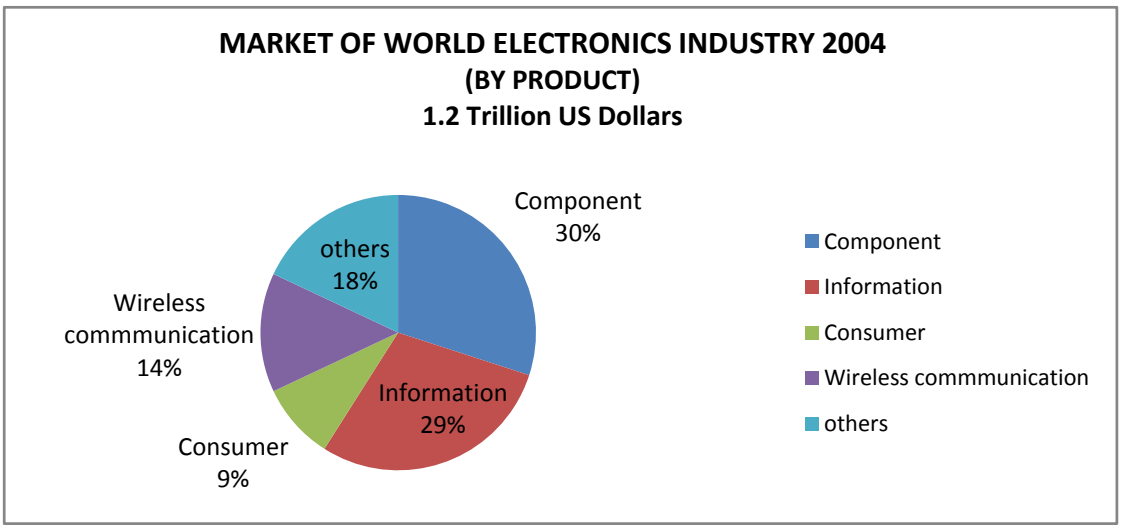
Figure 1.3.3.2: **Consumption of World Electronics Industry**



Source: ASAKA, 2005, [23, p.27]

Research by Toshimasa ASAKA (figure 1.3.3.3) also shows that there was a high demand of information products, component products. The markets of the consumer electronics products and other kinds were smaller.

Figure 1.3.3.3 **Market of World Electronics Industry (by Product) 2004**



Source: ASAKA, 2005, [23, p.27]

The market of information products began to take form in 1980s. From 1985 to 1996, the growth rate of information products increased remarkably, more than 25%. Today, consumption of this product is still developing quickly. However, in Asia, since 2001, the growth rate of information production has reduced, only11%. In 2004, Asian countries' production was only about US$ 133 billion meanwhile consumption of this kind of products is US$ 348 million [23, p.27-30].

As consumer electronics products are concerned, the market share is small and the market demand has been nearly saturated. Japan, Korea, Hong Kong,

Singapore and Malaysia are among the leading producers of consumer electronics products [20, p.6]. However, the United States, Japan and Germany are the biggest consumers. This information was summarized in Table 1.3.3

Table 1.3.3 **Consumption of consumer electronics products**

Unit: million pieces

Countries	Population	Radio	Television	% radio per people	% Television per people
Germany	83,029,536	77,800,000	51,400,000	**0.94**	**0.62**
France	59,551,227	55,300,000	34,800,000	0.93	0.58
Japan	126,771,662	120,500,000	86,500,000	**0.95**	**0.68**
United State	278,058,881	575,000,000	219,000,000	**2.07**	**0.79**
China	1,273,111,290	417,000,000	400,000,000	0.33	0.31
Malaysia	22,229,040	10,900,000	10,800,000	0.49	0.49
Indonesia	228,437,870	31,500,000	13,750,000	0.14	0.06
Singapore	4,300,419	2,600,000	1,330,000	0.60	0.31
Vietnam	77,658,595	8,200,000	4,020,000	0.11	0.05
Thailand	61,797,751	13,960,000	15,190,000	0.23	0.25

Source: Doan Viet Hai, 2001, [*3, p.7*]

Regarding component products, the market had been increasing. In 2002, Korean played the leading role in the world DRAM market. Singapore also became one of the leaders producing hard disks. Taiwanese became the fourth producer of semiconductor of the world, just behind of USA, Japan, and Korea [20, p.11-12]. In consumption, according to Zentraverbank Elektrotechnik and Electronics Industries - ZEEI, (Biki, N: 19, 2000), the United States accounted for 31,7% and Japan 27% of total global consumption, so they are the biggest consumers of semiconductors.

SUMMARY

Studying the overview of electronics industry and process of Vietnam's joining WTO indicates that because electronics industry plays the key role in economic development of many countries, studying Vietnamese electronics industry in joining WTO is very important. To develop, Vietnamese electronics industry has to face with a high speed of technological development, an increase of service quality, a fierce competition with international enterprises, the division of production, and the requirement for brand names.

The overview of electronics industry also shows that Asian countries have a lot of advantages in electronics industry's development. They are the biggest producers. Their strengths are producing electronics components and consumer products. However, in the field of information electronics, that has quick development

and takes the second largest market share, production of Asian countries has increased only slightly. So, Asian producers should need more attention to this field.

Studying the world's electronics industry also shows that it is necessary to study the cases of Korea, Singapore, and Malaysia. The rapid development of these nations in consumer electronics and semiconductor electronics is a precious example for Vietnamese electronics industry.

Chapter II

VIETNAMESE ELECTRONICS INDUSTRY- CURRENT SITUATION

2.1 INTERNAL FACTORS OF VIETNAMESE ELECTRONICS INDUSTRY

2.1.1 History of establishment and development of Vietnamese electronics industry

Although Vietnam was a poor agricultural country, it had plentiful labor force famous for their nimble fingers and inquiring mind. Wishing and striving to become an industrial country, Vietnam made electronics industry a key industry to promote the country's industrialization and modernization. Thus, in Oct 1970, Department of Electronics Research belonging to Ministry of Industry was established.

By the end of 1975, Vietnam had only two electronics enterprises. Both of them were assembly enterprises. More than 10 years later (1985), according to the establishment of Vietnamese Electronics and Informatics Corporation in 1980 and the effect of "*doi moi*" (renewal) process, 715 enterprises participated in electronics industry [6, p.434]. 95% of these enterprises assembled television, radio cassette recorders, VCD and DVD from parts imported under CKD, SKD, and IKD forms. Most of them were state companies [22].

Since 1996, influenced by the process of joining WTO, the number of joint venture enterprises increased. However, under the pressure of competition from joint venture enterprises, domestic enterprises with backward technology could not satisfy the market demands on price and quality. Thus, the number of domestic enterprises reduced remarkably. At the end 1997, Vietnamese electronics industry had only 133 enterprises with 12105 employees [6, p.471].

From 2002, to prepare for joining WTO, Vietnam’s economy was open larger to foreign companies (i.e. with 100% foreign capital) and implemented the route of reducing trade barriers. Due to the open economy and the more favorable conditions for foreign investment environment, ten joint venture enterprises were transformed to foreign ones contributing to the increasing number of foreign enterprises in Vietnam electronics industry.

With the growth of FDI enterprises, by the end of 2004, Vietnam had 365 electronics enterprises with 29,437 employees. [6, p.434, p.471]

With more capital and new technology, FDI enterprises played the leading role in consumer electronics (Table 2.1.1 and figure 2.1.1)

Although Vietnamese consumer electronics had an average growth of 24% per year, the output from state sector increased only 1% to 11% (table 2.1.1). In addition, from 2003 to 2005, the output of the state sector reduced remarkably for all types of products: 10% of television assembling, 16% of video assembling. Especially, radio cassettes were no longer assembled by the state sector. By the end of 2005, the output of this sector was only 8% of total output of Vietnam consumer electronics (Figure 2.1.1). According to the annual report of Vietnam Electronics Informatics Corporation 2005, "meanwhile consumer electronics market increased 20%-25%, market share of Vietnam electronics Corporation reduced from 16-18% in 2002 to 4-6% in 2004".

On the other hand, there was an incredible growth in the non state sector's output: 221% of television assembling and 973% of video assembling (table 2.1.1)**.** As having neat organizational structure, this sector easily changed the assembly lines to meet the market demands. By employing workers without high qualifications and using input without brand names, this sector could decrease the cost of products. Their products could satisfy the demand of low income citizens or those living in rural areas. Obviously, development capacity of the non state sector was very high. However, the output of this sector was still very small, only 6% of total output of Vietnamese consumer electronics (Figure 2.1.1); in addition, reduction (16%) of video assembling from 2003 to 2005 indicated that this development was unstable**.**

The output of the foreign invested sector increased significantly: 20% for video assembling, 25% for television assembling. Its role in Vietnam consumer electronics was affirmed when it had 86% of total output (Figure 2.1.1).

In component electronics, state sector and non state sector also showed the weakness. The number of domestic enterprises that produced this kind of products was limited. Most of them were unknown. Only VTR Binh Hoa and VTR Thu Duc Co were known with the production limited to simple parts as Choke coil, DY coil, SMT, etc. with total output value of US $16.1 million in 2005 [29].

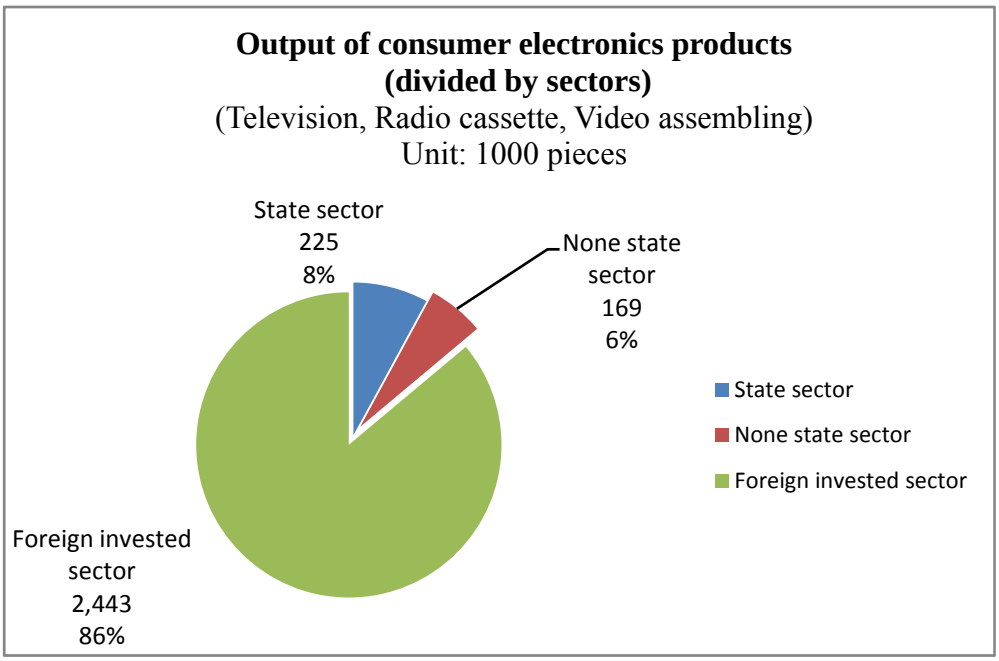
Table 2.1.1 **Output of consumer electronics products (divided by sectors)**

Unit: 1000 pieces

Product	Sector	2001	2002	2003	2004	2005	Annual Growth rate (2003-2005)	Annual growth rate (2001-2005)
Television assembling	State sector	176.5	179.2	217.8	189.7	178.1	0.90	101%
	Non state sector			16.4	141.7	139.3	4.81	321%
	Foreign invested sector	949.1	1418.1	1953.6	2328.3	**2197.9**	1.07	125%
Radio cassette assembling	State sector	54.8	46.8	0	0	0		0%
	Foreign invested sector	16.6	20.5	23.6	24	**24.9**	1.03	111%
Video assembling	State sector	38.7	52.4	72.6	42.7	46.9	0.84	111%
	Non state sector	7.99	1.2	49.3	25.4	29.7	0.84	1073%
	Foreign invested sector	16.4	30.2	128.2	217.1	**220.08**	1.35	220%
Total output of all sectors		**1260.09**	**1748.4**	**2461.5**	**2968.9**	**2836.88**	1.08	**124%**

Source: General statistics offices, 2006, [6, p.334-335]

Figure 2.1.1: **Output of consumer electronics products**



Source: calculated from figures of Table 2.1.1

The weakness of Vietnamese electronics production became clearer when we know that:

- In 2005, the export value of Vietnam electronics industry was US$ 1,427.4 million, but import value reached US$ 1,706.5 [7, p.429-432].

- More than 95% of export value was made by FDI enterprises like Fujitsu, Hariki Precision, Insytek, SamSung Vina, etc. [28, p.23].

- Most of electronics products had foreign brand names. There were several domestic names like VTB, Belco, but 90% parts of these products were imported from foreign countries [24, p.7].

In general, the growth rate from 2001-2005 of private sector indicated that developmental potential of this sector was high. However, due to holding a small market share and unstable development of the state sector and the private sector, domestic electronics industry was weak. Even in domestics market, it had only a small market share and its market share is being narrowed by the domination of FDI enterprises in joining WTO.

2.1.2 Technology levels

According to a report in 5/2006 by Mr. Tran Quang Hung, Secretary General of Vietnam Electronics Association in Tuoitre newspaper, technology and equipment of Vietnam electronics industry was 10 to 20 years backward as compared with other

Asian countries like Thailand, Philippines and Indonesia. While Singapore, Taiwan, Korea was in the third stage (researching and developing products, investing in high technology, and increasing export), Vietnam was still in the first stage (assembling electronics products from imported parts) and was preparing to reach the second stage (investing in manufacturing parts and components).

This situation was also obvious as 77.7% of domestic enterprises had investing capital under US$ 625 thousand. Fixed assets per labor in domestic electronics industry were US$ 5,200/person. [6, p.522 - 471]

According to the World Economics Forum in 2001, the technological level of a nation was evaluated on the association with many elements such as total expenditure for R&D, creativity in science, and technology, and the system of technological development. According to this evaluation, Vietnam was ranked under average.

Table 2.1.2 **Technological capacity of Nation**

Country	Number of technical specialists/100,000 people	Number patent/ million people	High technological product / total exported product
Vietnam	**61**	**0.09**	**8.2**
China	454	1	39.9
Singapore	2318	8	74.9
Indonesia	182	-	17.9
Malaysia	93	-	67.4
Philippine	157	-	32.8
Thai Land	103	1	48.9

Source: UNDP, 2001, [quoted from 16, p.32]

Although recognizing their backwardness in technology, domestic enterprises had no capital and plan to buy new technology. For domestic enterprises, purchasing new technology in this stage seemed very risky. They could not predict their future and definite the trend of development of electronics industry when Vietnam joined WTO.

Vietnam electronics industry received FDI from 1989, but why was its technological level still too low? Wasn't there any technological transfer from foreign countries since 1989?

Before 2000, Vietnam's economy was nearly a closed economy. The exchange of goods and technology was rather limited. Demand for high-tech level was still low, but the demand for electronics products was high (Vietnam was a populous country

with the population of more than 70 million people at that time). Thus, to foreign enterprises, transferring old technology or assembly line was a perfect strategy to escape the tariff and to reduce expenditure when penetrating into the local market. To domestic companies, with the limited capital, inexperience in purchasing machines and lack of information on new technology, they had to be satisfied with technological transfer from foreign companies.

In that situation, in 2003, 80% consumer electronics products were assembled in CKD form, 20 % consumer electronics products were assembled in SKD or IKD (Report of Institute of research strategies and industry policy, 2003).

Since 2000, together with more and more participation of foreign companies, the issue of regulations of technological transfer, the improvement of knowledge by development of worldwide communication, and the trend of integration into global economy created a new technological flow. However, to domestic enterprises, facing with the new challenges from WTO accession, they dare not spend huge capital investing in new technology.

In general, influenced by the lack of capital and predicable ability, technological capacity of Vietnamese electronics industry is rather backward.

2.1.3 Labor force

In 2004, total employees in electronics industry were 29,437 people. 59% employees worked for domestic companies, 41% worked for FDI enterprises [29].

Now Vietnam has nearly 30 universities and 100 technical schools that train students majoring in electronics. These institutions supply plentiful skilled workers and engineers for the labor market. However, this has only satisfied the demand in quantity of Vietnamese primitive electronics industry. Due to the old educational system, professional capacity and English level of these engineers and skilled workers are rather limited. Thus, "Survey of the labor environment in Asia, China, India" of Japan External trade Organization Oct 2006 implied that Vietnam electronics still lacked high level labor for stable development.

In addition, there is a remarkable difference between employees working for domestic enterprises and those working for FDI enterprises in professional ability.

In 2005, in domestic enterprises, the average monthly salary was 100 USD [29]. In the FDI enterprises, workers received 1.5 to 2 times as much salary as those working in domestic companies. Engineers and skilled workers in FDI companies even received far higher salary than their counterparts in domestic ones: 3 to 6 times.

With high salary, perfect working environment that stimulated creativeness, improving professional skills and offering chances to study and to work in developed

countries, FDI enterprises attracted the best employees. According to investigation of Ministry of Labor in 2000, 53% of bachelors with the excellent graduation hope to work for FDI enterprise, and 64% of skilful workers working for state enterprises hope to work for FDI enterprise [3, p.19].

These figures also suggested that national spirit of young generation was weak. This is a threat not only for the development of domestic electronics industry but also for other industries.

In general, the labor in Vietnam electronics industry is plentiful. However, due to the old educational system, the professional capacity and English level of Vietnamese engineers and skilled workers are limited. The nationalism of the young generation is not strong. This leads to the lack of high level labor for stable development of domestic electronics industry.

2.1.4 Research and development

Table 2.1.4.1 **Expenditure on R&D**

Unit: US$ million

Countries	GDP 2004	Expenditure for R&D per GDP 1996-2003	Expenditure R&D 2004	Scientific and technical journal article
Vietnam	45,210	..	..	158
Korea	679,674	2.64	1,794,339	11,037
Singapore	106,818	2.15	229,659	2,603
Indonesia	257,614	..	..	207
Malaysia	118,318	0.69	81,639	494
Philippine	84,567	..	..	158
Thai Land	161,688	0.21	33,954	727

Source: World Bank, 2006, [21, p.20-22, 306-308]

Table 2.1.4.1 shows that before 2004 the budget for R&D per year of Vietnam was rather limited.

Table 2.1.4.2

Government support for electronics - especially R&D support

	India	Indonesia	Malaysia	Philippine	Singapore	Thailand	Vietnam
Active promotion by government agency	Yes	-	Yes	-	-	-	-
Engagement in tax exemption or	-	-	-	-	Yes	Yes	-

structure reform							
Direct government investment	Yes	-	Yes	-	Yes	-	-

Source: Fusion Consulting, 2005, [5, p.5]

Table 2.1.4.2, once again, indicates that most nations that have developed electronics have paid much attention to R&D. They used different methods to support R&D and they were all successful.

However, Vietnamese government had no special policy to encourage R&D in electronics industry.

The situation is the same in domestic enterprises. In Annual Report and Financial Report of Vietnam Electronics Informatics Corporation, the leader of domestic electronics enterprises, there was no expenditure for R&D from 2001 to 2005.

Why didn't government and enterprises pay attention to R&D although it was the key to success?

In fact, before 2003, the government and enterprises supposed that research and development in electronics needed huge capital, high professionalism and high inheritance. So R&D was beyond Vietnamese electronics industry's reach. In addition, Vietnam was a newcomer in this area, so Vietnam should take advantage of R&D achievement of previous comers.

Recently, the concept of R&D has been changed. Decrees in 2003 (23/2003/ Decree Government and 27/2003/ Decree Government) indicates that the government has paid more attention to R&D. For example, an R&D project can be charged only 10% income tax, and it enjoys supported land as well as exemption of import duty for laboratory equipments. However, up to now R&D of electronics industry has received no government's direct investments and support from Government's R&D agency (Vietnamese government has had no agency that has enough capacity to support R&D in electronics industry). The complication of customs procedure and unclear administrative procedures are also becoming barriers to Government's effort. That is the answer to the question why the government issued some R&D stimulating polices since 2003, but in 2005, Fusion Consulting evaluated that Vietnamese government had no policies supporting R&D (table 2.1.4.2).

In general, Vietnam government did not pay enough attention to R&D to create the powerful motivation to attract R&D investment from enterprises. The government did not invest directly in R&D or establish capable government agencies to promote private sector's R&D. The concept that "Vietnam should take advantage of R&D achievements of previous comers" has been too popular. Inconvenient and

unclear administrative procedures have been also barriers to R&D investment.

2.1.5 Capital

Table 2.1.5 **The situation of total capital in electronics industry**

Form of enterprise	Total capital (US$ million)	%
Domestic enterprise	56.5	6
Joint venture enterprise	491.8	49
Foreign enterprise	448.2	45
Total	**996.5**	**100**

Source: Vietnam Electronics Informatics Corporation, 2001, [29]

Although there were more than 200 domestic enterprises (50% of total electronics enterprises), their capital was only 6% of total capital of Vietnam electronics industry (table 2.1.5). Of the US$ 56.5 million of domestic enterprises, US$ 29.6 million belonged to eleven members of Vietnam Electronics Informatics Corporation [29]. That means the average total capital of the other domestic enterprises was only US$ 0.142 million. This indicates that the capital of domestic electronics enterprises was very low.

Since 2003, the situation has become worse to the state enterprises when the annual return on assets (ROA) of eleven biggest domestic companies from 2003 to 2005 was very low (from 2%/year to 6%/year) (table 2.1.6), lower than the loan interest rates of banks (10% /year). How could they increase the capital with ROA like that?

By capacity of full up hole of market (supply of cheap products), private enterprises mobilized capital of Vietnamese overseas and leisure money from Vietnamese citizens. Their capital has increased recently. However, the capital per enterprise is still very low [22, p.24].

According to Annual Report 2005 of Vietnam Electronics Informatics Corporation, 67% of the investment was saved for consumer electronics. Producing components that was very important for developing electronics industry was invested only 21.5%. The structure of invested capital indicated a lack of a well-based foundation and balance of Vietnamese electronics industry. However, this was also the common situation of developing countries in the first step of electronics industry.

In general, the capital of Vietnamese electronics industry is very small, and it has become narrow due to ineffective business. The imbalance between in component production and consumer electronics production is high. It may lead to underdevelopment of Vietnam electronics industry in future.

2.1.6 Internal Efficiency of Firm in the Sector

The development of Vietnamese electronics in 30 years displayed the weakness in vision of strategies and management level.

Below is some discussion on the profit of eleven biggest domestic companies, all of which belong to Vietnam Electronics and Informatics Corporation.

Table 2.1.6.1

Productivity effects of eleven biggest domestic electronics enterprises

Unit: US$ million

	2003	2004	2005
Total assets	42.59	62.37	64.24
Net income	2.58	1.35	3.06
ROA (return on assets)	0.06	0.02	0.05

Source: The balance sheet and income statement of Vietnam electronics and Informatics Corporation, 2003- 2005, [29]

ROA reflects the profit created by one unit of asset. ROA indicates not only financial effects but also social effects of a business. However, ROA of eleven biggest domestic enterprises was very low, lower than the loan interest rate of banks or Vietnam's inflation rate. The situation was even more serious as the turnover structure of Vietnam Electronics and Informatics Corporation was concerned. More than US$ million 2.8 of the total turnover in 2005 was from renting real estate or financial business.

It can be inferred from the case of eleven biggest domestic electronics companies that the vision strategy and management level of most domestics companies were very weak. This was also affirmed by WTO in table 2.1.6.2.

Table 2.1.6.2 T**he rank of enterprises' strategies**

Country	2004 (104 countries)	2005 (116 countries)
Vietnam	**81**	**81**
China	39	53
Thailand	36	35
Malaysia	28	24
India	30	30

Source: World Economic Forum (WEF), 2006, [quoted from 25, p.6]

In conclusion, the vision of strategies and the management levels of the domestic sector, especially the state sector, of electronics industry are very weak.

2.2 EXTERNAL FACTORS OF VIETNAMESE ELECTRONICS INDUSTRY

2.2.1 Participation of Vietnamese electronics industry into WTO:

Participation to WTO is an indispensable trend to develop a country's economy. So in 1995 Vietnam applied to join WTO and in January 2007 Vietnam became a member of WTO.

By the WTO's guarantee for fair treatment in import and export, Vietnamese electronics industry has chances to expand its market to other nations and has more chances to choose technology, and materials, etc. with good price. This guarantee also intensifies the competition between electronics enterprises and thus reformation in Vietnamese electronics enterprises can be sped up. The better organizational methods will be found out and applied by these enterprises. Together with the agreement above, to meet the requirements of WTO, Vietnam has to reform economic institution. That makes business environment more perfect. Foreign investment and domestic investment for economic and education increases. That creates more chances for Vietnamese electronics industry to approach source of capital, technology, and experience in management from other nations [26, p.104-105], [32, p.3-12].

However, joining WTO leads to several main challenges for Vietnamese electronics industry, such as the Vietnamese electronics industry will lose its market share, even its domestic market if its productivity is not strong enough; brain drain in domestics electronics industry will increase when high level labor determines working for FDI enterprises or working abroad. This is the situation of Vietnamese electronics industry today.

However, opportunities and challenges always come together. The challenges in this field may be opportunities for development in other fields. Manipulating opportunities and advantages can create lever to overcome challenges and create new, greater opportunities. If not, challenges will increase, and they will become long term problems.

2.2.2 Trends of development of global electronics industry

Due to globalization, the market has expanded. Competition between enterprises does not rely on protective policies and preferential treatment of a nation. Technology, quality, services, price and promotion policies become the keys to successful competition.

Competition and corporation go abreast. To create new products with more competitive advantages, co-ordination in finance, technology and relationship becomes necessary. This explains the presence of Korean and Taiwanese semiconductors in products of European and United State multinational enterprises.

Developed countries not only focus on research and development of new products but also semiconductor production. Developing countries with plentiful labor resource receive transferred technology from developed countries, import components for production, and then export completed products [3, p.5].

Border between electronics products, informatics products and telecommunication products becomes unclear because electronics, informatics, and telecommunication are included in modern products [3, p.6].

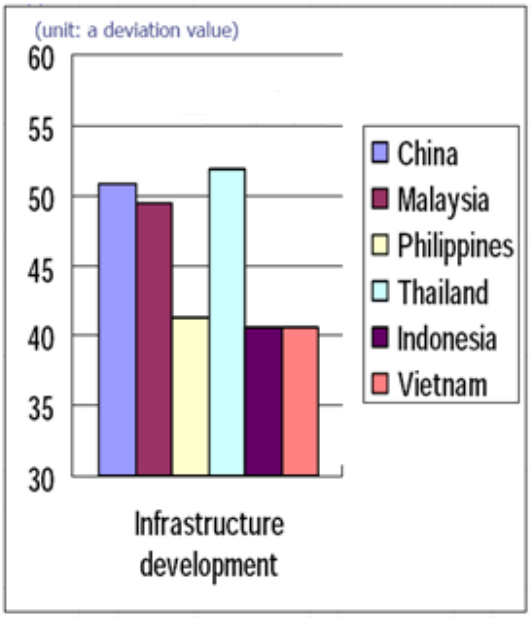
2.2.3 Other exterior factors of Vietnamese electronics industry

- *Infrastructure*

Vietnam is an agricultural country. After centuries of wars, Vietnam was in the stage of command economy. The monopoly limited developmental capacity of many areas. Today, thanks to opening policies, competition in Vietnam is increasing. However, in some areas such as telecommunication, water supply, electricity supply, Vietnam government still maintains monopoly. Lack of competitive pressure and Government's attention has led to slow development of infrastructure.

Figure 2.2.3.1

Infrastructure development of Asian Countries



Source: Jetro, 2006, [12, p.2]

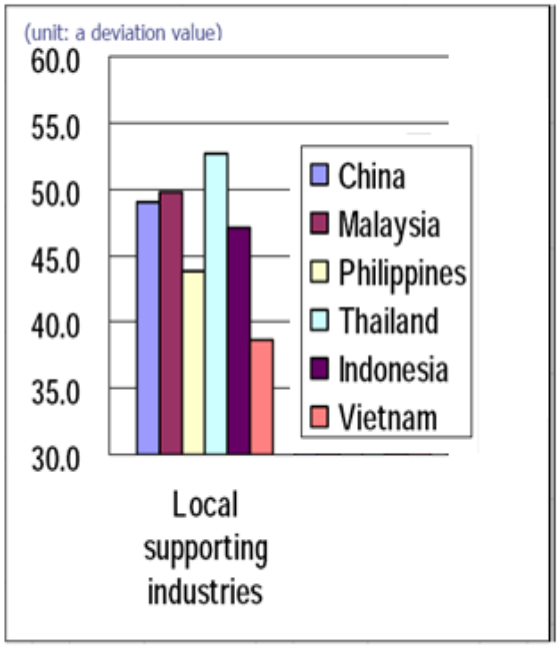
According to the evaluation of Jetro in 2006 [12, p.12], Vietnam's infrastructure development was in the lowest group as compared with other countries like China, Malaysia, Philippines, Thailand, (see figure 2.2.3.1). For example, the cost for calling from Vietnam to Japan was four times as expensive as that of Thailand and Singapore to Japan and the price of electricity was twice as expensive as that of Malaysia, Thailand, Philippine. The cost of Vietnam's transportation is the most expensive in Southeast Asia, e.g. 1.4 times as compared with Malaysia, Indonesia, and 1.85 times as compared with Singapore [16, p. 34].

Because of low technological level, the quality of infrastructure is low.

In general, the Vietnam infrastructure is very weak because of the lack of competitive pressure and government's attention.

Figure 2.2.3.2

Local supporting industries in Asian countries



Source: Jetro, 2006,[12, p.2]

- *Supporting industries*

In electronics industry, input mainly depends on supporting industries. However, Vietnam supporting industries are very weak.

According to VEISA, in 2005, "meanwhile FDI enterprises try to find out domestic suppliers of input materials, the suppliers can not satisfy the demand of quality, price and delivery date. Thus, Fujitsu Co, the company with exported value of a half million US$, have to import 100% material to produce. Canon could not find out even a screw with international standard produced in Vietnam" [28, p.30]

Recently, the appearance of some FDI enterprises in supporting industries contributes to alter the situation, but in general, with limited orders of domestic enterprises, Vietnamese electronics industry has to accept a re-supply of electronics material at a high price.

In general, among Asian countries like China, Malaysia, Philippines, Thailand and Indonesia, Vietnam supporting industries are rather young. Recently, they have been improved with the joining of FDI enterprises. However, the effects are still limited. This is illustrated in Figure 2.2.3.2.

- *Human resource*

Vietnam has a plentiful labor resource as compared with other countries. Its population is 82.6 million, 13th in the world. Its labor force was 43 million in 2004, and was estimated to be 55 million in 2010.

According to World Development Indicators of 2006, Vietnamese average labor cost in manufacturing per year was US$ 771 per person. This was the lowest in the region especially when working time was concerned. (Table 2.2.3.1)

Table 2.2.3.1 **Labor cost and working hours in Asian countries**

Countries	Labor cost in manufacturing In 1999 (US$)	Working hours/ week 1999
China	729	-
Indonesia	898	43
Malaysia	3,429	-
Philippine	2,450	43
Singapore	21.317	47
Thai Land	3,868	47
Vietnam	711	47

Source: The World Bank, 2006, [21, p. 66-68]

Some reports mentioned that productivity of Vietnamese labor was low, but this could not reflect the truth of the problem. Productivity of Vietnamese labor was influenced by out-of-date technology.

Human Development Index (HDI) of Vietnam was 0.704, ranked 108/170 of the world and the 6th/11 of Southeast Asia countries (Table 2.2.3.2)

Table 2.2.3.2 **Human Development Index (HDI)**

Southeast Asia	Value 2002	Rank 2002	Value 2003	Rank 2003
Brunei	0.867	33	0.866	33
Cambodia	0.568	130	0.571	130
East Timor	0.436	158	0.513	140
Indonesia	0.692	111	0.697	110
Lao	0.534	135	0.545	133
Malaysia	0.973	59	0.796	61
Myanmar	0.551	132	0.578	129
Philippines	0.753	83	0.758	84
Singapore	0.902	25	0.907	25
Thailand	0.768	76	0.778	73
Vietnam	0.691	112	0.704	108

Source: General statistics office, 2006, [7, p.768]

However, in Vietnam, the developmental speed of HDI was quite high. Its rank of HDI increased 4 steps for one year. This means that in future, if having a good

human resource policy, Vietnam will own plentiful labor resource with high quality.

Now, according to many foreign managers, Vietnam's labor has some strengths such as nimbleness and good ability to acquire knowledge. This was highly evaluated in professional skill contests of Asia. However, Vietnam's labor also has some weaknesses [11, p.7-9], [31]:

- Lack of knowledge of industrial working environment
- Lack of discipline
- Big gap between training in higher education and demand of FDI enterprises. Vietnamese students seem good in theory but confused in practice. Their knowledge is obsolete.
- English level of Vietnamese labors is week. This is the biggest difficulty for employers when recruiting hi-tech labors and difficult for employees to comprehend modern knowledge.

These weaknesses lead to limitation in productivity, in R&D.

In general, Vietnam has the plentiful labor force with cleverness, skilful hands, and low labor cost. However, its discipline, professional level, and English level need much improvement.

- *Policy system*

Established after war 1975 to support command economy, most Vietnam policies became obsolete. In the economic globalizing process, it is necessary to change these policies. Thus, in this stage, the policy system is unperfected. However, as compared with that of other developing countries in Asia, Vietnam's policy system is relatively certain. (Table 2.2.3.3)

Table: 2.2.3.3 **Policy uncertainty**

Developing Country	Policy uncertainty Major constraint %	Developed country	Policy uncertainly Major constraint %
China	32.9	Australia	..
Indonesia	48.2	Germany	5.8
Malaysia	22.4	Greece	9.3
Philippine	29.5	Spain	10.3
Thai Land	29.1	Unites States	..
Vietnam	14.7		

Source: The World Bank, 2006, [21, p.272-274]

To stimulate the development of domestic electronics industry, Vietnam government has some policies such as: owners of special projects can use land for the projects without paying rental or enjoyed 5 years rental exemption. However, due to the bad situation of domestic electronics enterprises, bureaucracy, unclear administrative procedures, these policies have been exploited by businessmen to do real estate business. To most companies this stimulation is beyond their reach.

Besides policies to directly support electronics industry, some indirect policies were issued such as:

- Promote development of human resource quality by stimulating studying abroad, stimulating the foundation of private universities.
- Increase the capacity of independent development of state enterprises by equitization process.
- Increase the source of capital by promoting the development of stock market.
- Renovate investment environment

However, these renovations have just begun from 2003, so it is still difficult to evaluate their effects in short time.

In general, Vietnam policy system is relatively certain. Government is trying to issues better policies to create perfect business environment, which enhances development of all key industries. However, bureaucracy, and unclear administrative procedures are barriers to the development of electronics industry.

- *Capital market*

Today, influenced by the integration into the world economy, Vietnam capital market has improved. Stock market, equitization process and development of the bank system have widened the capital market for Vietnamese electronics industry. However, success of capital mobilization mostly depends on ability of developmental strategies and image of Vietnamese electronics industry in future.

SUMMARY

Analyzing internal factors of Vietnamese electronics industry indicates that the Vietnamese electronics industry is still immature because:

- *The market share is small, and it becomes smaller due to the process of joining WTO.*
- *Technology is backward due to the lack of information, capital and predicable ability.*
- *R&D is weak. For a long period Vietnam government did not pay enough attention to R&D. The concept "Vietnam should take advantage of R&D achievements*

of previous comers" was too popular.

- *Because of the old educational system, the professional level and English level of Vietnamese labors are limited. Vietnam still lacks high-tech labor. The national spirit and discipline are also weak.*

- *Capital is very small and becomes smaller and smaller due to ineffective business.*

- *The vision of strategies and management level are very weak.*

Other external factors that affect the development of electronics are also weaknesses, e.g.

- *Vietnam's infrastructure is poor, backward and expensive because of lack of competitive pressure and government's attention.*

- *Supporting industries are still young. Recently, they have been enhanced by the joining of FDI but its effects to electronics industry are still unclear.*

- *Unclear administrative procedures and bureaucracy are the main barriers to general development.*

On the other hand, Vietnam has some strong points such as:

- *The labor force is plentiful and labor cost is cheap. Most Vietnamese labor is clever and skillful.*

- *The policy system is fairly certain. The Government always tries to issue better policies to improve business environment.*

- *The private sector has much potential to develop.*

Thanks to Vietnam's joining WTO and Vietnamese government's new policies, the chances to approach capital, technology, and experiences in management from other countries increase, reformation in enterprises is sped up, business environment is improved, and the market is expanded.

Besides opportunities, the risk of losing market to foreign companies, brain drain, etc. increases challenges to the existence of Vietnamese electronics industry.

However, with the increasing trend of association among nations to utilize their own advantages, remarkable developing potential of the private sector, and Vietnamese government' continuous effort to improve the policy system, Vietnam's economy will create new opportunities for the integration of Vietnamese electronics industry into the global electronics industry.

Chapter III

EXPERIENCES FROM KOREA, SINGAPORE, MALAYSIA

In the recently decade, Asia has emerged as a top region of electronics manufacturing. Like Vietnam, Korea, Taiwan, Malaysia and Singapore started as agricultural countries with good sea ports and cheap labor cost, but rich potential. However, after 30 years, these countries quickly became leaders of world electronics industry. Thus, studying policies and conditions that led to the success of these nations is very necessary for the development of Vietnam's electronics industry.

3.1 KOREA [14, p.1-25], [34]

During its early stage in the 1960s and 1970s, the Korean consumer electronics industry was mainly assembling foreign parts, usually for vacuum tube radio and black and white television sets. Today, Korea is the third largest producer in the world of consumer electronic products and component products, and Korea's electronics industry has become the world’s third largest industry. It is also the third largest exporter of consumer electronics products [20, p.6-11].

Why does Korean electronics industry - a latecomer - become so successful?

In the first stage, with the cheap labor cost and possession of very little indigenous technology, like most other developing industries, in Korea, the electronics industry relied substantially on foreign investment. Original Equipment Manufacture (OEM) agreements were considered as the best method to obtain technology and to access overseas markets.

Unfortunately, many of these early agreements initially did not provide many opportunities for the transfer of electronics technology to Korea.

Recognizing a precarious foundation of outside assistance, Korean government began to undertake an active role in solidifying the foundation of technological know-how and in constructing a research edifice for future.

Therefore, The Korean Institute for Science and Technology (KIST) was founded in 1966 to encourage more research and development in Korea, and to attract more foreign technology and Korean scientists trained abroad to come back to Korea.

In 1973, besides identifying goals and plans for speedy growth of local technology of National Council for Science and Technology, Korea government issued the law called "Promotion of Industrial Technology Development".

Then, more specialized policies were undertaken by Korean government to

promote R&D in key industrial sectors. For instance, by 1987, almost 95% of all corporate R&D in Korea was financed through preferential loans from the Government, and to promote private R&D, special financing schemes and tax incentive to technology-based corporation were formed. Following are some examples:

1. The reduction or outright elimination of tariff on imports of R & D equipment and supplies.

2. The deduction of non-capital R&D expenditures and human resource development cost from taxable corporate income

3. The rapid depreciation of industrial R &D facilities.

4. The exemption of real estate taxes on R&D related properties

The government also established a program called the Technological Development Research Fund, which allowed corporations to enjoy further duty reduction by setting aside 20-30 percent of all pre-tax profit each year for future R&D.

All of these incentives contributed to the economic climate in which all sectors were encouraged to establish their own technological infrastructure; therefore, Korea could reduce its dependence on foreign technology.

In addition to effects of Government's stimulating policies, the success of Korean electronics industry was contributed considerably by management discipline, Korean patriotism, and effort in enhancement of human resource quality.

In general, from the suitable strategies of development and flexible policy system that enhanced R&D capability of all sectors and human resource quality, Korea has reduced its dependence on foreign technology and become one of the leaders in electronics industry.

3.2 SINGAPORE

In 1960s, owing one of the excellent ports, Singapore's economy depended almost entirely upon commerce and export trade. Today, Singapore not only has the best port but also is one of the leaders in manufacturing electronics products.

Due to its capability of manufacture, service, telecommunication, public utilities and port service, during the late 1970s and early 1980s, multinational corporations tended to move to Singapore either for electronics assembly or for specialized industries needing intensive labor.

From 1978 to 1990, the value of electronics product per GDP fell from 32.2% to 27.7%. Manufacturing still depended on MNCs for technology. Very little R&D was undertaken on this island. "In order to further advance Singapore's technological

ability and transition to more sophisticated value added products, the government identified 6 development strategies" [2, p.10-15]:

Stategy1: Develop industry clusters

The rapid growth of Singapore's electronics industry was sustained by three key industry groups: MNCs, technologically intensive local companies, and supporting industries. Representatives from each of these "clustered" around specific types of products or technologies. Attention to specific types of products or technologies increased. New products were created. Through focusing on development of new products of each member in the cluster, local supporting companies with high proficiency in producing parts and components could become end-product manufacturers.

Strategy 2: Make Singapore a business hub

This strategy focused on growth in service by providing a location for regional headquarter and business service provision, logistic service, regional centralized communications, and media hubs and support of infrastructure such as education and healthcare.

This strategy attracted MNCs's participation in establishment of headquarters in Singapore.

Strategy 3: Promote regionalization

The government planned to fortify its ties with other countries in the Pacific Rim for greater domestic economic growth. It also planned to build partnerships with regional companies, enhance the bonds with developed countries and MNCs, and expedite government-initiated regional development plans. The goal was to make Singapore the gateway to the region and to the world.

Strategy 4: Develop business councils

Singapore government set up joint business councils to simplify cooperation. This strategy was applied to explore opportunities in international business.

Strategy 5: Build second "S" corporations.

Since Singapore got a boom in consumer market, the demand for goods and service almost shot up. Most of well-developed companies were at the top of the "S" curve, where it was difficult to pinch incremental sales. By the second "S" curve, companies were encouraged to grow in Singaporean MNCs by developing strategic plans, new products, and bigger markets. The government supported these companies by granting them "pioneer" status and by implementing programs supporting rapid local expansion. The goal was to help domestic and multinational companies in

Singapore to develop new capabilities that could lead to a second "S" curve of growth.

Strategy 6: Collective national marketing

Singapore wanted to sell itself on collective attractiveness. This means that the government, corporate sectors and academia worked together to satisfy common goals. Government invested heavily in training and tertiary institutions so that the nation could have better skilled laborers and engineers. The government also teamed up with foreign governments and leading MNCs to run technology training centers.

Due to interaction of the 6 strategies, R&D in all sectors received sufficient attention. (See table 3.2).

Table 3.2 **Singapore R&D Expenditure by Sector**

Unit: US $ million

Year	Private Sector	Higher Education Sector	Government Sector	Public Research Institute	Total
1991	316	105	69	51	541
1992	413	111	75	79	678
1993	442	112	76	83	713
1994	526	128	101	84	839

Source: Donald Beane, Anand Shukla, Michael Pecht, 1997, [2, p.22]

Quality of education was also enhanced. In 2000, Singapore was considered as the one of the nations having the best education.

In short, these 6 strategies, together with excellent effects of educational investment and R&D strategies, Singapore has become a new technological inventor of the world.

3.3 MALAYSIA

Malaysia also used to be an agricultural country. But after racial conflicts from 1969 to 1971, Malaysia entered a new stage of modernization. In the emphasis on industrialization for export, electronics industry took shape.

Today, after 30 years, Malaysia is considered as one of the world's leading exporters of semiconductors and consumer electronics.

What elements created this vigorousness?

In the first stage, Malaysia used its agricultural base and earnings from

offshore petroleum operations, and from the timber and palm oil industry to develop a primarily export-oriented economy. As this economic transformation began, Malaysia continued to develop its agricultural base but increasingly focused on industrialization. To create the basis for industrialization, the government tried to attract FDI. To attract multinational corporations (MNCs), the government enforced many encouraging policies. For example, the government financed 100% ventures that further enhanced technological transfer or offered good infrastructure, geographical location, and optimum local resource [2, p.25-26].

From the mid 1990s, realizing the limited domestic labor supply and the erosion of cost competition, the government announced a policy to shift from production-based economy (P-economy) to knowledge-based economy (K- economy) to grow out of the simple assembly industries dependent on foreign capital. The government paid attention to develop high value-added industries through R&D, IT investment, and quality of human resource [10, page10].

To increase R&D capacity, the government provided many incentives such as [2, p.33- 40]:

- A full income tax exemption or Investment Tax Allowance on qualifying capital expenditure for several years was granted for high-tech project or R&D companies.

- Investment tax allowance of 50% on qualifying capital R&D expenditure for five years was granted to companies carrying out in-house research.

- Industrial building allowances were given to buildings used for approved research projects.

- The Government established the Intensification of Research in Priority Areas Fund to provide financing for research projects that had commercial potential.

To improve the quality of human resource and managerial capability, Malaysian government adopted "Look East" policy in 1981 that encouraged Malaysians to learn from the developed economy of Japan and Korea. Thousands of Malaysians were sent abroad, especially to developed countries, to further their studies [10, p.10]

In general, Malaysia made a great effort to fortify its international standing in electronics industry through improving its educational facilities, placing greater emphasis on its research institutions, attracting multinational corporations, and updating the government's policies.

SUMMARY

Korea, Singapore and Malaysia had a lot in common with Vietnam:

agricultural countries with large seaports and plentiful labor force. However, after just some decades, these countries successfully developed their selected industries. Contributing to this success, the policy system played the main role.

At first, to develop electronics industry, they tried to attract FDI. So during this time, their electronics industries almost depended on foreign investment.

After ten years, realizing the difficulties in receiving the transfer of new technology from foreign countries and very little benefit from doing outwork that relied on advantages of labor intensive, Korea, Singapore and Malaysia used their own strategies to develop electronics industry.

With long-term plans for improving local technology, establishment of institutes, funds and Council for Science and Technology, special financing schemes, and tax incentive etc., Korean government created a powerful motive to enhance R&D capability and human resource quality.

Singaporean government combined interaction for benefit of all sectors (MNCs, technologically intensive local companies, and support industries) as well as the effect of business hubs, regionalization, and marketing to enhance technological ability. Especially, through all these activities, R&D capability and human resource were also enhanced.

Malaysian government adopted policies to move from production-based economy (P-economy) to knowledge-based economy (K- economy) by the establishment of institutes, funds for Science and Technology, special financing schemes, and tax incentive, and improvement of human resource quality through sending Malaysian students abroad for further studies.

Each nation had its own advantages and disadvantages. So policies for development of electronics industry were different. However, all nations focused on attracting FDI, as well as created the most favorable environment for development of R&D and technological transfer. They all tried to enhance the quality of human resource. R&D and human resource quality were considered the keys to stable development of their electronics industries.

Chapter IV

SOLUTIONS FOR VIETNAMESE ELECTRONICS INDUSTRY

In the previous chapters, an overview of Vietnamese electronics industry has been analyzed and experience of Korea, Singapore, and Malaysia has been summarized. It is indicated that electronics industry has not only developed successfully but also contributed dramatically to the economic growth of these three countries. However, it has developed very slowly and weakly in Vietnam. Thus, to push the industrialization, modernization, as well as economic growth, solutions for Vietnamese electronics industry are essential, which is also the aim of the thesis.

4.1 FOUNDATION FOR THE SOLUTIONS

The SWOT analysis is considered as one of the effective tools usually used by economists dealing with strategic planning for development of industries. By evaluating a Vietnamese electronics industry's strengths, weaknesses, opportunities, threats, SWOT matrix can help planner find out strategies to exploit that industry's strengths or defend against its weaknesses. Therefore, SWOT matrix analysis will be chosen as the foundation for the solutions to develop Vietnamese electronics industry.

SWOT stands for Strengths, Weaknesses, Opportunities and Threats.

Strengths and weakness are internal factors that involve an organization or business own internal abilities or lack thereof. Opportunities and threats come from external environment.

SWOT analysis consists of three steps. First, the strengths, weaknesses, opportunities, and threats must be identified. Second, a SWOT matrix is developed to combine relevant factors. Third, strategic alternatives are generated for each combination.

The SWOT Matrix

SWOT	Opportunities(O)	Threats (T)
Strengths (S)	Combine S&O to utilize opportunities	Combine S&T to limit threats
Weaknesses (W)	Combine W&O to limit weaknesses and utilize opportunities	Combine W&T to limit weaknesses and threats

4.2 SOLUTIONS FOR VIETNAMESE ELECTRONICS INDUSTRY (SWOT MATRIX APPLIED)

4.2.1 List of opportunities, threats, strengths, weaknesses

Based on the analysis in chapter I and II, some main strengths, weaknesses, opportunities and threats of Vietnamese electronics industry are as follows:

- *Strengths:*

S1: Labor resource is plentiful
S2: Most Vietnamese labor is clever and skillful.
S3: Labor cost is cheap
S4: Policy system is fairly certain
S5: The private sector has considerable potentials to develop

- *Weaknesses:*

W1: Market share is small
W2: Technology is backward by lack of capital and weakness in predicable ability development trend.
W3: Capital is small
W4: Vision strategy and management level are week
W5: High-tech labor is insufficient because of the old educational system
W6: Vietnamese labor's discipline and national spirit are low
W7: Research and development policies are weak due to the Government's insufficient interest. The concept that Vietnam should take advantages of R&D achievement of previous comers is too popular
W8: Supporting industries are rather young
W9: Without competitive pressure, infrastructure is poor and expensive
W10: Unclear administrative procedures and bureaucracy are high

- *Threats:*

T1: WTO accession increases the pressure of competition
T2: Technology, service and promotion policies determine the success of competition, but Vietnamese's technology, service and promotional policies are all weak
T3: Brain-drain

- *Opportunities*

O1: There are more chances to approach capital, new technology and model management experience
O2: There are more chances to expand into the global market

O3: Associate trend to utilize advantages increases

4.2.2 Application of SWOT matrix

SWOT integrating	Opportunities(O) O1: More chances to approach capital, new technology and model management experience. O2: More chances to expand the global market O3: Associate trend to utilize advantages increases	Threats (T) T1: WTO accession increases the pressure of competition. T2: Technology, service and promotion policies determine the success of competition. T3: Brain-drain
Strengths (S) S1: Labor resource is plentiful S2: Most Vietnamese labor is clever and skillful. S3: Labor cost is cheap S4: Policy system is fairly certain S5: The private sector has considerable potentials to develop	Combine S&O to utilize opportunities S1, S2, S3, S4, S5, O1, O2, O3: Attract investment into electronics industry S1, S2, O1, O3: develop training system and association in training S4, S5, O1, O3: Enhance capacity of the private sector	Combine S&T to limit threats S1, S2, S3, T1: Improve labor quality, the key factor in competition S2, T1, T2: Enhance quality of service and promotional polices by training system, and improve technology in products by increasing investment in R&D
Weaknesses (W) W1: Market share is small W2: Technology is backward. W3: Capital is small W4: Vision strategy and management level are week W5: Lack of high-tech labor W6: Discipline and national spirit of the labor are low. W7: R&D is weak. W8: Supporting industries are rather young W9: Infrastructure is poor and expensive W10: The unclear administrative procedures and bureaucracy are high.	Combine W&O W1, O1, O2, O3: Enhance quality of management and marketing activities, and enhance association. W2, W3, W7, O1, O3: Attract investment and association in technology, capital, and R&D. W4, W5, O1, O3: Enhance quality of labor by training system and association in training W8,O1, O3: Stimulate investment to supporting industry, and enhance the cooperation between electronics industry and supporting industries W9, O1 : Apply new technology to enhance the quality of infrastructure	Combine W&T to limit weaknesses and threats W1, T1, T2: Increase marketing activities & improve service quality. W6, T3: educate patriotism, national spirit and discipline for young generation. W7, T1, T2: Invest more in R&D W9, T1: Accept competition in infrastructure to increase quality and to reduce cost. W10, T1: Issue consistent policies, simplify administrative procedures and prevent bureaucracy.

Analyzing SWOT matrix implicated that to promote Vietnamese electronics industry, many factors should be paid attention to e.g. R&D, capacity of the private sector, investment business environment, development of supporting industries, infrastructure, technology levels, government policies etc. However, human resource quality is the most important. It is related to the quality and growth of other factors.

4.2.3 Details of solutions

4.2.3.1 Research and Development

Vietnamese government issued policies relating to reducing income tax and supporting land for R&D project. However, it was not enough to enhance R&D capacity.

Vietnamese government should learn from Korea's policies such as:

For further improvement in R&D of all sectors, the government should establish fund offering financial aid to individuals and organizations with R&D projects that have high feasibility, commercial potential or usefulness in development of technology.

In order to effectively offer technical support to individuals, private organizations and to learn foreign technology, Institute of electronics technology should be established. Working conditions should be especially bettered to attract talents.

In addition, to increase R&D capacity and to utilize achievements of R&D in laboratories of institutes, universities and enterprises, exchange and trade of R&D achievements should be enhanced and stimulated.

Government should issue more preferential policies such as:

- Deduction of non capital R&D expenditure and human resource development cost from taxable corporate income
- Accelerate depreciation of R&D facilities
- Exemption or deductions of income tax for companies whose R&D results can be applied in production.
- Administrative procedures should be clear and simple so that all economics sectors can benefit from these preferential policies

To protect the rights of individuals and organizations that invest in R&D, law of intellectual property and copyright law should be enforced.

4.2.3.2 Enhance human resource's quality

Quality of human resource depends on many factors. Among them, education is the main factor that builds one's behavior and basis of knowledge. Then, through interaction in their working environment, quality of human resource will increase or reduce. Thus, it is essential to improve educational quality and working environment to promote intellectual ability and professional skills.

- Training system and association in training

  - Reform educational system, e.g.

    - Increase interaction between theory and practice.
    - Create flexible mechanism in program to enhance the exchange of knowledge, experience between universities and enterprises
    - Build new training programs to meet future demands
    - Enhance English level for better approaching modern knowledge of the world.

  - Establish special policies encouraging high technological companies and famous international universities to open branches or to participate in training labor in Vietnam, for example, exemption of tax income, turnover tax, or land allowance, or infrastructure support, etc.

    To high technological companies, direct participation in training creates many benefits: first, training expense is paid so these companies can reduce expense on re-training new employees (which high technological companies often have to do); second, they can choose the best employees without spending time and money on recruiting

  - Stimulate famous international professors (especially in technological or scientific areas) to participate in training by offering perfect accommodation, exemption of tax income.

  - Create policies to encourage institutes, universities or schools to equip or to renew modern facilities for study such as accepting accelerate depreciate of educational facilities, reducing their financial obligation.

  - Offer financial aids to professors and teachers to study in developed countries. Through approaching new teaching methods and new knowledge, the quality of teaching will be improved.

  - Develop scholarship fund for excellent students.
  - Promote students' studying in developed countries by simplifying the administrative procedures for studying abroad, developing consultancy net, and creating trend of study abroad like "Look East" policy of Malaysia

- Improve working environment and management structure

- Create working environment in institutes, universities and enterprises that stimulates individual effort, creativeness, and development of professional skills, for instance, modern facilities for research and development, system of bonuses or salary, promotion, working pressure, working discipline.

- Speed up the equitization of state enterprises to reform management apparatus. Offer the talents suitable positions to develop their ability.

- Create favorable conditions for managers, engineers and workers to participate in training courses, especially in developed countries. Establish Government's consulting agencies to support companies in sending labor to developed countries for training professional skills.

- Develop Joint venture enterprises and employ international managers to learn more managing experience.

- Other factors.

- Poor discipline is one of the most serious weaknesses of Vietnamese labor force. A modern, industrial society always demands labor with high discipline because it enhances one's concentration, productivity, and creativity. Thus, from nursery to tertiary education, Vietnamese people should be better disciplined.

- National spirit should be aroused in schools, enterprises, and society as a symbol of Vietnamese people. This not only stimulates Vietnamese scientists to comeback Vietnam, encourages Vietnamese students to study abroad to achieve new and modern knowledge but also prevents brain-drain.

4.2.3.3 Attract investment and promote association

- Attract investment to industries and service.

Vietnam should imitate some Singapore's strategies such as “Make Singapore a business hub” to create a business hub at Vietnam, establish business councils to support foreign investment into Vietnam and to support domestic producers to expand into the world market.

- Marketing Vietnam’s advantages such as human resource, seaport system, geographical position, certain policy system, Government's effort to improve business- investment environment….

- Create FDI attraction by open and stable investment climate, and by low cost of business. Vietnam should simplify administrative procedures in issuing investment licenses, supply perfect infrastructure, reduce land-tax in building stage, etc.

- Introduce a list of priority industries and stimulating policies to promote these industries.

Nowadays, the associate trend in industries and in services is increasing. The development of this industry will push the development of other industries. So, we should not limit the investment to only electronics industry and few industries.

- Attract investment into technology

  Motivate investment into new technology by:

  - Accelerating depreciation of machines that use new technology.
  - Creating favorable conditions for the transfer of technology such as simplifying the procedure for import or transfer technology
  - Promoting investment into new technology such as exemption or reduce import tariff

  Prevent transfer of old technology by

  - Establishing criterion for imported equipments
  - Forbidding to import old technology

- Attract investment to capital market

  Promote equitization of state enterprises to mobilize capital from the whole society. This also speeds up the renovation in management methods, manipulation labor resource, investment into technology and R&D and contributions to reduce inertness of state enterprises.

  However, to prevent national loss from equitization, land-price and factory-price should be evaluated by market, for instance.

  - Develop stock market to mobilize leisure money and to attract investment from business partners with high technology, capital, strategies, etc to promote development of domestic enterprises.

  - Develop the bank system and establish supporting fund to help small domestic enterprises with much potential to develop their business.

- Enhance association

  Associations should not follow the old method. According to this, objects of joint venture enterprises mostly were foreign partner and state enterprise. To assure the command and control rights of the state, foreign business partners' capital had to be lower than their domestic business partners'. However, due to Vietnamese partners' limited capital resource and Vietnamese managers' weakness, joint venture enterprise's productivity could not grow, and investment into technology, marketing was also limited. This led to foreign business partners' displeasure and abandonment of joint venture form.

To improve the situation, it is suggested to:

- Stimulate association between foreign partners and all kinds of domestic partners.
- Accept and stimulate the domination of foreign partners' capital.
- Study their management experience
- Assure all partners' interest by the law system.
- Encourage more technological exchange

Let put this stage as a training stage.

4.2.3.4 Innovate infrastructure in quality and expense

Vietnamese government should accept FDI investment and abolish monopoly in electricity supply, water supply, transportation and communication to create competitive pressure for more renovation in quality and cost.

To increase effect of the above policies, anti-corruption campaigns should be launched and stipulations relating to anti-corruption should be constructed and improved.

4.2.3.5 Promote supporting industries

To promote supporting industries, Government should promote the development of "industry clusters" like Singapore's, attract investment in supporting industries through effective policies such as decreasing land-tax, decreasing rental, building more industrial parks, etc.

Private companies with high flexibility in technology transfer are very suitable to develop supporting industries, so they should be favored.

4.2.3.6 Improve thef promotional activities and services

To upgrade quality of promotional activities and services, improving professional skills of specialists is the most important. So quality of training system should be received more attention.

Vietnamese enterprises with limited capital, international market knowledge, marketing ability are very difficult to approach international market by themselves. So it is necessary to establish oversea business councils to support companies in marketing activities and to approach modern trends in service quality.

4.2.3.7 Improve the policy system and the structure of administration

The daunting administrative procedures, bureaucracy, and corruption are the biggest challenges to Vietnam innovation process. Thus, to eradicate these barriers,

reforming administrative procedures is very necessary. Government should promote innovating of the administrative structure. The administrative structure should be neat, simple, effective, and easy to be supervised by citizens and the concerned. Mechanism of dialog between government or appropriate authorities and enterprises or citizens should be expanded.

In addition to perfecting administrative structure, the policy system is the key to speed up the industry's development and to protect enterprises from misfortunes. Thus, policies should be perfect, stable and clear. They should be able to anticipate what might happen in future, and they have to promote investment, renovation, and enhance advantages of nation and enterprises.

4.2.3.8 Development of the private sector

The development of Vietnamese electronics industry in recent years has indicated that there is a decline of state sector and significant development of private sector. With self-motivating management and neat and flexible structure, the private sector has effectively utilized advantages to expand its market. So it is advisable to promote developing the private sector as the key sector in enhancing domestic electronics at this stage. To increase stable development, Government should have good long-term plans for development of electronics industry. Orient and help private sectors participate in supporting industries or some fields of electronics industry that need small capital and high flexibility, e.g. Subcontract form with foreign partners should be paid attention to and stimulated.

To increase capacity of the private sector, supporting capital and technology, providing knowledge of international commercial laws, international product standards, forecasting economic development and the trend of products are very necessary. Thus, Government should establish consulting agencies to support enterprises in these areas.

Government should support and consult them and create favorable condition to transfer and study experience, knowledge in Vietnam as well as developed countries by diversifying educational forms. For example: if one needs to study management skill he doesn't need submit the certificate of high school diploma, or if he wants to be trained in developed countries he can be consulted and stimulated by government agencies (In Vietnam, most of educational consultancies are for high-school students and undergraduates. Thus, it is very difficult for businessmen and employees in the private sector to approach international training systems).

4.2.3.9 Other suggestions

Recently, the trend of the combination of electronics and information has been growing. Vietnam is considered more potential in software industry. With the

growth rate of 35% to 45%, and 20,000 professional software engineers, Vietnam has become one of the most successful 25 nations in doing outwork of software (the comment from Asian-Oceanian Computing Industry Organization in 2006)

Due to the strength on doing outwork of software, producing software in electronics products can be a good strategy for Vietnamese Electronics Industry.

Chapter V

CONCLUSION

Analyzing the overview of electronics industry and current situation of Vietnamese electronics industry after Vietnam's joining WTO indicates that:

Vietnamese electronics industry got some advantages such as labor resource is plentiful, most of the labor is clever and skillful, labor cost is cheap, the private sector has much potential to develop, the policy system is fairly certain, and Government always endeavors to issue policies that attract investment and improve business environment.

However, these advantages are out numbered by the disadvantages. Vietnamese electronics industry is weak and infant. Most internal factors such as technology, R&D, capital, vision of strategies and professional levels are also weaker than those of other Asian countries. In addition, the weaknesses of external factors like infrastructure, supporting industries, administrative procedures also increase the difficulties to Vietnam electronics development since Vietnam's joining WTO.

From the experiences of Korea, Singapore and Malaysia and the analysis of SWOT matrix, we realize that to create a successful electronics industry when joining WTO, besides attracting investment and association in manufacture, technology, service, infrastructure, supporting industries, reforming administrative procedures, etc, enhancing human resource and R&D is the most important. R&D and human quality should be considered the keys to stable development of electronics industry.

In Vietnam, because most the weaknesses of internal factors and external factors have been influenced by weakness of vision strategy, management level, obsolete conception and professional skills, so human resource quality becomes far more important than it is in other countries. In other words, education should receive special investment.

It usually takes time upgrade human resource quality to meet the requirements of development. Thus, now Government should make it a priority to break the barriers to electronics industrial development by simplifying administrative procedures, improving investing environment, rejecting monopolization in infrastructure.

Without the changes of internal factors and improvement of external factors, Vietnamese electronics industry is difficult to exist, not mentioned to flourish, after joining WTO.

BIBLIOGRAPHY

1. Department of External relations- HCM City, 2007, Vietnam's accession to the WTO, www. mohahcm.gov.vn.
2. Donald Beane, Anand Shukla, Michael Pecht, 1997, The Singapore and Malaysia electronics industry, CRC Press.
3. Doan Viet Hai, 2001, Solutions for Vietnam electronics industry, University of Economics, HCM City.
4. Do Hoai Nam, 2006, Opportunities and challenges for Vietnam in WTO accession, WTO Forum.
5. Fusion Consulting, 2005, Southeast Asia electronics industry outlook, www.fusionc.com.
6. General statistics office, 2006, Vietnamese industry in 20 years of renovation and development, Statistical Publishing House.
7. General statistics office, 2006, Statistical Yearbook of Vietnam 2005, Statistical Publishing House.
8. General statistics office, 2006, The Vietnamese international merchandise trade for twenty years renovation (1986-2005), Statistical Publishing House.
9. Hai Linh, 2004, Vietnamese electronics industry - the weaknesses, www.vietnamet.vn.
10. Hisami Mitarai, Feb 2005, Issues in the ASEAN Electric and Electronics Industry and Implications for Vietnam, Asia Business Consulting Department, Nomura Research Institute.
11. Japan International Cooperation Agency, National Economics University, Sep 2006, A Symposium on Industrial and Trade Policy of Vietnam under international Integration, National Economic University.

12. Japan External Trade Organization, Sep 2006, East Asia Economic Integration and the role of Jetro, Japan External Trade Organization.
13. Luong Van Tu, 2007, Vietnam's WTO accession, www.mpi. gov.vn.
14. Michael Pecht, 1997, The Korean electronics industry, CRC Press.
15. Nguyen Văn Xuyen, 2006, How to develop Vietnam electronics industry, 1/10/2006, Vietnam Economy and Worldwide Economy magazine.
16. Nguyen Thi Thanh Ha, 2004, Competitive capacity of Vietnamese Electronics enterprises, Economic Research magazine, Vol. 312/2004.
17. Le Huu Phuoc, 2001, Current situation of Vietnamese electronics industries, University of Economics, HCM City.
18. Peter Gallagher, 2000, Guide to the WTO and developing countries, Kluwer Law.
19. Park Jong-Kun, 1984, the promotion of the Korean Electronics industry.
20. Research Report of CIAPR, 2002, Prospect report of IT application in Asia, TCDC network.
21. The World Bank, 2006, 2006 World Development Indicators, The World Bank.
22. Thu Huong, 2002, Vietnam electronics industry, Industry magazine, Vol.14/2002.
23. Toshima ASAKA, 2005, Perspective of Japanese Electrical manufacturers, A Roundtable Seminar on Japanese FDI in Asian countries.
24. To Duc Hanh, 2004, Competitive capacity of Vietnamese Electronics Industry, Trade magazine, Vol. 7/2004.
25. Tran Đinh Thien, August 2006, WTO accession - opportunity and challenges, economic research magazine, Vol. 339.

26. Tran Nguyen Tuyen, 2006, Vietnam's WTO access - Challenges, opportunities and solutions, www.vietnamnet.vn.
27. University of Economics, 2005, WTO and experience for new members, University of Economics, HCM city.
28. Van Xuyen, 2006, Enhance development of Vietnamese electronics industry, Vietnam Economy and Worldwide Economy magazine, Vol. 10-06.
29. Vietnamese Electronics and Informatics Corporation, 2000-2006, Annual report.
30. Vietnam Electronics and Informatics Corporation, 2007, History of Vietnam electronics and Informatics Corporation, www.vietronics.com.vn.
31. Vietnam economy newspapers, 2007, Labor quality-thorny problem for Vietnam, www.vneconomy.com.
32. World Trade Organization, 2007, "The World Trade organization… ", WTO.
33. Yumiko Okamoto, 2007, Vietnam's Industrialization Strategies in the Age of Globalization.
34. Yoo Soo Hong, 1993, Leveraging technology for strategic advantages in the global market: case of the Korean electronics industry, Korea Institute for International Economic Policy.