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INNOVATIONS AND SOLUTIONS FOR VIETNAMESE MEDIUM-SIZED ENTERPRISES TO PARTICIPATE IN SUPPORTING INDUSTRIES

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Chapter 1 Introduction

1.1. Background

Currently, Vietnam has many opportunities to develop supporting industries (SIs) and participate in the global supply chain because Vietnam and ASEAN countries are attractive investment destinations for international investors, especially big industrial corporations from Japan and Republic of Korea. Previously, China was the regional production centre, but China is being oriented by many corporations as a target consumption market rather than a manufacturing market at the current time. Two of the many fundamental reasons are the lingering influence of US-China trade war and the fear of technology theft as well as business secrets of multinational corporations.

According to a report by the Japan External Trade Organization (JETRO) in 2018, the localization rate of industries in Vietnam is still low compared to many countries in the region. While the localization of materials, spare parts and components in Thailand is 57%, China is up to 68%, this figure is only 34% in Vietnam. At present, only about 300 domestic enterprises can supply and participate in the supply chains for multinational corporations among total of more than 1800 enterprises in SIs. Their capacity is small and only meet from 20% to 30% of the total demand for the industrial sectors.

In recent years, Vietnamese government issued many policies and measures to promote the development of SIs. These include Decision 68/2017 / QD-TTg on the development plan for the SIs over the 2016-2025 period, which was issued by the government in 2017 to boost investment and meet domestic demand for input materials. Or Decree 111/2015 / ND-CP related to import taxes, value added tax and corporate income tax (CIT). Many tax incentives are offered to manufacturers operating in the List of prioritized supporting industrial products that published by the government.

Vietnam is a developing country and most enterprises are small and medium sized. Therefore, these companies face to a lot of problems and threats when engaging in SIs and global supply chains. Difficulties in capital, technology, human resources and strong competition from other countries have a significant influence on the development decisions of these firms. However, Small and medium sized enterprises (SMEs) in Vietnam are also

having a lot of potential opportunities to grow in SIs, especially Medium-sized enterprises (MEs). They have not only the internal advantages for competitiveness and overcome difficulties and threats in this industry. Vietnam is a promising and attractive investment place for many large technology corporations nowadays. The searching for domestic sources of alternative spare parts or components to replace imported material sources for main industry productions is essential to reduce costs and minimize risks about shipping, delivery, shortening the delivery lead time, etc... Moreover, human resources in Vietnam are young and labour cost is cheaper compared with Thailand or China and human resource for SIs is growing rapidly and are being heavily invested.

This research not only clarifies the difficulties and opportunities for MEs in Vietnam to participate in SIs but also analyses solutions and innovations to help these companies grow, improve, enhance the competitiveness in the domestic market, especially compete with FDI enterprises, and participate in global supply chains.

1.2. Objective of the study

This study will focus on analysing current status of Sis in Vietnam, the main causes of existing problems then finding solutions for MEs in Vietnamese SIs to solve it. So, how to determine whether MEs? What are the criteria that differentiate MEs from other size firms?

In the world, there are many definitions of the size of an enterprise and in each country, they have their own criteria to identify but it almost based on three basic factors: number of employees, capital and turnover. According to the criteria of the World Bank Group, micro enterprises are enterprises with the number of employees under 10 people, small enterprises with the number of employees from 10 to less than 200 people and capital of 20 billion USD or less, and MEs have from 200 to 300 employees with capital of 20 to 100 billion USD. The European Union (EU) rules that large companies as one that have more than 250 employees, MEs have less than 250 people, small companies are identified with fewer than 50 employees and micro-companies which employ up to 10 staffs.

In Vietnam, the size of an enterprise is based not only on the number of employees and the capital but also on the sector in which it operates. According to Article 6, Decree No. 39/2018 / ND-CP dated 11 March 2018 of the Government, stipulates in Table 1.1.

Table 1.1: Definitions of the size of an enterprise in Vietnam

Company's sizes	Micro enterprise	Small enterprise		Medium enterprise		Large enterprise	
Company's type	No. of Employees	Capital (billion VND)	No. of Employees	Capital (billion VND)	No. of Employees	Capital (billion VND)	No. of Employees
Agriculture, forestry and fisheries	<10	< 20	10~200	20~100	200~300	>100	>300
Industry and construction	<10	< 20	10~200	20~100	200~300	>100	>300
Trade and services	<10	< 10	10~50	20~50	50~100	>50	>100

Source: Author

Micro- sized companies in the fields of agriculture, forestry, fishery and industry and construction are recorded an average number of labors paying social insurance not more than 10 billion VND and an annual turnover les than 3 billion VND or the total capital not more than 3 billion VND. Micro enterprises in the field of commerce and services have an average number of employees participating in social insurance no more than 10 people per year and total annual revenue not more than 10 billion VND or total capital not more than 3 billion VND.

Small enterprises in the fields of agriculture, forestry, fishery and industry and construction have an average number of employees participating in social insurance, not exceeding 100 people and the total annual revenue does not exceed 50 billion VND or the total capital source does not exceed 20 billion VND, but it is not a micro enterprise as prescribed in this Article. Small businesses in the field of commerce and services have an average number of employees participating in social insurance no more than 50 people and total annual revenue not more than 100 billion VND or total capital not more than 50 billion VND but is not a micro enterprise as stipulated in this Article.

MEs in the fields of agriculture, forestry, fishery and industry and construction, with an annual average number of labors participating in social insurance of no more than 200 and a total annual turnover of not more than 200 billion VND or the total capital source does not exceed 100 billion VND, but it is not a small enterprise or a micro enterprise as prescribed above. MEs in the field of commerce and services have an annual average number of employees participating in social insurance no more than 100 and total annual revenue of not more than 300 billion VND or total capital not more than100 billion VND, but is not a microenterprise, or a microenterprise as prescribed in this Article.

1.3. The reason of choosing Medium-sized enterprises

Each size of enterprise has its own advantages and disadvantages, but for SIs in Vietnam, MEs have more opportunities to develop and go far faster. While small companies have difficulties because of not enough resources and capacity to compete with FDI and regional businesses, large firms in Vietnam face many difficulties in administrative procedures, high taxes and other matters according to Vietnamese business law, MEs have a lot of strengths to participate in SIs.

Compared with small companies, MEs now have more favourable conditions to join in the supply chains in SIs. In Vietnam, there are many industrial corporations investing and doing business, leading to a huge demand for raw materials, components and spare parts. However, it also requires suppliers to have a certain level of technology, production capacity and other resources so that these corporations can switch to localization of raw materials. Many small companies in Vietnam are unable to provide products because the quality of goods is not qualified or unstable due to old machinery and low production technology, often buying used machines from China or Japan at low prices because of limited financial resources, and many operations are manual in manufacturing processes. Some small manufacturers that can produce high quality products to supply to large corporations. However, their size of the enterprises and the capacity are too small in order to become vendors of big corporations. It is very difficult for large firms deciding to localize if domestic producers can only supply raw materials less than 5% of demand. When dividing the quota among vendors and deciding to partially localize, the local suppliers usually must supply at least 10 ~ 20% of the total demand. Because the management of suppliers, goods is so

complicated when there are many vendors. And if local companies can only supply a fraction of the needs, cutting costs from localization instead of importing is not effective, not to mention management costs and risks of the delivery or controlling of input materials.

For large enterprises, MEs also have many advantages for competition. Firstly, they are more flexible: MEs can easily change and act when they determine fluctuations of market or needs, compared to large companies with bulky and complicated apparatus and administrative procedures. A typical example is that a medium company can raise the price of its product when the price of raw materials fluctuates without negative consequences but a larger company cannot do it without fear of being resistant to impact of union organization or government intervention. Secondly, they have bigger motivation: big companies often face with the issue of disagreement in the board of directors and shareholders because of a dispute of interests. This has a significant impact on business operations and business strategy. For example, many shareholders will reject a good business plan that helps that corporation growing but affects their personal interests. However, in MEs, shareholders are more united and have great motivation to develop the company. Moreover, employees at large corporations are recognized to care more about their salaries and bonuses than working hard and contributing to the development of their workplace. This is also a result of the relationship distance problem between managers and employees. While MEs can easily care, influence their employees and strengthen relationships to motivate employees working more effective, it is a big problem with large corporations with complex management systems and high hierarchy in organizational charts. It is difficult for senior managers to interact with subordinates. Differences in perceptions, benefits, and visions make employees of these organizations not interested in or not pay much attention to the development of the organizations but assume that it is the duty of the managers. Thirdly, MEs have less conspicuousness: it is always good for smaller manufacturers to introduce new products into the market with no excessive noise or attention from competitors, related organizations or government unions. Multinational and big companies are constantly facing proxy battles, antitrust actions and government regulations. Fourthly, less bureaucracy: the chains in orders in large corporations extend the deciding aspects of running an organization, but there is no such bureaucracy for medium businesses. It is a reason why business owners and

managers decide to run a smaller business than they can although they can sign up their company into larger companies.

Moreover, there are many MEs fully capable of competing with large-sized enterprises. There are many reasons why these companies do not register to become big businesses and still identify MEs, resulting in a relatively small number of large companies in Vietnam. According to the information of the Ministry of Planning and Investment of Vietnam in 2019, the number of large enterprises in Vietnam is over 2% while MEs is about 21,000 enterprises, accounting for 3.47% of the total number of enterprises. This figure is still quite modest compared to the structure in other economies with a more sustainable business sector, in which the proportion of MEs usually accounts for 5-10%.

The case of private enterprises intentionally reducing business size to a certain extent instead of continually expanding scope and business size is not uncommon in Vietnam. According to some experts, except for large corporations and enterprises that are among the 2% of large-scale enterprises, most MEs do not want to grow to a large company. As reflected by business owners, the bigger the business and the more successful the business is, the more often it will face more pressure due to the greater fees for compliance with administrative procedures and inspection. More and more prone to harassment by administrative agencies and taxes. That's the reason why most average businesses, once developed, will most likely reduce their business size to a certain extent and invest money in other areas instead of continuing to expand their scope of business activities. In other words, these enterprises are deliberately unwilling to grow.

In the context that revenue sources from import and export taxes will gradually decrease in accordance with trade agreements, the trend is that budget revenues will gradually shift to domestic enterprises. This also means that Vietnam is forced to push domestic enterprises to develop as much as possible to increase budget revenue from tax collection if it does not want to fall into a budget deficit. This has led to MEs not wanting to register as large businesses to circumvent the law: reducing tax rates and receiving other government incentives for small and medium enterprises. The lack of incentives for development conditions such as loans, while the pressure on fees and troubles from state agencies for large enterprises has increased, making most of these enterprises do not have any motivation to expand production and business though they have enough conditions.

1.4. The important of the study

Compared with other countries in the Asia, domestic enterprises in Vietnam are having lot of development opportunities in SIs when the localization rate is low, with the supporting of the government and domestic competition is small. However, why has Vietnam's SIs not developed as expected? While other countries like Japan or South Korea need only 20 years to build a successful developed SIs, Vietnam has gone for 30 years but the results are still very limited compared to the available capacity.

The current situation shows that Vietnamese enterprises still have many problems to be able to participate in the supply chains for large firms and multinational corporations both domestically and internationally. Besides facing difficulties of lacking capital, human resources, technology... Vietnamese companies are still hesitant to invest and develop to participate deeply in the global supply chains. However, these problems have solutions.

Many MEs in Vietnam are having the capacity and opportunities to develop in SIs but still have no motivations. Many businesses do not dare to invest despite having a sufficient capital because there are no solutions for difficulties, lack of experience in supply chain operations as well as experience working with and supplying for large corporations. Therefore, analysing and providing solutions for these businesses is extremely necessary to be able to develop Vietnam's SIs and create a driving force for the development of the main industries. In recent years, the Vietnamese government has also provided some supportive measures to promote businesses in the SIs, but that is not enough. Besides external solutions and motivations, innovations and solutions from the business itself are even more important. Because only these enterprises understand their problems and determine which solutions are appropriate or effective. It depends a lot on the business sectors, business status, market challenges in the industry in which it operates and many other factors.

Chapter 2 . Literature review - Supporting industries in Vietnam

2.1. Overview

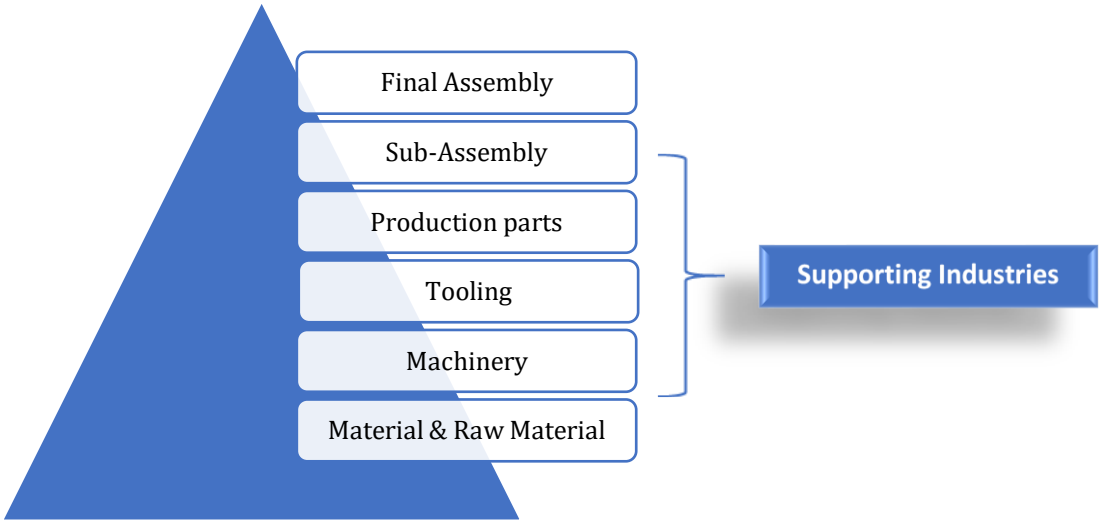
2.1.1 Concept and definition of supporting industry

The term SIs have been widely used in Southeast Asia and has been popular in Vietnam since early 20th century. However, the definition of SIs has not been really cleared. In ASEAN, there are many definitions currently in use, but these revolve around two main approaches, in economic theory and in the framework of business.

According to economic theory, SIs are defined as input production industries. The final goods and products are created from the processes of manufacturing and assembling inputs. SIs are the industries that produce input products, including intermediate products and goods, products and goods for the production process.

In the framework of business, there are two ways of understanding SIs. In a narrow angle, they are the production of spare parts and components for the assembly stage of finished products. In a broader sense, they are understood as the entire industries that produce all parts of a product as well as the machinery, equipment or other physical elements that contribute to the product (Figure 2.1).

Figure 2.1: Concept of supporting industries in a broader sense



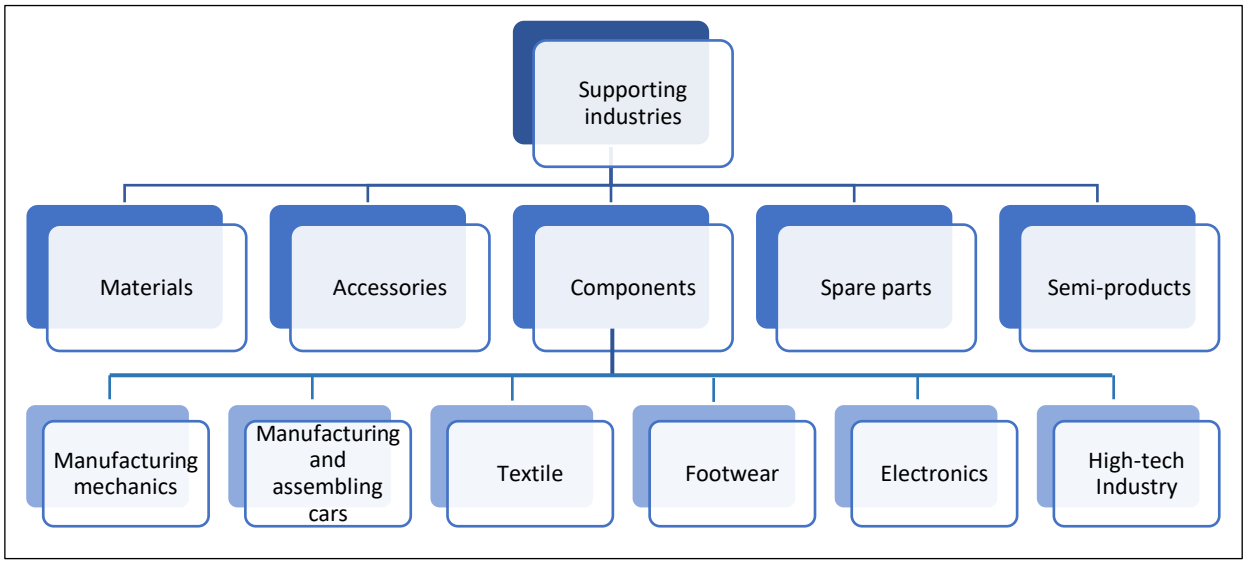
Source: Junichi Mori (2005)

Since Vietnam attracted a lot of Korea and Japan companies, the term supporting industry has become popular. Firstly, when Vietnam and Japan signed the "Vietnam-Japan Joint Initiative Phase I (2003-2005) in 2003 to develop SIs with more than 40 main

categories. By 2007, the Ministry of Industry and Trade issued a definition of SIs in the decision of supporting industry development planning to 2010, with a vision to 2020, according to which the supporting industry is understood as: production and technological establishments producing input products, which are raw materials, components and spare parts, etc… for assembly of final industrial products.

The concept of SIs has been updated many times in decrees or resolutions of the Vietnamese government and it is now understood under the Government's Decree No. 111 / ND-CP, dated November 3, 2015. [Appendix 4]: "Supporting industries are industries that produce raw materials, materials, components and spare parts to provide for the production of finished products" (The list of supporting products includes industries: Textile, Footwear; Electronics; Manufacturing and assembling cars; Manufacturing mechanics; Supporting products for High-tech Industry).

Figure 2.2 : Supporting *industry from the Vietnamese government's perspective*



Source: Ministry of Industry and Trade (2007)

This view is more limited and relatively narrow compared to the above definitions and goes into more detail about the types of products in SIs. In addition, this definition has many limitations such as the lack of many SIs in Vietnam such as processing agricultural products (including seafood), manufacturing machinery, agricultural materials, production of motorbikes and ship building industry.

2.1.2 The main supporting industries in Vietnam

At present, many major industries in Vietnam do not have associated SIs or the ratio of domestic auxiliary products is very low, leading to a high reliance on imported raw materials such as electronics, textiles, footwear, auto assembly, car or machine manufacturing.

After Vietnam has joined the WTO and AFTA, a lot of FDI enterprises has poured capital and stepped up investment in Vietnam to benefit from trade investment policies, taking advantages of cheap labour cost and geographical location for trading. However, Vietnam's SIs are still weak to meet the technology and scale requirements, leading to the fact that these enterprises were forced to import materials from abroad. The contribution of value added from Vietnamese producers is very low in the value of final products, most Vietnamese suppliers in SIs only can provide low value-added auxiliary products due to weak technology such as packaging products, labels, nylon bags, screws ...

With the goal of providing 45% and 65% of the input material demand for domestic production in the period of 5 years from 2020 to 2025, creating clusters for domestic enterprise in SIs and participating in the international supply chain, the Vietnamese Government is supporting and focusing resources on the development of four main fields in the supporting industry: 1. Food processing, Textile Apparel and Leather – Footwear (TALF), 2. Electronics, 3. Fabricated metal and machinery and equipment, 4. Automotive. In which, focusing mainly on core scope is Electronics and Automotive because these auxiliary products bring high added value. In the long term, high-tech products will create positive conditions for Vietnam to develop domestic industries. In the past few years, fabricated metal and machinery and equipment industry has also been interested and developed strongly. However, upstream activities of SIs will be prioritized for development such as manufacturing components and spare parts, not downstream activities of SIs included assembly and outsourcing services for foreign companies as the past and currently. In the long-term, development opportunities in upstream process of manufacturing industries will create high added value when high technology is applied to production, labour cost or outsourcing costs become a less important factor and is no longer an advantage of Vietnam in the future.

2.1.2.1. Food processing, Textile Apparel and Leather – Footwear (TALF)

Textiles, garment, leather and footwear are Vietnam's well-known traditional auxiliary industries and are among the top 10 largest garment and footwear exporting countries in the world. According to the statistics of the Vietnam Leather, Footwear and Handbag Association (Lefaso), by the end of 2018, the Vietnamese leather and footwear industry has had a wide consumption market with more than 100 countries, including 72 countries with export amount is over 1 million USD. The United States, EU, China, Japan and South Korea are the five largest import markets of Vietnam, accounting for over 82.3% of total footwear exports in 2018. Although Vietnam's footwear export price is higher than many products of other countries, about 1.6 times average price of the world, but the export amounts in these years are still stable and steadily increasing. This shows that Vietnam manufacturers have enough ability to produce high-end products, good quality products that can be highly competitive and internationally recognized.

However, the current production of the Leather and footwear industry is still mainly in the form of outsourcing for export (up to 60-70% of the total footwear enterprises produce in the form of processing). Raw and input materials are provided and directed by importing customers, so the added value of processing activity into products is low and heavily dependent on supplies and customers from abroad.

In the textile and garment industry, the localization rate of new textile enterprises reaches around 40% ~ 45% currently. Fabrics used by the industry depend heavily on import sources. Vietnam's garment and textile industry currently produces about 2.3 billion m2 per year, only meets about 25% of the domestic market demand. The leather and footwear industry are estimated to account for 68% ~ 75% of the cost structure for footwear products. The number of domestic companies is illustrated nearly 70% of the total number of textile and garment manufacturing enterprises, but only produce approximately 35% of the total leather production in Vietnam.

With the goal of reaching from 21 to 22 billion USD in this year and over 30 billion USD in 2025, many companies in the industry are facing with a problem of lacking domestic raw materials and suppliers. Currently, there are 6 main types of raw materials needed to

supply for this industry: leather, faux leather, woven fabric, non-woven fabric, carton and shoe soles and all of them still depends heavily on foreign sources. Assuming that with the SIs of leather and leatherette production, when domestic demand is 210 million m2 per year, domestic enterprises are only supplying over 4% of total demand, equivalent to about 8.9 million m2 per year. The localization rate of synthetic leather and artificial leather is only about 30% and domestic manufacturers are having weak competitiveness because of high price and low technology to produce many types of leather that require high quality. It is reason why Vietnam have to import a large amount of leather fabrics from China, Korea, Italy and Taiwan. The domestic suppliers of woven and non-woven fabrics only meet over 10% of the total production demand with low-grade fabric products due to input materials (fibers, yarns…), textile technology, low weaving and dyeing technological machines. For auxiliary materials such as hooks, locks, threads and others, the localization rate is higher, about 50%. However, these materials contribute a low added value to the final products. Machinery and spare parts for this industry are still mostly imported from abroad (Italy, Switzerland, China and Japan), domestic enterprises only perform activities of repair, maintenance stages and installation.

2.1.2.2. Electronics

In recent years, the growth of Vietnam's electronics industry has been high and moving to become one of the key industries. By offering preferential policies for FDI corporations such as reducing import and export taxes, corporate income taxes as well as the attraction of abundant labour force Vietnam has successfully attracted many investors building factories in these years such as Samsung, LG, Canon, Intel, Panasonic, Toshiba, Sony ... It is undeniable that the competitive advantage of human resources with cheap labour costs is equal 1/2 compared with China and only 1/3 compared with India. In which, the Vietnamese population is a young population with about 60% of the population being in the working age from 17 to 60 years old. Vietnam is currently ranked 12th in the world and 3rd in ASEAN in terms of electronic exports with a value exceeding 70 billion USD (at the end of 2017).

Samsung Electronics Vietnam Co., Ltd is one of the largest FDI companies in Vietnam (currently owning smartphone and LCD screen manufacturing factories in industrial zones in the North of Vietnam) distributing for about 20.4% of the export structure in 2018 with revenue reached more than 216 billion USD and profit was over 52 billion USD. Samsung factories have big capacity and can produce about 160 million devices per year. In the mobile phone segment, the company has two manufacturing plants in Vietnam, providing 50% of the mobile phone quantity sold globally. However, currently there are only about 200 Vietnamese enterprises supplying to Samsung and mainly provide low value-added products such as glossy bags, packing materials (box, cartons, labels or cushion).

Demand for raw materials and spare parts for electronics manufacturing is very huge. But contrary to demand, Vietnam's localization rate in the electronics industry is approximately 5%. Most industrial groups are forced import spare parts, components and other materials from their vendors in mother countries or from developed countries such as EU, Korea, China and Japan. In addition to the fact that the production scale of domestic enterprises in Vietnam is too small to meet part of the demand, an important reason is the shortage of technology and production experience and capacity of domestic companies in SIs. Many input materials in the electronics industry require high precision, standard production process, strict quality control of each stage and high automation but the electronics supporting industry in Vietnam is still young and these companies start from fragmented production, old machines and technologies, and lack of investment in technology and automation.

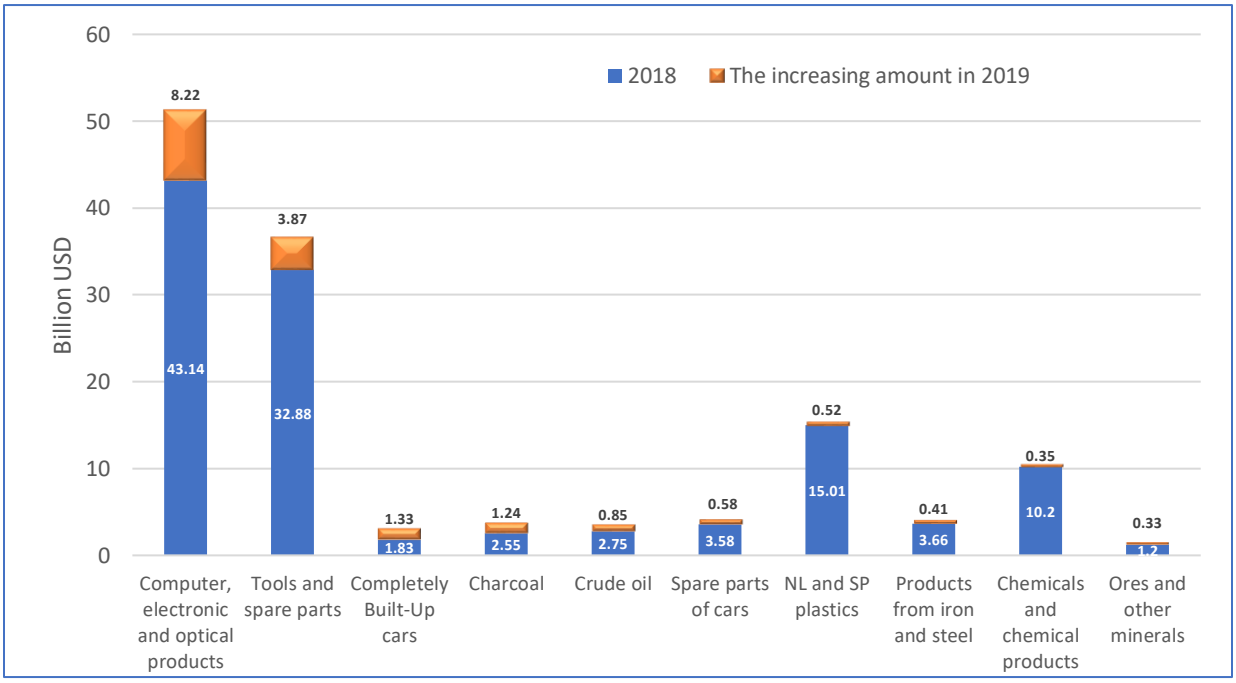
In recent years, in order to promote the domestic SIs and increase the localization of the electronics industry, many exhibitions and workshops have been organized by ministries and industries in cooperation with large corporations. The organization is looking for potential vendors but the efficiency is not high. The technological level of supporting enterprises in the manufacturing industry is too low, making them difficult to become suppliers of international corporations in the country and abroad. The actual situation shows that Vietnamese producers are still not capable enough to provide medium quality and medium technology products for the big manufacturing corporations, not to mention

supplying in the value chain of the high value-added components and higher technology products.

2.1.2.3. Fabricated metal and machinery & equipment

In recent years, the number of enterprises operating in the mechanical engineering industry and the SI in mechanical engineering industry has been increasing day by day due to the domestic industrial development demand. The figure for operating mechanical enterprises is nearly 30% of the total counted number of processing and manufacturing enterprises; create jobs for around 16% employees in processing and manufacturing enterprises.

Figure 2.3: The top ten import groups having the biggest increase in value in 2019



Source: General Department of Vietnam Customs

Looking at the reality, fabricated metal and machinery and equipment groups is one of the import products with big amount in Vietnam. This group is ranked 2nd in the top 10 groups of imported goods in the largest increase in value in 2019, just behind to groups of computers, electronics and components. The import turnover of this group is US $ 36.75 billion, up 11.8% compared to 2018. It shows that the asynchronous development of the industry and the mechanical support industry. While the development of the industry is fast and strong due to the investment of FDI corporations, the domestic mechanical support

enterprises cannot keep pace with development of the main industries to meet the demand for machinery and equipment. Machinery, equipment, tools and spare parts imported in 2019 mainly from: China reached 14.9 billion USD, up 28%; from South Korea reached US $ 6.16 billion, up 4.4% and from Japan reached US $ 4.69 billion, up 5.8% compared to 2018 (Figure 2.3). According to the General Statistics Office, exporting amount of these items was only $ 18.3 billion in 2019. Major importing markets for machinery, equipment, tools and spare parts in 2019 include the US with 5.06 billion USD, up 48.4%; EU market (28 countries) reached the value of 2.72 billion USD, up 22.9%; Japan with 1.94 billion USD, up 5.5% and South Korea with 1.63 billion USD, up 31.8% over the same period in 2018.

2.1.2.4. Automotive

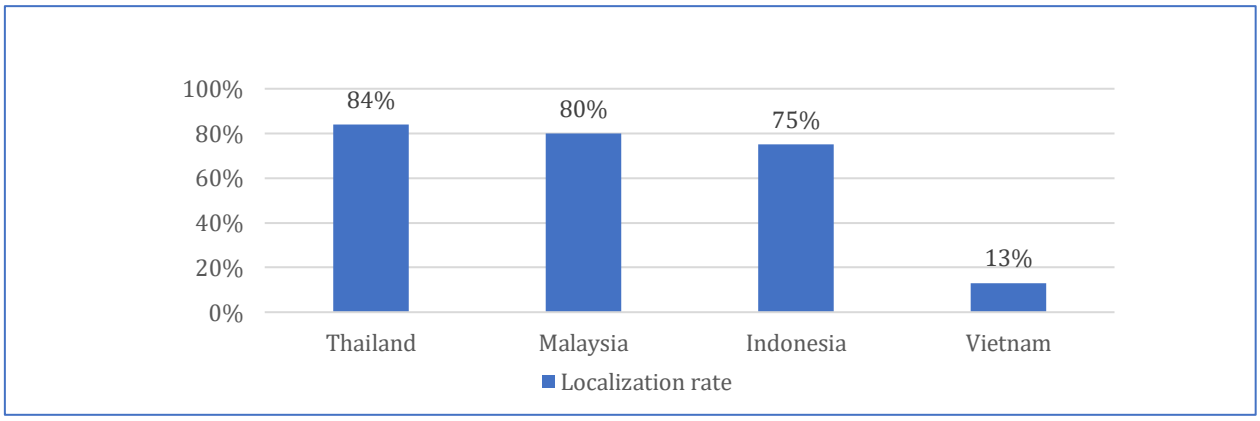
By the end of 2018 and base on the data from the Ministry of Industry and Trade, Vietnam recorded 358 automobile manufacturing enterprises: there are 50 automobile assembling companies, 45 manufacturers producing chassis and Body-on-frame of cars and motorbikes, 214 enterprises producing components and auto parts... There are a lot of local companies provide production and assembly services for famous international corporations such as Toyota, Hyundai, Kia, Mazda, Honda, GM, Chevrolet, Ford, Mitsubishi, Nissan, Suzuki, Isuzu, Mercedes-Benz, Hino… and meet about 70% of the demand for cars under 9 seats in the market of Vietnam. Great development opportunities have encouraged some domestic firms deeply involved in the global automotive production chain. The automobile industry has contributed billions of dollars per year for government budget and solved the problem of unemployment for hundreds of thousands of direct employees. However, the number of enterprises in this supply chain is too small compared to countries of ASEAN with developed automotive industry: Thailand have 2,500 supporting vendors in this SI or the figure in Malaysia is 385 enterprises. In addition, supporting the automobile industry in Vietnam can only produce simple components such as chassis, cabin, car door, tires, radiator, brake wire, electric wire, axles, wheel rims ... and competitiveness is recorded to be very weak.

Vinfast Manufacturing and Trading Co., Ltd. (Vinfast), Truong Hai Automobile Joint Stock Company (Thaco) and VEAM are the leading producers in Vietnam in the supply chain for SIs, especially the automobile and motorbike industry. Thaco is supplying 30-40% components for trucks and semi-truck, especially the car segment reached 10-15% and the

goal in near future is that the localization rate can grow up to 40%. Vinfast set higher target to cover more than 60% of domestic component demand for car. The achieve this target, Vinfast invested building factory to produce a tire body in Vietnam to increase the localization. On the side of FDI enterprises, Toyota has become a FDI auto corporation with a high localization rate of 37% and raising the localization rate has always been a top priority in Toyota Vietnam.

In the coming time, if Vietnam want to enjoy AFTA tax incentives to enhance product competitiveness, local companies need to raise localization rate to at least 40%. Base on the data of Vietnam Supporting Industry Association, there are about 300 automobile supporting enterprises currently, but 80% of them are FDI companies, most of the rest 20% Vietnamese enterprises have small-scale, difficult capital access, difficult to invest in technology. The local company now only can produce about a dozen types of 30,000 component types in this industry.

Figure 2.4: Localization rate of car industry in ASEAN



Source: General Department of Vietnam Customs

Seeing into positive side of the low localization rate, Vietnamese enterprises have more opportunities to participate in the supply chain when the domestic competition is low. The figure 4 illustrates there is a big gap of localization rate and material supplying opportunity between Vietnam and other countries with developed SIs in ASEAN, such as Thailand, Malaysia or Indonesia. These countries all have localization rates in automotive industry is over 70%. As a result, Vietnam's car prices are unable to compete because production costs are pushed up due to the import of most raw materials and components.

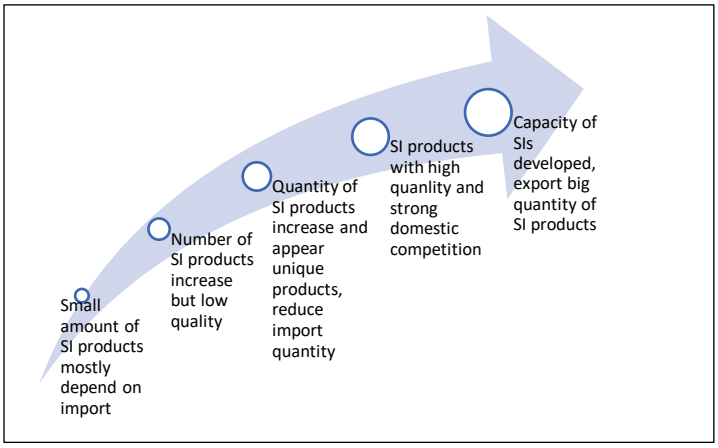
According to Toyota Vietnam, the low localization rate makes the production cost of Vietnam's automobile industry 10% higher than other countries in the region. And in the BMI report, the production cost of Ford Fiesta in Vietnam is 20% higher than other countries in ESEAN for the same reason.

2.2. General situation of supporting industries

2.2.1 Domestic supporting industries

Vietnam's SIs are in the process of developing and transitioning from the second stage to the third stage in the development process of supporting industry: from the number of products of the industry is small with low quality to increasing the quantity and quality of SI products to minimize dependence on imported materials from oversea vendors (Figure 2.5).

Figure 2.5: The process of supporting industry development



Source: Vietnam association for supporting industries

This process is being transformed quickly because of the strong push from the development of major industries in recent years. In the growth rate of the whole economy in 2019, the industrial sector is estimated to increase by 8.9% to reach the set target. This is a relatively high increase, reflecting declining industrial processing, the localization rate, the ability to take advantage of domestic raw materials of some industries in manufacturing and processing high. The index of industrial production (IIP- is an index which shows the growth rates in different industry groups of the economy during a particular time period with reference to a base time period) is estimated to increase by 9.1%, exceeding the set target for the whole industry since the beginning of the year (up 9%). The 4 main industries and supporting industries have been relatively high and stable growth, especially the Fabricated metal and machinery and equipment group has experienced a growth rate of over 10% in recent years,

showing the movement of main structure and strong investment in production technology of Vietnam.

Table 2.1: Index of Industrial production by industrial activity

Industries	Sub-sectors	2012	2013	2014	2015	2016	2017	2018	2019
Food processing, Textile Apparel and Leather – Footwear	Manufacture of textiles	104.2	121	119.7	114	116.9	109.8	112.5	111.4
	Manufacture of leather and related products	107.8	118.7	122	117	103.5	107.1	110.4	110.0
	Average	106	119.9	120.9	115.5	110.2	108.5	111.5	110.7
Fabricated metal and machinery & equipment	Manufacture of basic metals	106.4	98.2	109.9	112.1	117.9	122.1	125	128.6
	Manufacture of fabricated metal products (except machinery and equipment)	107.9	117	113.3	103	109.7	109.9	112	108.6
	Manufacture of machinery and equipment n.e.c	..	..	..	..	..	109.7	104.1	111.9
	Average	107.2	107.6	111.6	107.6	113.8	113.9	113.7	116.3
Electronics	Manufacture of computer, electronic and optical products	114.4	102.2	135.2	135.1	112.5	135.2	110.7	106.6
	Manufacture of electrical equipment	103.2	110.7	102.6	110.2	107.4	112.1	106.9	110.0
	Average	108.8	106.5	118.9	122.7	110	123.7	108.8	108.3
Automotive	Manufacture of motor vehicles; trailers and semi-trailers	108.9	113.9	123.1	127	117.5	102.8	116	107.3
	Average	108.9	113.9	123.1	127	117.5	102.8	116	107.3

Source: summarized by author (data source of Vietnam General Statistics Office)
** During 2012-2016 is in accordance with base year 2010; from 2017 is in accordance with base year 2015*

Unfortunately, reality proves that Vietnam's main industry is developing rapidly due to the attraction of investment from both domestic and foreign capital source but the SIs is still young. The amount of import and export is unbalanced for the main industries when factories located in Vietnam have to import most of the raw materials from abroad, this is also reflected by the low localization rate as the analysis shows on (Table 2.2). In 2018, FDI contributed over 70 per cent of the country's total export turnover, and in particular to those industries that witnessed the largest expansion: 100 per cent in telecommunications equipment, 95% in computers; 89% in machinery and equipment; and even footwear and apparel exports were largely driven by FDI, with shares of 79% and 60%, respectively.

Table 2.2: Localization rates of main industries (2019)

Industrial sectors	Localization rate 2019
Food processing, Textile Apparel and Leather – Footwear (TALF)	60%
Electronics	15%
Automotive	10~20%
High-tech industries	5%

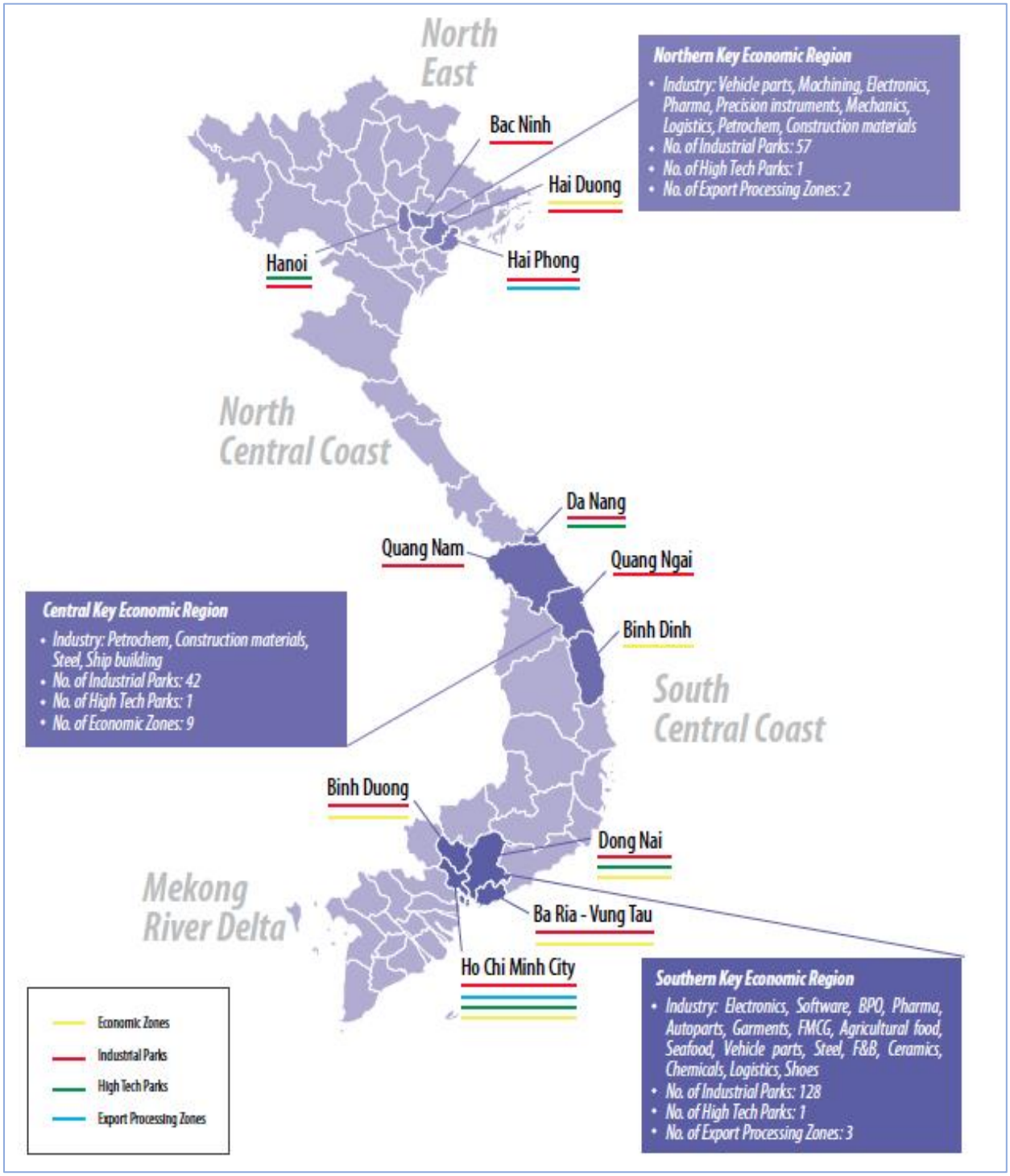
Source: General Statistics Office of Vietnam

Base on the data in a report of the Department of Economic Zones Management (Ministry of Planning and Investment), by the end of June 2017, Vietnam had 325 industrial parks established mainly concentrated in the North, the Middle and the South of Vietnam (Figure 2.6). The distribution of industries and the size of industrial clusters varies. At present, the South is focusing the most industrial clusters in the country with 128 industrial parts, and SIs and industries are mainly footwear, apparel, automotive, food (concentrated in 3 provinces and cities: Ho Chi Minh, Dong Nai and Binh Duong). The second largest industrial zone is in the North with auxiliary manufacturing for electronics and automotive, mostly in three provinces of Bac Ninh, Hai Phong and Thai Nguyen where many large electronics corporations such as Samsung and LG…Industrial zone in the Middle is mainly concentrated in companies of shipbuilding and steel manufacturing industries.

The Department of Industry (Ministry of Industry and Trade) statistics that our country currently has about 1,800 SI companies, of which 300 enterprises participate in the supply chain of multinational companies. Besides, the number of supporting industry enterprises accounts for about 4.5% of the total number of enterprises of processing and manufacturing industries. The number of enterprises with ancillary enterprises is small compared to demand and over 97% are SMEs, which are unable to produce materials for large corporations. Only 20% of them meet the criteria to engage in the global supply chain and 36 % of them can join the export-oriented production. Outputs of Vietnam's supporting industries solely caters to 25% ~ 30 % of overall demand for the industrial sectors. At the same time, the fact is that Vietnam has not built clusters for SIs yet. Supporting enterprises (SEs) operate sporadically and lack linkages and technology exchange while the establishment of clusters is not only important for the main industries but also for the supporting businesses. Because only when working together and develop together, the

overall SIs can develop quickly. Information, innovation and technology sharing is indispensable if you want to build a sustainable system of SIs.

Figure 2.6: Department of Economic Zones in Vietnam



Source: Dezan Shira & Associates

2.2.2 Comparison with other countries

With the movement of manufacturing investment out of China, Southeast Asia has an opportunity to become a new factory of the world when attracting FDI inflows because of the impact from the US-China trade war. Thailand, Malaysia and Vietnam are having great opportunities to develop existing SIs and participate in international supply chains. ASEAN countries continue to rise the ranking in global manufacturing competitiveness (Table 2.3) with abundant labour force, much cheaper than other countries such as Singapore, India, China, Korea, or Japan, rapid economic growth, many policies to attract investment and a stable political and economy environment.

Table 2.3: Global Manufacturing Competitiveness Index

2016			2020 (Projected)			
Rank	**Country**	**Index score (100 – High) (10– Low)**	**Rank**	**Country**	**Index score (100 – High) (10– Low)**	**2016 vs 2020**
1	China	100	1	United States	100	1
2	United States	99.5	2	China	93.5	-1
3	Germany	93.9	3	Germany	90.8	-
4	Japan	80.4	4	Japan	78	1
5	Republic of Korea	76.7	5	India	77.5	6
6	United Kingdom	75.8	6	Republic of Korea	77	-1
7	Taiwan	72.9	7	Mexico	75.9	1
8	Mexico	69.5	8	United Kingdom	73.8	-2
9	Canada	68.7	9	Taiwan	72.1	-2
10	Singapore	68.4	10	Canada	68.1	-1
11	India	67.2	11	Singapore	67.6	-1
12	Switzerland	63.6	**12**	**Viet Nam**	**65.5**	**6**
13	Sweden	62.1	13	Malaysia	62.1	4
14	Thailand	60.4	14	Thailand	62	-
15	Poland	59.1	15	Indonesia	61.9	4
16	Turkey	59	16	Poland	61.9	-1
17	Malaysia	59	17	Turkey	60.8	-1
18	**Viet Nam**	**56.5**	18	Sweden	59.7	-5
19	Indonesia	55.8	19	Switzerland	59.1	-7
20	Netherlands	55.7	20	Czech Republic	57.4	3

Source:House of Commons, UK (2016)

In Southeast Asia countries, Thailand is currently leading with the SIs, especially SIs for car industry. Malaysia also follows and there are many good policies to promote the development of SIs and clusters for SIs to establish supply chains for key industries. However, each country in the region currently has its own strengths and has seized great opportunities for SIs base on the big demand of raw materials for production of main industries. If Thailand has developed SIs in automotive, precision mechanical manufacturing cluster, and is an attractive market for FDI corporations to adopt and pilot Industry 4.0 solutions, Vietnam attracts with fast developing economics and potential for electronics, textile & garments and furniture SIs. Political stability, economic stability and geographical advantages (contiguous to China and favorable geography for international trade) are favorable for businesses that are on the way of shifting FDI investment capital to Vietnam. Indonesia have big advantages by human resources and consumer markets. This country is a good choice for companies looking to adopt an in-market manufacturing approach. Malaysia have an attractive geographical location for producers which want proximity to headquarters and invest in Singapore but have difficulties with land constraints.

The rapid development in Vietnam compared to other countries in the region is also reflected in the number of establishments in the subsectors of the main industry (Table 2.4). It shows that the number of Establishments in Vietnam is much higher than other countries ASEAN and has the potential to be able to create clusters in SIs, especially for the manufacturing industries that Vietnam is focusing on such as Manufacture of textiles and wearing apparel, Manufacture of electrical equipment, Manufacture of transport equipment and Repair and installation of machinery and equipment.

Although Vietnam is limited in competitiveness with other countries having developed SIs in the region like Singapore or Thailand with strong and high technology enterprises, Vietnam still has great potential to develop faster. Over 97% of all enterprises in Vietnam's supporting industry are micro, small and medium but with appropriate development and support policies, Vietnamese medium-sized enterprises completely could expand production, innovate and develop to become key suppliers for international corporations and participate in global supply chains as the case of Thailand in automotive industry development.

Table 2.4: Number of Establishments in ASEAN by Division of Industry

Divison of Industry	Brunei Darussalam	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
	2015	2011	2016	2015	2018	2015	2017	2018	2018
Manufacture of food products	61	27,624	7,708	8,063	28,556	10,118	942	9,423	197,066
Manufacture of beverages	6	4,433	696	432	1,165	2,454	-	857	82,659
Manufacture of tobacco products	33	777	26	126	14	-	25	28	-
Manufacture of textiles	23	8,919	2,481	1,224	2,013	369	109	2,620	38,804
Manufacture of wearing apparel	299	15,928	3,595	7,512	1,217	1680	400	2,194	113,435
Manufacture of leather	277	1,141	375	239	290	22	1,013	8,917	-
Manufacture of wood and wood products, excluded furniture; manufacture of articles of straw and plaiting materials	17	1,955	1,678	1,794	2,431	509	172	6,068	136,971
Manufacture of paper, paper products	35	805	936	343	355	94	1,346	12,488	-
Printing and reproduction of recorded media	28	283	1,266	3,213	555	1,562	852	2,621	11,070
Manufacture of coke and refined petroleum products	3	2	134	124	111	15	18	-	460
Manufacture of chemicals and chemical products	5	144	1,500	1,473	320	591	279	3,557	6,828
Manufacture of basic pharmaceutical products, pharmaceutical preparations	2	10	402	371	76	285	54	424	711
Manufacture of rubber and plastics	4	46	2,517	2,628	1,318	844	280	8,921	9,349
Manufacture of other non-metallic mineral products	26	2,823	2,046	2,072	1,664	720	137	7,701	26,638
Manufacture of basic metals	6	37	707	1,557	680	357	38	1,106	3,105
Manufacture of fabricated metal products (except machine, equipment)	27	4,713	1,599	5,376	2,888	1,175	1,221	12,940	124,370
Manufacture of computer, electronics	4	406	985	-	291	335	1,009	2,022	-
Manufacture of electrical equipment	4	8	536	999	117	207	242	2,873	1,852
Manufacture of machinery, equipment	20	637	1,940	258	242	1,733	5,329	2,364	-
Manufacture of motor vehicles, trailers and semi-trailers	3	640	742	65	228	89	2,771	745	-
Manufacture of other transport equipment	2	81	544	380	275	132	931	525	1,929
Manufacture of furniture	12	1,195	1,797	2,521	585	980	626	3,798	105,597
Other manufacturing	1	1,827	1,034	1,490	585	395	522	14,026	10,944
Repair and installation of machinery and equipment	24	926	517	2,868	7,130	628	-	-	14,213
All Industries	**550**	**71,326**	**35,163**	**49,101**	**52,717**	**24,441**	**9,096**	**91,147**	**912,565**

Source: ASEAN Secretariat, Association of Southeast Asian Nations (ASEAN), ASEAN Statistical Yearbook 2019

2.1.3 The role of supporting industries for the economy

Firstly, one of the SIs' contributions to the economy is attracting international investment and FDI enterprises. If cheap labour cost was previously an attractive investment factor, especially for assembly and outsourcing activities, it is no longer a major attraction for global investors in the future. The ratio of SI product costs is much higher than the ratio of human resource costs, which means that if a country does not have developed SIs, cheap labour cost also become a poor interesting investment environment. Large corporations nowadays focus more on countries with developed SIs because it not only meets the needs of purchasing raw materials, components, equipment, reducing production costs to increase competition but also minimize risks to the import of raw materials and supplier management. In recent years, thanks to the policies of attracting investment and abundant and cheap labour force, the number of FDI enterprises in Vietnam has been increasing significantly, but in the long run if Vietnam's SIs does not keep up with the growth of major industries, these corporations can completely withdraw and move factories to other countries with a more attractive investment environment.

Secondly, SIs help motivate the development of main industries and are the basis for promoting the global industrial integration of in Vietnam. SIs are the factors that create added value for the main industry and accelerate the industrialization process. If the SIs is underdeveloped, the major industries will be affected because it depends on the quality and cost of products (input materials) that manufactured from the SIs. The SIs is also a link in the international production chain. The development of SIs will give domestic companies the opportunity to cooperate and work with many multinational corporations and participate in global supply chains.

Thirdly, SIs contributes to promoting the development of high production technology. The deepening of specialization in industry leads to increasing technological requirements to create quality and competitive products. It motivates businesses in the supply chain to invest in technology, science and innovation as well as research to create quality products and be better than competitors. The investment in high-tech machines and high-quality human resource to improve production levels is focused on promoting the development of production technology. In addition, international corporations when building production

plants abroad also have a strong motivation in technology transfer, helping domestic manufacturers develop in order to improve their supply chain for input materials. There is always a mutual relationship between FDI enterprises and enterprises in SIs, both for mutual development and mutual benefit.

Fourthly, the development of SIs also contributes to socio-economic stability of every country. When manufacturers and firms can produce spare parts and components of products, it means that they no longer have to import to serve production and decrease dependence on oversea vendors which will have an impact directly on limiting trade deficit and increasing foreign currency value, reduce inflation and stabilize the macro economy at the same time. The development of automatic SIs will raise the localization rate, reduce industrial production costs, and promote industrialization. Moreover, it will create the positive effect for other industries to develop, create jobs, make value added for the economy, stimulate domestic consumption, contribute to economic growth and reduce the poverty rate.

2.3. Analysis of supporting industry in Vietnam

2.3.1 Main problems of supporting industry in Vietnam

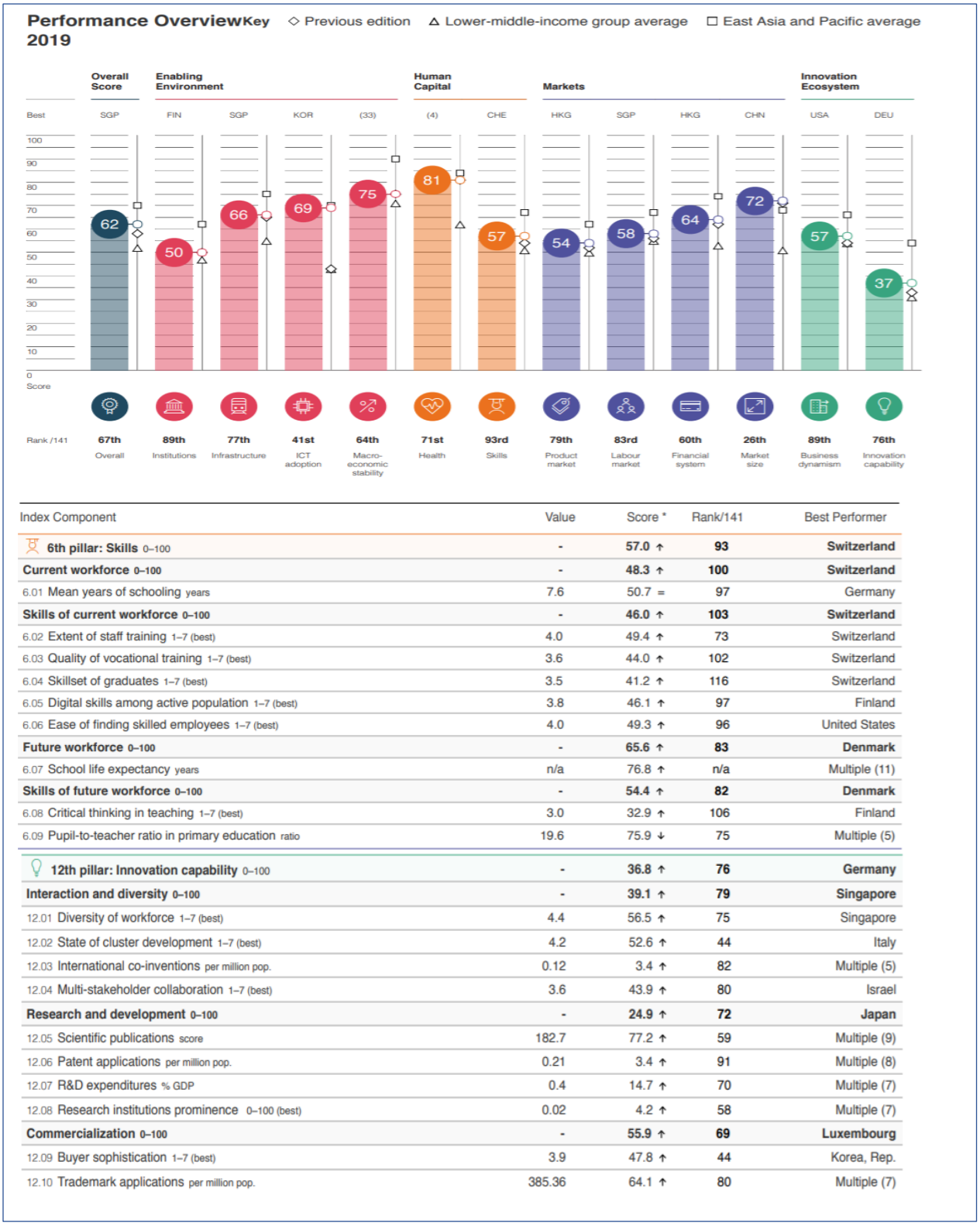
The first problem mentioned is that the number of enterprises in the SIs in Vietnam is too small and most of them are FDI enterprises. While countries with strong SIs create cluster areas to support and grow rapidly, auxiliary enterprises in Vietnam are young and do not have close links. According to the Ministry of Industry and Trade, Vietnam currently has about 1800 enterprises operating in SIs, but over 97% are small and medium organizations. In which only about 300 enterprises are participating in the international supply chain, the rest is only provided to the domestic factories.

The next problem comes from the internal of enterprises, which is the capacity of SEs in Vietnam. Currently the gap between the needs of multinational corporations and what domestic SEs can supply is too far. While the requirements of corporations are high technology and high product quality, Vietnamese producers are unable to adapt, both in terms of quality and quantity provided. If comparing to other countries in East Asia and Asia – Pacific (Figure 2.7), the quality of labour force in Vietnam is still at a low level. Although

there has been an improvement in the past, most Vietnamese workers are still unskilled and non-professional workers. The average number of years trained and skilled do not meet the demands of highly skilled workers, especially in automation and high-tech industries. Vietnamese companies not only have limited access to high quality labour, but also have significant technological and innovation limitations. While developed countries have always focused on innovation capability, Vietnam has not invested too much in R&D and innovation. The main reason is that most of Vietnamese small and medium enterprises in supporting industry are lacking capital to invest in production and therefore they can spend resources to invest and develop technology. Besides, the experience in improving both machines and production processes is low. Business owners are not familiar enough with and understand how the importance of innovation contributes to the success of production and their companies. Learning from foreign enterprises is essential because they have a standard production process and the R&D department is always invested and focused.

Another major issue that comes from outside the firms is the government's policy towards SIs. Although there are provisions on increasing the localization rate for FDI enterprises investing in Vietnam, it is almost ineffective. While demand is outstripping supply, why are Vietnamese SMEs not investing in development in the face of such opportunities? The first barrier is capital. According to enterprise owners, Vietnam has many shortcomings and obstacles that the current regulations of the law cannot solve to create strong mechanisms and policies to promote the development of SIs. Credit policy is one of the major problems many companies encounter particularly. SI manufacturers do not have enough assets to mortgage for loans; financial statements are not feasible due to the large initial investment, loan documents are difficult to convince credit agencies, etc…the result of this issue is that producers are very difficult to access credit sources. Specific policies to help SIs enterprises overcome these difficulties. Even when they are eligible for loans, high interest rates have reduced the competitive advantage of domestic companies. While FDI corporations have many opportunities to borrow investment capital from foreign banks or from their home countries with interest rates only from 1% to 3%, Vietnamese companies are suffering from 8% to 10%.

Figure 2.7: Performance of Vietnam (Labour skills and Innovation capability)



Index Component	Value	Score *	Rank/141	Best Performer
6th pillar: Skills 0–100	-	**57.0** ↑	**93**	**Switzerland**
Current workforce 0–100	-	**48.3** ↑	**100**	**Switzerland**
6.01 Mean years of schooling years	7.6	50.7 =	97	Germany
Skills of current workforce 0–100	-	**46.0** ↑	**103**	**Switzerland**
6.02 Extent of staff training 1–7 (best)	4.0	49.4 ↑	73	Switzerland
6.03 Quality of vocational training 1–7 (best)	3.6	44.0 ↑	102	Switzerland
6.04 Skillset of graduates 1–7 (best)	3.5	41.2 ↑	116	Switzerland
6.05 Digital skills among active population 1–7 (best)	3.8	46.1 ↑	97	Finland
6.06 Ease of finding skilled employees 1–7 (best)	4.0	49.3 ↑	96	United States
Future workforce 0–100	-	**65.6** ↑	**83**	**Denmark**
6.07 School life expectancy years	n/a	76.8 ↑	n/a	Multiple (11)
Skills of future workforce 0–100	-	**54.4** ↑	**82**	**Denmark**
6.08 Critical thinking in teaching 1–7 (best)	3.0	32.9 ↑	106	Finland
6.09 Pupil-to-teacher ratio in primary education ratio	19.6	75.9 ↓	75	Multiple (5)
12th pillar: Innovation capability 0–100	-	**36.8** ↑	**76**	**Germany**
Interaction and diversity 0–100	-	**39.1** ↑	**79**	**Singapore**
12.01 Diversity of workforce 1–7 (best)	4.4	56.5 ↑	75	Singapore
12.02 State of cluster development 1–7 (best)	4.2	52.6 ↑	44	Italy
12.03 International co-inventions per million pop.	0.12	3.4 ↑	82	Multiple (5)
12.04 Multi-stakeholder collaboration 1–7 (best)	3.6	43.9 ↑	80	Israel
Research and development 0–100	-	**24.9** ↑	**72**	**Japan**
12.05 Scientific publications score	182.7	77.2 ↑	59	Multiple (9)
12.06 Patent applications per million pop.	0.21	3.4 ↑	91	Multiple (8)
12.07 R&D expenditures % GDP	0.4	14.7 ↑	70	Multiple (7)
12.08 Research institutions prominence 0–100 (best)	0.02	4.2 ↑	58	Multiple (7)
Commercialization 0–100	-	**55.9** ↑	**69**	**Luxembourg**
12.09 Buyer sophistication 1–7 (best)	3.9	47.8 ↑	44	Korea, Rep.
12.10 Trademark applications per million pop.	385.36	64.1 ↑	80	Multiple (7)

Source: Klaus Schwab, World Economic Forum, The Global Competitiveness Report 2019

About loan interest rates, taxes are also a barrier that inhibits Vietnamese SMEs to expand their production and firm size. The fact that large corporations are subject to higher taxes creates an obstacle for SMEs in order to invest and become bigger businesses. Besides, corporate income tax or import and export tax that local companies pay is also higher than FDI enterprises because of the tax support of Vietnamese government. International corporations also have many advantages when importing raw materials compared to buying domestic materials because export enterprises buy raw materials from domestic manufacturers are required to pay VAT 10% in advance, then when they export finished products, they can make deduction. Meanwhile, if enterprises do export goods and import materials from oversea vendors, they do not have to pay VAT in advance and will be short of the government within 90 days, then calculate it by temporary import for re-export. So, they don't have to pay this tax.

In the coming years, in order to achieve the goal that SIs can develop and catch up with the development of major industries, it is necessary to change and adjust the supporting laws and policies. Especially, putting these policies into the real life should be focused by the government and Ministry of Industry and Commerce Vietnam, not just the paper-based support rules and not being implemented in reality.

2.3.2 Development opportunities

Vietnamese SIs are having a greater opportunity than many countries in the ASEAN because of the current situation of lacking supply sources. The shortage of components and input materials of FDI enterprises in key industries such as electronics, automobile assembly, garments and textiles… is creating momentum in business for Vietnamese companies to seize chances to participate in the global supply chain.

The shortage of materials is most evident in the difference between the trade balance of import and export of materials and the low localization rate. According to the Ministry of Industry and Trade, SIs currently import nearly 80% of raw materials, spare parts and components. The localization ratio of the automobile industry is just 5% ~ 10%, while for the motorcycle industry it is from 40% to 70%. Some FDI investors is seeking domestic suppliers every year. International corporations like Samsung, Panasonic or LG constantly organize workshops to search for material suppliers in Vietnam to minimize the proportion

of dependence on imported raw materials, especially from China. In 2019, the total import of electronic components will reach 40 billion USD, the three largest countries are South Korea 42%, China 34% and Japan 4.2%. Textile, garment and leather product industry also depend on suppliers in China with importing 2.47 billion USD worth of cotton, 2.3 billion USD of fiber and yarn, 12.69 billion USD of fabric, and about 5.61 billion USD of textile and footwear materials last year. Truck manufacturers imported over 70% of components from China and spent 4 billion USD automobile spare parts to serve domestic automobile assembly and manufacture at the same year.

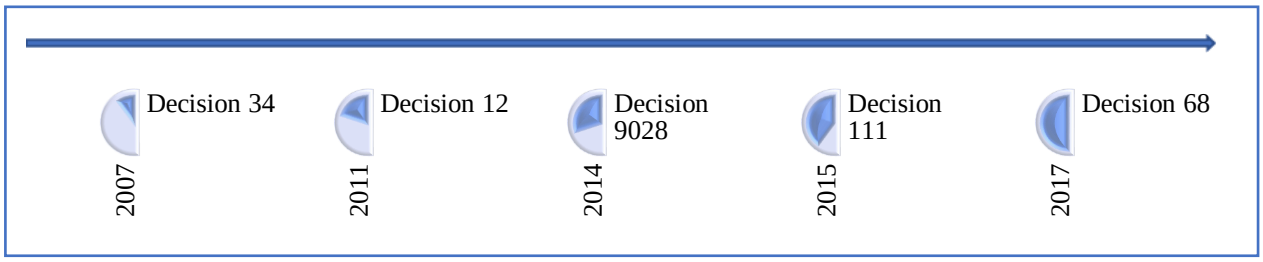
In recent years, FDI enterprises have had difficulty in finding suppliers to meet the localization rate as committed to the Vietnamese government when registering for investment. Most of these corporations cannot reach the agreed rates. This is one of the opportunities for Vietnamese producers to compete with international suppliers. If it is possible to manufacture products that meet same quality and equal price with international vendors, Vietnamese enterprises have a much better advantages than international competitors. Due to not only the pressure of localization programs but also by the many benefits it brings for companies belong to main industries from domestic supply (reducing transportation costs, storage costs: replace from POs (weekly or monthly purchase orders) into DOs (Daily orders), no need safety stock, logistics risks, other risks related to product quality or handling issues of NG products such as shipping pack to vendors, replace NG materials).

2.3.3 Policies and vision for development of supporting industries

In January 2017, the Prime Minister of Vietnam issued the Decision No. 68/QD-TTg on approving the program of developing SIs from 2016 to 2025 with the goal of manufacturing SI products for domestic production and export, participating in global value chains on purpose. By 2020, supporting industrial products will meet about 45% of the demand for domestic production, by 2025, this number will be grown up to 65% of the demand for domestic production. In the period from 2020 to 2025, this program focuses on developing SIs in three main areas: components and spare parts, textiles - footwear and SIs for high-tech industry.

If the Decision 68 in the year 2017 supplements, sets the direction and goals for Vietnam's supporting industry in the future, the Decision No. 111/2015 / ND-CP, issued in November 2015, provides more specific policies to develop SIs and incentives for businesses investing and operating in the SIs in Vietnam about Research development and technology transfer, Human resource development and Credit and tax incentives.

Figure 2.8: List of policies for supporting industries in Vietnam



Source: author

Research development and technology transfer: Projects on testing production of auxiliary industrial products shall be supported by the Government up to 50% of the funding. The project of constructing facilities for research and development of production of supporting industrial products is allocated or leased land by the Government and is entitled to land use incentives in accordance with the land law. To be considered to support up to 50% of the investment in research equipment from the supporting industry development program. The Government shall support up to 75% of the technology transfer funding for projects on the production of materials using over 85% of raw materials being products of domestic deep processing of minerals, including metal ores, non-metal, petrochemical products for SI products.

Human resource development: individuals who directly perform the tasks of the SI Development Program are given priority to train and improve their skills at home and abroad according to the state programs. Human resource training establishments serving the production of products of SIs are funded by the Science and Technology Fund and other funds. The State encourages existing universities, research institutes and vocational training institutions to participate in the training of human resources for SIs.

Credit and tax incentives: Projects of manufacturing supporting industry products on the list of development priorities are entitled to loans with investment credit interest from

the government's investment credit. SMEs producing products on the priority list may borrow up to 70% of the investment capital at credit institutions on the basis of the guarantee of credit institutions when fully meeting the following conditions: The total value of collaterals accounts for at least 15% of the loan value, has at least 20% of equity to invest, and at the time of the guarantee request, there are no outstanding debts related to the home budget. countries, bad debts at credit institutions or other economic organizations. There are also preferences on import duties, VAT and other corporate income taxes such as an exemption on import tax for imported machines or equipment for productions.

The Vietnamese government in turn should offer conditional policy actions provided that foreign producers will make efforts as promised and such policies are consistent with external trade commitments (AFTA, WTO, USBTA, etc.). They should include tariff rates and special measures to encourage domestic parts production. The targets and the policies should be mutually dependent and based on best available forecasts of the industry and the market. The two must mesh closely for successful localization.

In addition, the Government has also issued provisions to encourage international cooperation on SIs and market development for products on the list of priority SI products (priority to join imprisoned in the national trade promotion program, partly supporting the cost of trademark registration, funds for participating in domestic and foreign trade fairs, funds for accessing market information and service fees from the develop supporting industry program) and establish SI development centres and programs to help enterprises in the industry.

Chapter 3 Vietnamese Medium-sized enterprises in supporting industries

3.1. Supporting enterprises overview

3.1.1. Supporting enterprises in ASEAN

Although the definition of company size varies from country to country, there is not much difference in the criteria for evaluating and classifying firm size. Asia, especially the Asia Pacific region, has been attracting strong attention from international investors and large corporations in recent years as the number of new businesses has been growing rapidly compared with other regions of the world when it was recorded nearly 71 million companies in operation by the year 2019 (Table 3.1). However, there are more than 76 million firms with small and micro scale, accounting for 99% of the total number of companies. MEs in the East Asia & Pacific region account for only 0.4%, much lower than other regions such as Europe & Central Asia, Latin America & Caribbean or Sub-Saharan Africa, which usually have about 1.2 ~ 2.4% medium sized businesses. This is understandable when the manufacturing and SIs in East Asia & Pacific are young and on the way of development.

Table 3.1: Number of Enterprises in 2019

Region	Population, total	Number of Enterprises				
		Micro	Small	Medium	Large	Total
East Asia & Pacific	3,816,382,058	71,278,200	5,397,165	311,648	106,090	**77,093,103**
Europe & Central Asia	1,442,501,864	36,588,705	2,478,093	932,518	73,963	**40,073,279**
Latin America & Caribbean	1,901,434,689	30,038,095	2,290,063	422,628	106,323	**32,857,108**
Middle East & North Africa	448,194,717	9,556,922	837,011	74,179	52,201	**10,520,313**
North America	1,323,244,991	32,077,536	1,460,492	191,140	23,390	**33,752,558**
South Asia	1,704,089,032	74,550,261	1,421,656	39,683	8,818	**76,020,418**
Sub-Saharan Africa	1,078,566,946	44,571,068	1,834,716	533,284	7,794	**46,946,861**

Source: World Bank group, International Finance Corporation (IFC), The MSME Economic Indicators Database 2019 report

Until 10 years ago, there were not many big and famous manufacturing and technology companies from Southeast Asia. Currently, it is a great destination for many large corporations come, invest and expand their production, leading to the need to develop related SIs. A big quantity of MNCs, FDI companies and local start-ups is quickly established thanks to technology launchers and the huge demand of materials for key industries. In a recently published research, many economic organizations including the Asian Partners Fund Management predict the golden age of Southeast Asian companies is coming in the next decade. Southeast Asia is receiving a big investment not only by the fast growing

manufacturing market but also by the opportunity for the consumer market with a total population of over 650 million people and an estimated gross domestic income of over $ 3,100 billion in 2019 from eight largest countries with high economic growth rate are Singapore, Indonesia, Thailand, Vietnam, Malaysia, Myanmar, Cambodia and the Philippines. According to information from Asia Partners, the compound growth rate of GDP in the region has been 8.6% in the past 20 years with the average income per capita ratio in Southeast Asia in the next decade expected at 4,600. USD / year, equivalent to China's average income per capita in 2007. That is also the year China built a lot of big technology companies, now they are the world's leading firms like Alibaba or Tencent... In the next decade, as the income of Southeast Asian people continues to rise, this is an opportunity for companies to develop faster with a regional vision. Moreover, Southeast Asia is considered as an economic area with a stable growth with rapid urbanization rate, a young population, and especially less affected by the economic crises for the last 20 years. The report points out some development indicators that show the advantages of Southeast Asia's general business environment. The most significant of which is the effort to create a common economic area with advantages in labour and market, creating the most favorable conditions for businesses with regional development strategies instead of just targeting one specific market.

Table 3.2: Number of Enterprises in Southeast Asia 2019

Country	Year	Population, total	Number of Enterprises							Enterprise/ per 1,000 people	Current Volume of MSMEs / GDP
			Micro	Small	Medium	SMEs	MSMEs	Large	Total		
Indonesia	2017	263,991,379	62,106,900	757090	58,627	815,717	62,922,617	5,460	62,928,077	238	7%
Thailand	2016	69,037,513		2989378	15,301		3,004,679	9,025	3,013,704	44	29%
Malaysia	2015	30,723,155	693,670	192783	20,612	213,395	907,065	13,559	920,624	30	24%
Philippines	2016	103,320,222	820,795	86955	4,018	90,973	911,768	3,958	915,726	9	0%
Cambodia	2014	15,270,790	501,612	10648	610	11,258	512,870	889	513,759	34	3%
Vietnam	2015	93,571,567	303,937	120830	11,041	131,871	435,808	6,607	442,415	5	6%
Myanmar	2014	51,924,182	110,754				128,094		128,094	2	4%
Lao PDR	2013	6,494,557					124,510		124,510	19	4%
Brunei Darussalam	2008	379,252	4,673			4,112	8,785		4,673	12	
Timor-Leste	2004	996,698	3,008	1071.99	58	1,130	4,138	17	4,155	4	1%
Singapore	2018	5,612,253					263,900	1,300	1,300	0	
Total Southeast Asia		641,321,568	64,545,349	4,158,756	110,267	1,268,456	69,224,234	40,815	68,997,037	108	

High income: HI, Lower middle income: LMI

Source: World Bank group, International Finance Corporation (IFC), The MSME Economic Indicators Database 2019 report

It can be seen in Table 3.2, Thailand is the leading country in the region for SIs. The revolution of Thailand's automotive and electronics industry in the past decade helps Thailand become to a hot spot for industrial manufacturing in Southeast Asia-Pacific. While the contribution of MSMEs to the national economy is the second to Indonesia, Thai MSMEs show outstanding performance when their total turnover accounts for 29% of the GPD, while almost other countries in the region account for less than 10% of GDP. Thailand is the one of ASEAN's largest manufacturing centers in the field of automotive and electronic industries and created successfully SIs. Thai products are popularly consumed in many markets around the world with reasonable prices, high quality and durability have improved significantly over time. The automotive industry is an important sector for the Thai economy, with great contributions to exports and trade flows. It is Thailand's second largest export sector, after the export amount of electronic spare parts and components. It can be said that the policies to promote and build industry of Thailand in general and SIs in particular have been really effective, the automobile industry has affirmed its competitive position and is able to compete with other international equipment manufacturers.

As the largest automobile manufacturing center in ASEAN, opportunities in Thailand's automotive electronics market are increasingly apparent as the country goals to become one of the leading eco car manufacturing centers of the world. The electronics industry has improved a range of factors in the automotive industry including safety, fuel efficiency, performance and comfort. Moreover, the current trend of alternative fuels, increasing fuel efficiency and stricter emissions standards is increasing leading to the demand of environmentally friendly vehicles increases. The value of the global automotive electronics industry is forecast to reach 314.4 billion USD in 2020, supported by the trend of developing smart cars. What is the reason making the success of this industry for Thailand?

From a macro perspective, the main reason and foundation for the development of Thailand's automotive and electronics industry comes from the domestic supply chain, or the supply chain of SIs. Mr. Banja Junhasavasdikul - Executive Chairman of Innovation Group, specializing in supplying rubber and polymer components for Thailand's leading car industry - said that the SIs for Thai cars was formed. Over the past three decades, Thailand has imposed an 80% import tax on cars and 60% on motorbikes to keep manufacturing plants in the country. From the 1990s, when the Thai government started to build SIs with a

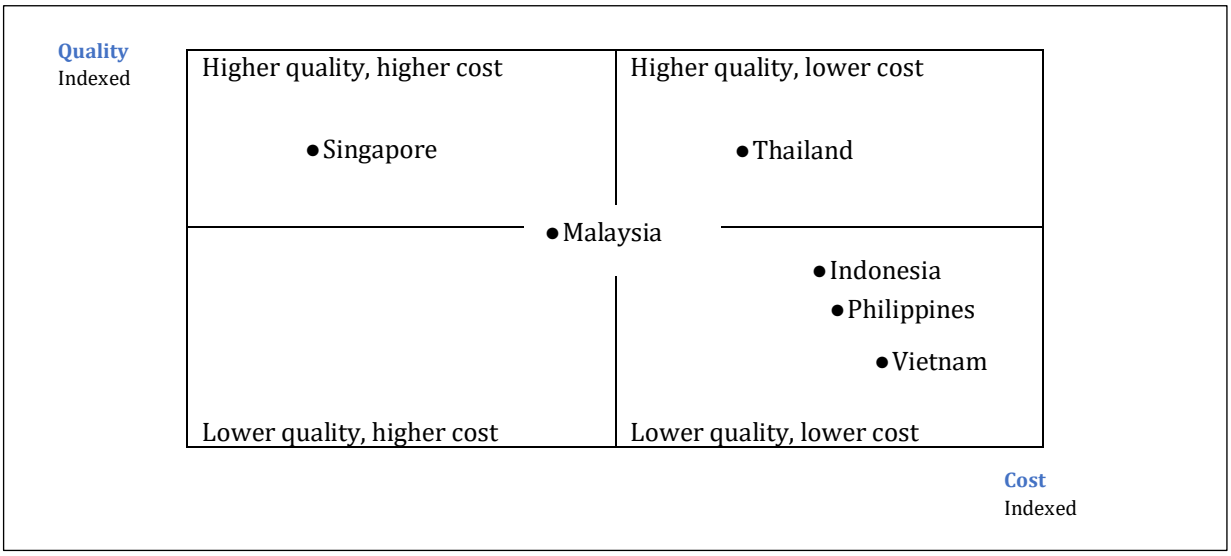
series of effective policies. The first is that they increased taxes strongly on imported vehicles as well as investing heavily in infrastructure and roads. Highways and multi-lane roads are created to reduce congestion, ready for large car lanes to travel. Supermarkets and condominiums, when planning to build, must have parking garages, gas station want to open must be large enough (including convenience store + toilet) for the car to fill up gasoline to stop... This policy is to ensure that Thai-made cars are preferred by the Thai and have a place to use conveniently. In manufacturing, the Government also charges different tax rates on the localized components of cars. In addition to tax policies to protect domestic enterprises, policies to increase the localization rate of the automobile industry have reduced production costs and enhanced the competitiveness of Thailand industries. The result is only 20% of spare parts produced by factories in the car support industry are for export, the remaining 80% is supplied for domestic car manufacturing factories.

Compared with Vietnam as a country in the process of building SIs, the domestic market should be given priority. Vietnamese people have buying power but tax policies do not support people owning cars. Meanwhile, infrastructure is still a problem of Vietnam and inadequate development as the requirement. Thailand also allocates ports and airports in a convenient location with export activities. Unlike Indonesia and other competitive markets, Thailand produces most of its auto parts domestically - with about 1,500 suppliers, so there is no need for imports. In addition, free trade agreements with 9 ASEAN countries also bring advantages to Thailand. Accordingly, car manufacturers in this country enjoy a tax rate of 0% or a significant reduction when exporting in ASEAN. Another great point of Thailand is that it has cheaper labor costs than developed countries and China, though not as cheap as other Southeast Asian countries around. However, the country's workforce is judged to be skilled and experienced.

Following Thailand, the success of Malaysian SIs is another successful story. With a relatively high number of SMEs per population (30 SMEs per 1,000). Malaysian SMEs are contributing 25% of the nation's GDP daily, only 5% lower than Thailand. SIs in Malaysia are highly valued for their policies of early development, especially those that support SI companies and improve the quality of labor. Firstly, it is the establishment and operation of the Penang Skills Development Center (PSDC) in 1989. PSDC is responsible for improving the level of workers in industrial companies. PSDC also provides up-to-date modern

technology, which benefits the domestic industries. It offers an initiative on global supply programs (GSPs) that help reduce the information gap between MNCs and local component suppliers. Due to the combined impact of technology improvement and information gaps, PSDC has contributed to the development of links between MNCs and SMEs operating in the field of development industry.

Figure 3.1: Auto original equipment and components manufacturing



Source: McKinsey analysis (Oliver Tonby, Jonathan Ng, Matteo Mancini) Understanding ASEAN: The manufacturing opportunity, McKinsey Productivity Sciences Center October 2014.

Another program, the Supplier Development Program (VDP) was implemented in the early 1990s. It aims to develop an SME network that specializes in supplying components to larger companies. Subsequently, the government implemented the Subcontract Exchange Program (SES), with the aim of helping exchange databases between SMEs and large enterprises, in order to coordinate supply-demand in the development sector. In 1996, Malaysia established the Small and Medium Industrial Development Company (SMIDEC), with the task of promoting and supporting SMEs in technological development research and acquisition of new technologies from abroad. In addition, SMIDEC also provides financial support, market access, service consulting, structure and more. Thanks to these supports, MNCs in Malaysia have a relatively high rate of domestic procurement (domestic components purchase). For example, the domestic procurement ratio of Sony EMCS Company in Penang has reached an average of 30% ~ 40%, which is approximately the

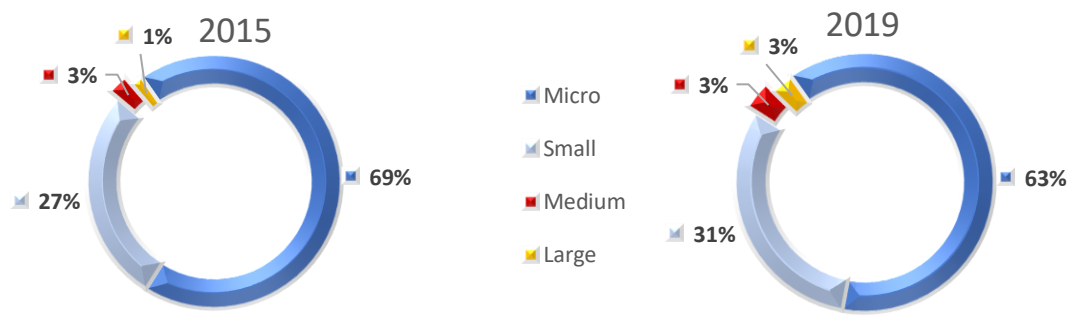
average of Japanese investment companies in terms of domestic procurement ratio in the world (40.3% in 2003).

Products of SIs in Vietnam compared to other countries in ASEAN have great advantages of price, but quality and technology are still low. Most of SIs are small and produce in limited quantities, it is difficult to meet the demand and requirement for large volume or mass production. That is one of the main barriers that Vietnamese SIs cannot develop, compete with foreign enterprises and participate in the international supply chain.

3.1.2. SIEs in Vietnam

By the end of 2018 and early 2019, Vietnam has more than 612 thousand companies operating throughout the country. According to the statistics of Business Registration Management Department (Ministry of Planning and Investment), in the period of 2016 - 2019, Vietnam has more than 126,000 newly established enterprises each year, increases 1.6 times compared to the period 2011-2015.

Figure 3.2: Number and Size of Enterprise in Vietnam (2015, 2019)



Year	Number of Enterprises				
	Micro	Small	Medium	Large	Total
2015	303,937	120,830	11,041	6,607	442,415
2019	382,444	189,879	21,306	17,008	612,656
Growth rate	26%	57%	**93%**	**157%**	38%

Source: General Statistics Office of Vietnam, 2019

In 2019, the General Statistics Office recorded 138,100 newly registered enterprises with a total capital of over 1,730 billion VND, grew up more than 5% compared to the previous year and setting the highest record ever. It shows that Vietnam's business environment is strongly attracting domestic and foreign investors. The total number of businesses increased by 38% in the 4 years from 2015 to 2019 (Figure 3.2). Among them,

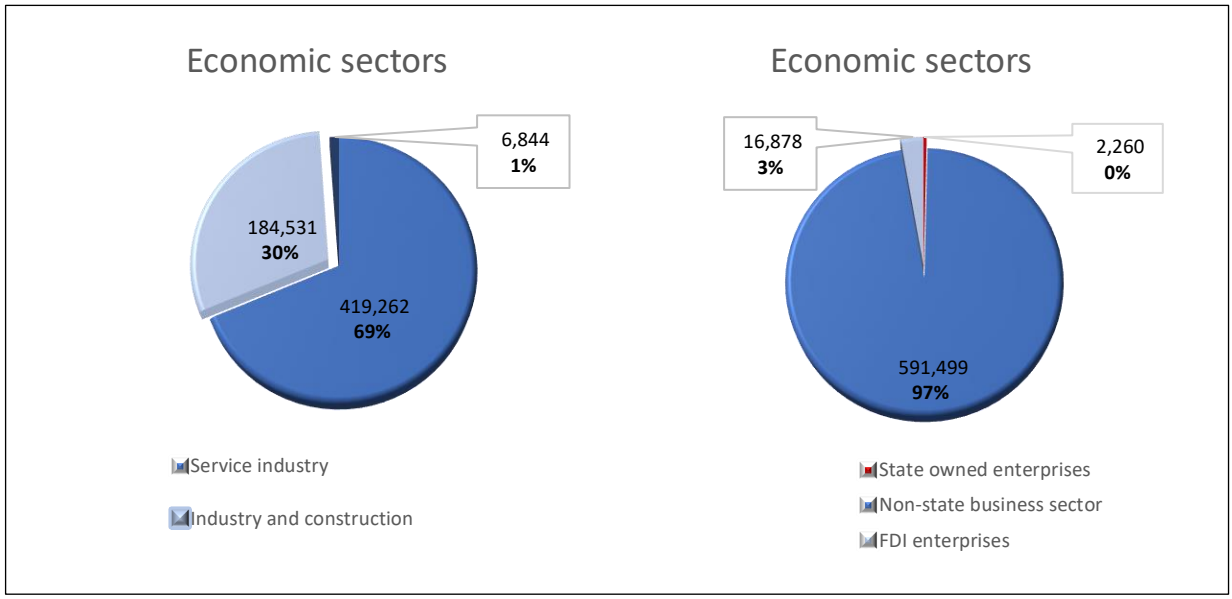
medium and large enterprises grew the most with 93% and 157%, respectively. This growth rate is much larger than the growth rate of small and micro enterprises with only 26% and 57% growth index. In this period, Vietnamese enterprises are on the way of developing both quantity and size of firms. If the number of large enterprises in Vietnam only accounted for nearly 1% and SMEs is 99% in 2015, then by 2019 the number of large enterprises will have nearly tripled, more than 17,000 enterprises, accounting for 3 % of total company quantity.

In 2015, it was counted only 5 enterprises per 1,000 people on average, this number increased to 7.9 by 2019. If only the population of working-age group, this figure is 15.4 enterprises. Although this index is smaller than other countries with more developed industries such as Thailand or Malaysia, the growth rate in Vietnam is still increasingly fast. There are 8/63 cities and provinces with business operating density per 1000 people higher than the national average including: Ho Chi Minh City has 26.5 enterprises, Da Nang has 19.8 enterprises, Hanoi has 19.3 enterprises, Binh Duong has 12.9 enterprises, Hai Phong has 9.8 enterprises, Khanh Hoa has 9.0 enterprises, Ba Ria - Vung Tau has 8.8 enterprises and Bac Ninh has 8.2 enterprises. These are concentrated areas of Vietnam's main industrial parks. The FDI capital into the Vietnam has been growing in recent year. Total registered capital of newly established enterprises in 2019 reached 1,730 billion VND, rise 17.1% compared to 2018. According to the Australian Government Trade and Investment Agency, Vietnam is standing 3rd in Southeast Asia in terms of the number of SMEs and in the top 20 start-up economies. By contrast, Vietnam is one of the 20 countries capable of implementing the lowest business plans, of which more than 3,000 Vietnamese SMEs are called successful. Medium and large enterprises are having more opportunities to participate in the global supply chain and the growth speed is faster because there are more potentials and advantages in the current situation. If receiving appropriate policies and effective solutions from the enterprises themselves, the domestic enterprises can compete with FDI enterprises in Vietnam and foreign enterprises in the region.

The statistics of General Statistics Office of Vietnam records that 69% of companies are operating in Agriculture, forestry and agriculture; 30% are operating in industry and construction and 1% are operating in service industry (Figure 3.3). Vietnam is a purely agricultural country, which clearly reflects the large number of enterprises operating in this

sector amounting to more than 400 thousand enterprises. However, in recent years, there has been a clear restructuring of enterprises in Vietnam market.

Figure 3.3: Enterprise type classification – Vietnam, 2019



Source: General Statistics Office of Vietnam, Whitepaper 2020

The proportion of the Agriculture sector has decreased rapidly, the proportion of Industry in GDP has increased rapidly, the proportion of Services has changed in a positive direction and there are positive signs of improvement compared to previous years. Up to now, contributing to the growth of Industry and Services accounts for about 90% of the growth of the whole economic sectors, higher than the period of 2006-2010. Contributing to the results of GDP growth in 2016-2018 is the growth of industry and construction reached 7.72%, services gained 7.26%; agriculture, forestry and fishery only reached 2.52%. According to the Ministry of Planning and Investment's expectation, the average GDP growth in 2019-2020 period is forecasted to reach 6.9%: agriculture, forestry and fishery will be 3.5%; industry and construction reached 7.89%; service reached 7.39%. This proves a progressive trend, consistent with the structural shift in the process of industrialization and modernization of the country, in order to contribute to improving the quality of growth and macro-economic development of the country.

In addition to restructuring the industry, there are also changes in economic sectors. While state-owned enterprises are plummeting, the number of FDI enterprises has increased rapidly thanks to the impact of attracting foreign investment. Until now, this area has become

a significant part of the economy, playing an important role in promoting the growth of many economic sectors, especially those in the manufacturing industries. It shifts the economic structure in a positive direction and contribute to effective settlement of many social problems and international economic integration. The FDI sector has grown steadily in almost all fields. The total number of FDI enterprises operating until December 31, 2013 was 9093, 6 times higher than in 2000, an average of approximately 16% per year during the period of 2000-2013. By 2019, Vietnam has nearly 17,000 active FDI enterprises. In the overall picture of FDI, it is worth noting that FDI disbursement has reached a record number, with a disbursement of 20.38 billion USD. According to the Foreign Investment Agency of Vietnam, in the context of the general downturn of global FDI inflows, the fact that Vietnam maintains its realized capital growth is encouraging results. Last year, the foreign investors have invested in 19 different sectors. The amount of capital for investment is big in the manufacturing industry with a total capital of 24.56 billion USD, accounting for 64.6% of the total registered investment capital. This is also a field that accounts for a large proportion of registered capital in terms of registration of new investment projects or expansion projects. The business for real estate is ranked second with total capital of 3.88 billion USD for investment, accounting for 10.2% of total registered investment capital. Next is the field of wholesale and retail, professional activities of science and technology ... there were 125 countries and territories investing in Vietnam in 2019. South Korea still leads with a total investment of 7.92 billion USD particularly, corresponding to 20.8% of total investment capital… This contributes to creating opportunities for domestic enterprises to study and absorb technology transferred, improve their competitiveness and production capacity in order to have opportunities to cooperate with many foreign producers as well as participate in global supply chains.

Regarding the efficiency of business operations, medium and large enterprises are currently the most positive indicators, especially non-state enterprises and FDI enterprises (Table 3.3). Industry and construction sector, although the number of enterprises only accounts for 30.2% of enterprises nationwide but attracts the most workers with nearly 9.4 million employees, accounting for 63.4% of the whole region's labor force. It is increasing by 0.5% over the same period in 2017. The industry had 52.0% of employees, up 3.0% over the same period in 2017. Of which, the non-state enterprise sector attracted 8.98 million

workers, accounting for 60, 6%, an increase of 1.9%. FDI enterprises attracted 4.71 million workers, accounting for 31.8%, increasing by 4.5%. In 2018, the MEs sector had the highest labor use efficiency with 17.5 times, followed by the large-scale enterprise sector with 16.6 times; small-scale businesses 13.6 times; the lowest is the micro-enterprise area 5.2 times.

In terms of debt ratio, MEs have the advantage when the debt ratio is at the lowest level compared to other businesses with only 0.2 (meaning that total debt accounts for only 20% of total assets). It is a very low index compared to micro or large companies when they are on average 70 to 80% of their debt. The debt ratio for firms depends on the type of business, the size of the business, the field of activity, the purpose of the loan. In order to evaluate this ratio is high or low, it must be compared with the industry average but if this figure is below 60%, it can be acceptable and relatively safe. Although considering debt ratios, companies also need to be assessed in parallel through payment ratios such as Current ratio (Current solvency = Current assets and short-term investments / Short-term debt) Cash ratio (Quick solvency = (Current assets & short-term investments - inventory) / Short-term debt) or Cash ratio (Cash ratio = Cash and cash equivalents / Short-term debt). A high ratio indicates a disadvantage to creditors but is beneficial for owners if the capital used is highly profitable. However, this index is too low also implies that enterprises have not taken advantage of capital mobilization channel by debt, which means they have not exploited well financial leverage. With the current low average debt ratio, MEs in Vietnam can fully borrow capital and develop businesses.

Table 3.3: Business performance of Vietnamese Enterprises 2018

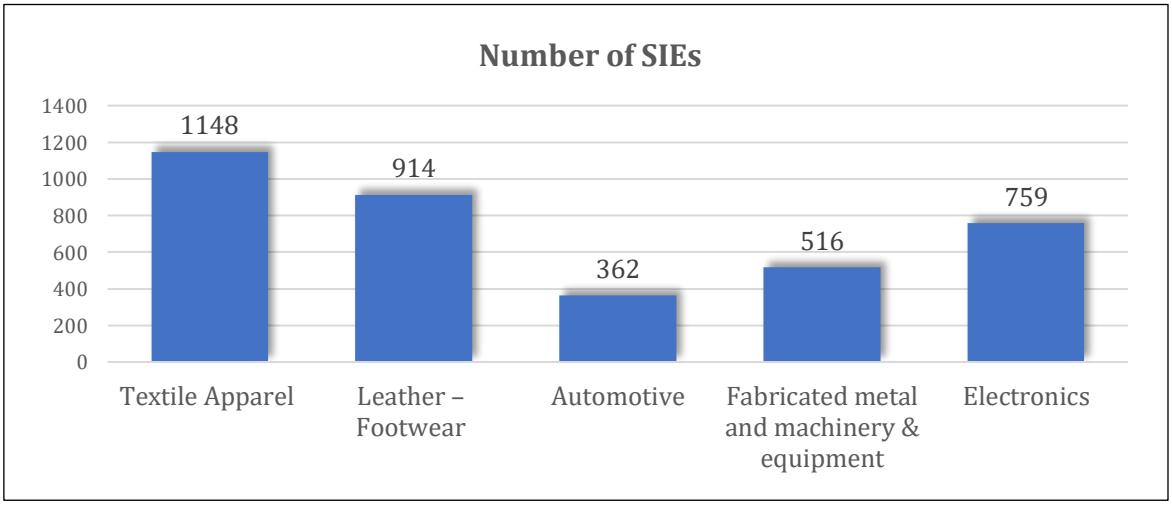
Classify	Vietnam enterprises	Employer performance (times)	Debt index (times)	Return on capital - ROC (times)	Return on Assets - ROA (%)	Return on equity - ROE (%)	Return on sales -ROS (%)
Type of business	State owned enterprises	20,0	0,4	0,4	2,0	8,9	5,6
	State owned enterprises 100%	21,3	0,3	0,5	2,2	7,3	5,0
	Non-state business sector	16,1	0,9	0,7	1,6	4,5	2,4
	FDI enterprises	12,6	0,7	1,0	5,8	15,4	5,6
Size of business	Micro	5,2	0,8	0,2	-1,1	-2,0	-6,4
	Small	13,6	0,5	0,8	-0,3	-0,8	-0,4
	Medium	17,5	0,2	0,9	1,1	3,4	1,2
	Large	16,6	0,7	0,7	3,6	13,1	5,4

Source: General Statistics Office of Vietnam, Whitepaper 2020

Looking at the returns to profit (ROC (Return on Capital), ROA (Return on Assets), ROE (Return on equity) and ROS (Return on sales)), it can be seen that FDI enterprises and large enterprises are using Capital efficiency and profitability at the highest level compared to other businesses. MEs are also performing well when the debt ratio is low, but the profitability ratios are quite high and positive. According to the General Statistics Office, in 2018, the industrial and construction sector had the highest return on assets with 3.9% while the lowest was in agriculture, forestry and fishery with 1.0 %.

Overall, Vietnamese enterprises are having many development opportunities with favorable economic conditions and positive macroeconomic situation. But what is the situation of Vietnamese enterprises in SIs? Which type of company is having the most opportunity in the current period to be able to thrive and participate in global supply chains? As the statistics of the Vietnam Association of Supporting Industries (VASI), there are currently about 3400 supporting enterprises nationwide, of which nearly 1600 are FDI enterprises - accounting for 48%, other foreign enterprises have nearly 1500 enterprises - accounting for 44% and the remaining 7% are state-owned enterprises.

Figure 3.4: Number of SIEs in Vietnam



Source: Web portal, supporting industry of Vietnam

Regarding the sectoral distribution of SIEs (Figure3.4), Vietnam's SIEs are the most active in Textile Apparel and Leather - Footwear industry with 2000 enterprises, accounting for 60% of the total number of supporting companies. This is a strong and long-standing industry in Vietnam, with a large number of manufacturers operating in the industry.

The trend of shifting and investing in the electronics industry in Vietnam has become the mainstream of investors in recent years. The development of Vietnam's electronics industry has attracted the attention of multinational corporations, especially those from Korea and Japan, in both the final product manufacturing and manufacturing sectors of electronic components. The world's leading large electronic corporation have mostly been present in Vietnam such as Samsung, LG, Canon, Intel, and Panasonic. Specifically from 2015, Vietnam is the 12th largest electronic exporter in the world and the 3rd largest in ASEAN. Electronics auxiliary businesses are being promoted to participate in the domestic supply chain. Currently, there are 759 auxiliary manufacturers providing to large electronic corporations in Vietnam, accounting for about 22% of the total number of auxiliary enterprises. This proves that electronic enterprises are making a strong change in the integration period. However, 95% of those exports belong to the FDI enterprises (Foreign Direct Investment enterprises). Domestic producers only join into assembling or processing activities and their competitiveness is still low; but with the current growth rate, these manufacturers have a lot of opportunities if they take the right steps.

The focus on industrialization has also increased the number of Fabricated metal and machinery & equipment and Automotive businesses in the past few years. Although the number of supporting enterprises in these two fields is currently limited, there are more than 500 supporting enterprises operating in Fabricated metal and machinery & equipment and nearly 400 supporting enterprises in Automotive, accounting for about 15 % and 11% of total supporting businesses. However, with the need to increase the localization rate and the development of electronics and automotive industries in Vietnam, the number of auxiliary companies of these two industries will increase rapidly and stronger than the supporting enterprises for the production of traditional industries such as textiles or footwear in the coming years. Vietnamese mechanics have strengths focusing on three sub-sectors: motorbike and motorbike spare parts, household appliances and tools, cars and auto parts. The statistics show that these three sub-sectors contribute for nearly 70% of the total industrial production value of mechanical engineering nationwide. The mechanical engineering industry only meets more than 32% of the domestic demand for mechanical products. Although the supporting enterprises participating in the supply chain for the mechanical and automotive industry will face many difficulties and barriers to entry into

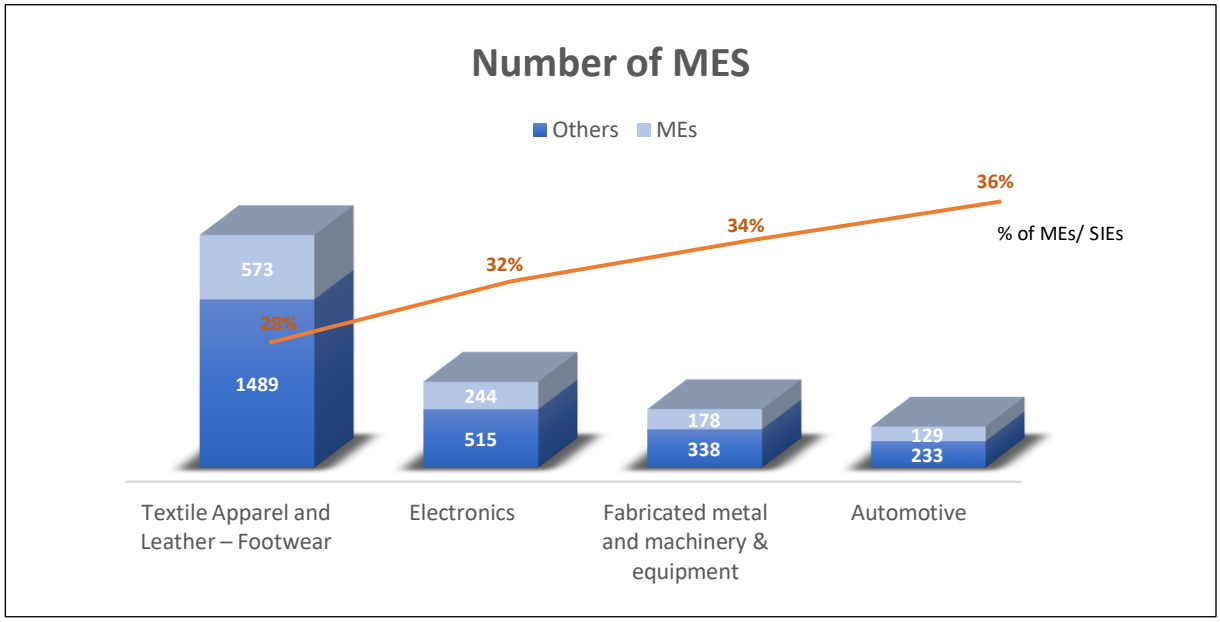
large markets such as: require a lot of capital, large initial investment, slow-moving capital, requires high-tech science, high- quality workforce. Products of the industry are not easy to distribute and consume like products of many other industries... but with high domestic demand as currently, Vietnam's SIs are having a lot of opportunities to be success.

3.2. Medium-sized enterprises in Vietnamese supporting industries

3.2.1. MEs overview

For the four main SIs of Vietnam, except Textile Apparel and Leather - Footwear industry, which is a traditional and developing industry, the rest are young and newly built from the state promotes the process of industrialization and modernization of the country. Because SIs is on the way to develop, manufacturing companies have many chances because the domestic competition is not tough although the factors to join the chain and the industry still face many obstacles. MEs are potential to develop more in the future supply chain.

Figure 3.5: Number of MEs in Vietnamese supporting industries



Source: Vietnam Supporting Industry Association web portal, 2019

Vietnam has about 3,415 SIEs operating in four key SIs, according to the Vietnam Supporting Industry Association in 2019, they recorded about 33% are MEs corresponding to 1144 businesses (Figure 3.5). More than half of MEs that participate in SIs, around 51%, are operating in the traditional SI: Textile Apparel and Leather - Footwear. Followed by MEs supporting businesses of Electronics industry, nearly 129 enterprises accounted for 36% of

the total number of SIEs in the industry. The fact is that supporting MEs of Electronics industry are growing at a very fast speed due to the investment of global corporations in Vietnam market such as Samsung, LG or Foxconn... Leading to thousands of manufacturers in the international supply chain come into Vietnam in order to produce and supply materials, spare parts and components. That is the reason why more than 3 thousand Vietnamese SIEs currently (a round 48%) are FDI enterprises. However, Vietnamese SIEs are also being promoted rapidly due to the increasing demand for materials in large quantities. The majority are non-state enterprises, accounting for 44%, because of flexible business strategies and quick response to demand and market. State-owned enterprises account for only about 7% of the total number of SIEs and operate primarily in the Textile Apparel and Leather - Footwear industry.

For the Fabricated metal and machinery & equipment supporting industry, there are about 178 firms among the 516 supporting MEs, equivalent to about 34% of the total enterprises supporting Fabricated metal and machinery & equipment. These MEs are mainly engaged in the supply chain with the processing of simple parts or components and do not belong to materials or components for mass productions. It is also due to the actual situation of the production capacity and scale of the business as well as limitations on capital investment for machinery or technology (the purchase of many machines for mass production if desired to participate. The production of input or raw materials is quite expensive, such as punching machines, CNC machines, milling machines, laser cutting machines, etc. Supplying materials for production process after they have experience in supplying and producing MRO (Maintenance - Repair - Operation) products. With current technology and capital, this business strategy can be said to be quite sure and safe for Vietnamese MEs, it is the reason why many Vietnamese enterprises start and follow this direction at the beginning.

The automobile industry is the youngest but is also one of the industries that require the highest technology and capital investment with big amount besides the electronics industry. It explains the fact that the percentage of MEs and large-sized companies in this supply chain is also the highest among the remaining SIs. Small businesses basically do not have enough capital, technology and capacity to participate in the chain because the barriers to the industry are relatively large. 36% of the supporting manufacturers in the industry are

MEs, corresponding to 129 firms out of 362 SIEs. But nearly half of these are FDI enterprises because of many important components and very high technology requirements that Vietnamese enterprises are not able to produce. Besides, the famous car manufacturing corporations such as GM, Ford, Honda, Hyundai, Mitsubishi, Toyota ... Vietnamese companies start participating into this industry, example VinFast – an automotive manufacturing company and a subsidiary of Vingroup Corporation. Although their business has just been established and manufactured vehicles since 2017 with a total investment of 3.5 billion USD and the factory has an area of 335 hectares in Hai Phong, Northern Vietnam, it can be said that it is first step and great opportunity for domestic suppliers. It will be much easier for these suppliers to participate in the supply chain for Vietnamese corporations compared to other international corporations. Vinfast has cooperated technology and engineering with major European car and component manufacturers such as BMW, Siemens AG and Robert Bosch GmbH of Germany, Magna Steyr of Austria, and Pininfarina of Design. The company also cooperates to produce body tires with Thailand's Aapico Hitech. It has led to a growing flow of technology to Vietnam. If supporting MEs can learn and convert quickly, they can develop successfully as Thailand suppliers.

3.2.2. MEs in Textile Apparel and Leather – Footwear industry (TALF)

The TALF industry is the industry with the biggest number of supporting MEs in Vietnam. With more than 500 MEs, accounting for 51% of the total MEs of SIs in all country. In particular, the enterprises producing Garment products are mostly medium and large manufacturers because their factories need to have enough capacity to participate in the process of processing and finishing products for customers. In recent years, footwear producers are also developing strongly due to the high competitiveness of output products made in Vietnam. 2/5 MEs in TALF are operating in the thick leather industry, corresponding to more than 200 enterprises, evenly distributed in all three main production activities: footwear, bags and ancillary products for main industry (Table 3.4).

It can be said that the number of SIEs has increased significantly in the last decade because of the high demand for raw materials and supplies from direct manufacturing enterprises such as: Nha Be Garment Corporation - JSC, Phong Phu International JSC, Viet Tien Textile Joint Stock Company, PouYuen Vietnam Co., Ltd (DFI company specializes in

OEM / ODM processing for major global brands such as Nike, Adidas, Asics, Clarks, Reebok, Puma, New Balance, Crocs, Merrell, Timberland, Converse and Salomon), Binh Tien - Biti's Consumer Goods Manufacturing Co., Ltd.

Table 3.4: Number of MEs in TALF

SIs	Sub-sectors	SIEs	MEs	Mes/SIEs
Leather – Footwear	**Total**	**914**	**222**	**24%**
	Footwear	342	67	20%
	Bag	253	76	30%
	Auxiliary materials	309	79	26%
Textile Apparel	**Total**	**1148**	**303**	**26%**
	Producing fiber	24	3	13%
	Producing yarn	66	18	27%
	Weaving	256	43	17%
	Dyeing and Finishing	42	6	14%
	Garment products	280	137	49%
	Other garment products	57	18	32%
	Producing materials and accessories	81	23	28%
	Textile products	2	0	0%
	Other fabric products	2	0	0%
	Others	338	55	16%

Source: Vietnam Supporting Industry Association web portal, 2019

If at the beginning of 2014, there were only 129 enterprises producing raw materials and accessories, in which: 35 tanning enterprises (including 21 private enterprises, 11 FDI enterprises, 2 SOEs, 1 joint stock company ; allocated in Ho Chi Minh City with 18 enterprises, Binh Duong has 8 enterprises, Dong Nai has 5 enterprises, the rest is allocated in Hanoi, Can Tho, Khanh Hoa, Thai Binh, Lang Son, Hai Phong and Vung Tau); 95 enterprises (70% of which are Vietnamese firms) produce raw materials, accessories materials, equipment, and 23 enterprises producing soles, 11 enterprises producing adhesives, 4 enterprises producing textile fabrics, 5 enterprises producing jigs and molds, 6 enterprises producing leatherette, 11 enterprises producing accessories and 4 enterprises manufacturing packaging items, 1 enterprise manufacturing machines and equipment. The remaining companies operate import and export business of raw materials, machinery and equipment for the footwear industry. The distribution of these businesses is quite concentrated in Ho Chi Minh: 47 enterprises, Binh Duong: 27 enterprises, Dong Nai has 17 producers and Hanoi has 5 enterprises ... In addition, SI enterprises of textile industry (such as fabric production, labels, zippers, buttons, elastic bands, chemical production and mechanical industry) also engages

in the production and supply of products and accessories for the footwear industry. By 2019, the footwear industry has more than 900 SI enterprise.

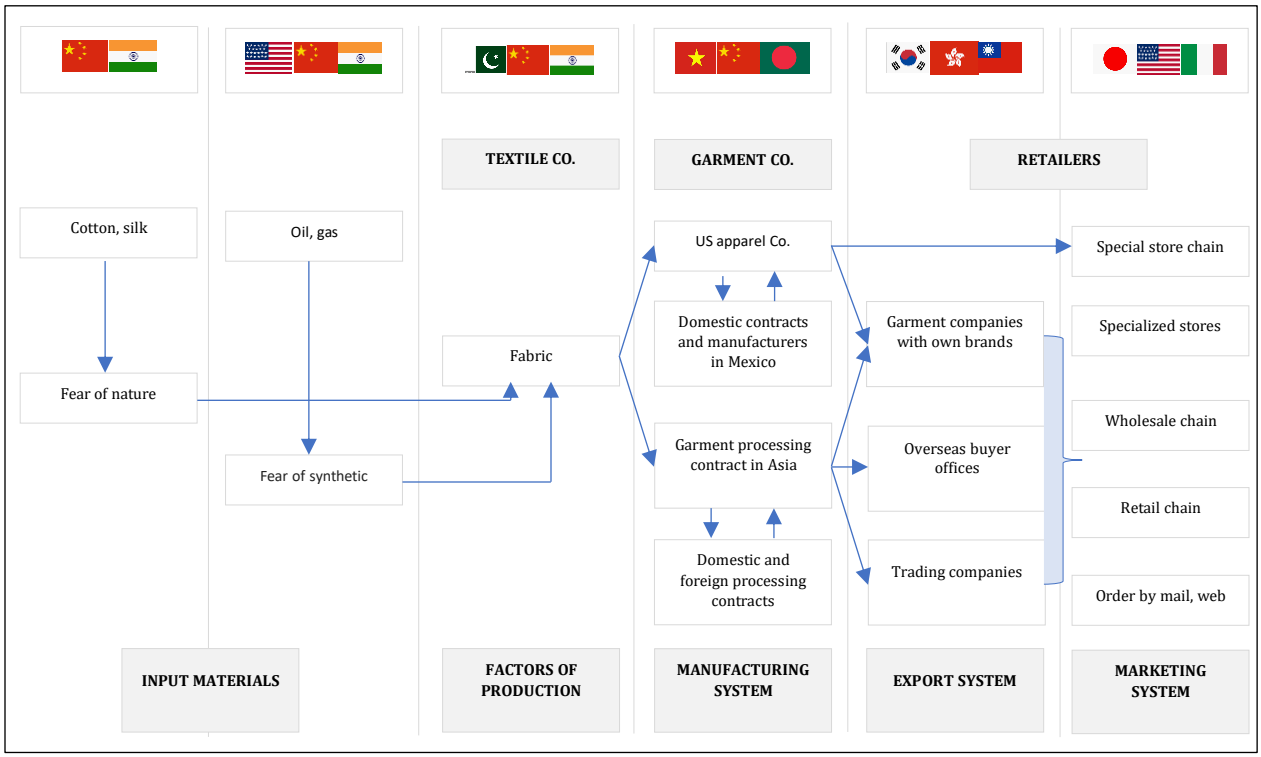
For the textile and apparel industry, there are more than 1,000 auxiliary enterprises, but of which only about 26% are MEs, over 300 companies. From the perspective of business results of enterprises in TALF, it can be said that the development speed is very fast and promising compared with the period from 2000 (since Vietnam normalized relations with the US and the sector restriction in international trade was abolished, FDI capital quickly came to Vietnam to invest in The textile and garment industry aims to exploit the available resources of cheap, abundant labour, low electricity prices and many tax incentives) to 2018 (when Vietnam becomes an exporting country). The third largest textile and garment industry in the world (after China and India), Vietnamese garments are exported to 100 countries over the world, including the US, Japan, EU and South Korea markets (with structural distribution 49%, 16%, 14% and 12% respectively). The revenue increased by 21 times from 2 billion USD to 42 billion USD. Exports also increased 20 times, averaging an annual growth of 15% to USD 36.5 billion in 2018 and creating jobs for 3.6 million workers. However, Vietnam's SIEs in general and MEs in particular have not been able to create high value added in the value chain of TALF industry (Figure 3.6).

Nearly half of businesses that supporting MEs are active in processing and CMT (Cut, Make, Trim). CMT production activities are contributing only 1% ~ 2% in the industry value chain. In addition, Vietnamese MEs must compete with other strong players in the supply chain from Bangladesh, China, Cambodia or Myanmar. In terms of long-term business strategy, Vietnamese MEs are coming to develop to participate in OEM - Original Equipment Manufacture activities, in order to supply input materials to the supply chain by the domestic market. The supply is smaller than the demand and relies too much on imported raw materials and foreign suppliers from China, Taiwan, Korea, India, Thailand, Malaysia, Indonesia, USA and Bangladesh. These MEs are mainly those producing leather, textile, yarn, Weaving, and the value-sharing ration from 4% to 10%.

The two production activities that create the highest value in the chain are ODM - Original Designing Manufacture and OBM - Original Branding Manufacture. Both producing processes are made by large enterprises. The big companies with ODM is come from Hongkong, Korea, Taiwan or Thailand. Leading OBM activities are corporations in EU such

as Italian, French, British, American and Germany. Some of OBM manufacturers are from Japan and South Korea. These two business activities are contributing from 25% to 40% of supply chain value.

Figure 3.6: Global supply chain of Garment



Source: Apppelbeaum & Gereffi (1994), Cammmett (2006), Industry Cannada (2008)

According to the General Statistics Office Vietnam about the products of the textile and garment auxiliary industry, nearly 63% of raw materials is purchased by direct manufacturing enterprises, more than 8% of raw materials is supplied to outsourcing companies, nearly 5% is supplied to mother companies overseas and nearly 25% are supplied to foreign distributors. For the output of supporting MEs Vietnam, except outsourcing, supporting products are being provided largely to domestic direct manufacturers and FDI manufacturers. Small export volumes are still mainly traditional products such as yarn, weaving and accessories. Promoting and improving the business to engage more deeply in the international supply chain of MEs requires a lot of change and improvement from the companies themselves. The support policies of the industry and the government are only a means to promote the development process more smoothly.

In the coming time, Vietnam's textile industry is facing a chance of economic restructuring or the US-China trade war. Vietnam, Myanmar and Cambodia are the Asian countries that have benefited most from the restructuring of the textile and apparel industry. According to estimates by Fitch Solutions, in the trade war between the United States and China, Vietnam's textile and apparel exports have increased by 30%, the global market share of apparel exports increased from 6.8% in 2018 up to 8.7% in 2019. Moreover, as soon as the Vietnam-EU Free Trade Agreement (EVFTA) took effect, 42.5% of textile products line and 37% the tariff lines on footwear will enjoy the import tax of 0% immediately. Vietnamese textiles and garments will have a competitive advantage over Chinese goods and compete on price with countries currently enjoying 0% tax rates such as Cambodia and Bangladesh. Overall, EVFTA will create a major competitive advantage in the short and medium term for Vietnam compared to ASEAN countries in the EU market. As a 2nd country in ASEAN with FTA with EU, Vietnamese manufacturers can take advantage of this to penetrate the market, build brands for Vietnamese goods in the global market.

3.2.3. MEs in Electronics industries

The movement of global capital flows can turn Vietnam into the second centre of world production of electronic products after China. China, Singapore, and Korea are the top 3 electronics exporters, accounting for 45% of total electronics export value worldwide. However, in 2012, after a series of large electronics corporations investing in manufacturing in Vietnam, Vietnam reached 5% of the total market share for completed electronics products, only behind China if only considering the export segment of smartphone products. Compared with other ASEAN countries, Vietnam's electronics industries are contributing the highest proportion to GDP, averaging about 25% of GDP in recent years, while the electronics industry's contribution to GPD of other countries in the region are under 15%: Indonesia, Malaysia and Singapore are under 10%, Philippines and Thailand are from 10% to 15% of GDP. Electronics industry becomes an importance industry in Vietnam with a fast-growing sector and creates a much higher value than traditional Vietnamese industries such as textiles, leather shoes or agricultural product manufacture. The leading electronics companies in the supply chain in Vietnam can be mentioned: Intel, Microsoft, LG, Panasonic, Samsung, Hitachi, Active-Semi, Hanel, Fuji or Xerox with main products are ICs,

semiconductors printed circuit boards, computers and smartphones. The electronic manufacturers and SI companies are concentrated mainly in the North of Vietnam, in large industrial zones at Bac Ninh, Thai Nguyen and Hai Phong provinces.

Table 3.5: Number of MEs in Electronics industries

SIs	Sub-sectors	SIEs	MEs	Mes/SIEs
Electronics	Assembly	69	17	25%
	Design	10	2	20%
	Metal components	28	7	25%
	Electrical components	143	53	37%
	Active components	34	6	18%
	Passive components	17	6	35%
	Mechanical components	76	20	26%
	Plastic and rubber components	18	3	17%
	Other components	276	88	32%
	Total	**671**	**202**	**30%**

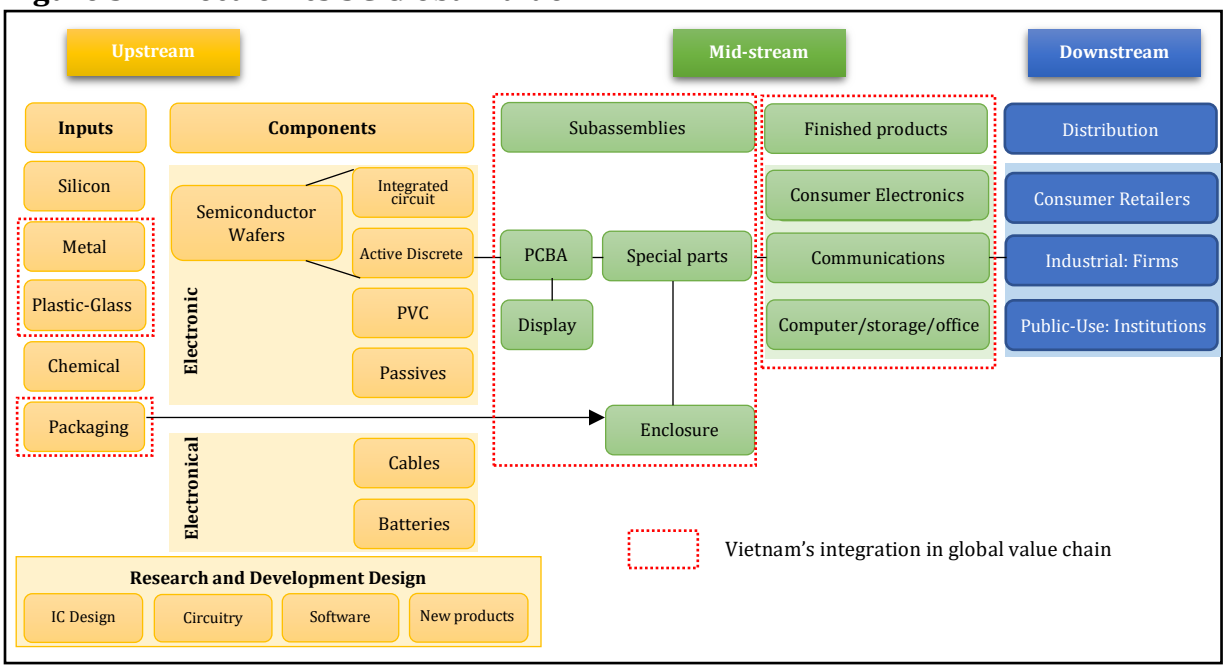
Source: Vietnam Supporting Industry Association web portal, 2019

Among over 1,000 electronic enterprises, Vietnam currently has 671 SIEs, of which MEs account for 30%, equivalent to 202 companies. Most of these businesses are providing electrical components, mechanical components, assemblies and other materials. However, among these 200 MEs, most are FDI firms, the percentage of Vietnamese enterprises accounts for only 10 % total number of MEs. Almost these FDI enterprises are from South Korea, which are suppliers and vendor systems of Samsung Group, investing in production and companies in Vietnam to supply raw materials for two power factories: Samsung Electronics Company in Bac Ninh and Thai Nguyen province. This is the driving force for creating clusters for SIs, as in Bac Ninh Province, there are more than 137 companies specializing in supplying raw materials for Samsung, excluding SMEs belonging to vendor tier 2, 3 or 4 for large corporations. Therefore, in the period from 2006 to 2018, 69% of FDI inflow came from Korean, the rest allocated 12% from Japan, 7% from Hong Kong, 7% from Taiwan and other countries only contributed for 5% of total FDI.

With technology limitations, these producers involved in providing low-value-added materials or services such as packaging or printing items. Statistics from the Ministry of Trade and Industry of Vietnam also show that domestic vendors can actually meet only 30%~35% of the demand for appliance manufacturing and 5% for high-tech electronics production (MIC, 2016). These calculations are still in theory, most of the input materials for

electronics manufacturing in Vietnam are imported in fact. This is clearly shown in the volume of imported raw materials as Chapter 2 mentioned. The electronics industry is leading the list of the largest import volume in Vietnam. In 2019, the total import was over 50 billion USD.

Figure 3.7: Electronics 3C Global value



Source: Frederick, 2017, 3C refers to consumer electronics, computers and communication devices.

Figure 3.7 shows the membranes that MEs of SIs operate in Vietnam. In the electronics value chain, these enterprises are producing and providing goods and services in the Upstream and Mid-stream areas. MEs are providing metal materials, plastic components and packaging items. Some companies act as an outsourcing business or subassemblies for large businesses. Upstream activities in Vietnam are very weak. Designing is carried out abroad, the main components (electronic chip, PCB, etc.) are imported from other countries. Only a few MNCs have limited internal R&D activities.

Almost Vietnamese MEs have not yet met the criteria to become tier 1vendor, direct suppliers for electronics corporations. Most of them are tier 2 or 3 vendors currently. The reason is not only because of the strict quality requirements of the corporations, but also because of many other requirements for companies that want to become tier 1 supplier. In addition to the requirements for production provided by the suppliers, the first-class vendors must also meet the requirements of the factory, labour safety, quality management

process, production process, storage conditions, regime for employees... It is not natural that leading electronics manufacturers such as Samsung, Intel or LG manage and control many factors besides supporting products they buy from direct vendors. All these factors have an indirect impact on the product quality that auxiliary enterprises provide, as well as the risks of material supplying. Assuming that a material supplier does not give to their workers a fair or timely payment, it could lead to a production strike that affects the vendor's material supply. It will have serious consequences for electronics manufacturers, because without only one material, the entire production line is at risk of being stopped and affecting the whole factory. That is a reason why it is extremely difficult to become a direct supplier. All suppliers have to go through the rigorous evaluation process when registering to become a material vendor and under control by large corporations sometimes.

Vietnamese MEs in the electronic support industry have almost no participation in the supply chain of large electronics corporations, the fact that they cannot. Taking an example of direct suppliers for Samsung Electronics Vietnam, excluding MRO vendors, in over 500 first tier suppliers, Vietnamese companies are counted about 6% and most of them are FDI enterprises. By the end of 2018, only 29 Vietnamese enterprises were Samsung's vendors tier 1, equivalent to more than 10% of the total number of domestic supporting vendors. Although it is difficult to become a tier 1 vendor, Vietnamese MEs can start joining the supply chain like tier 2 or tier 3 suppliers if they are hard to find innovative solutions and improvements to meet international requirements and standards. In the current 29 direct vendors, many manufacturers also started by becoming a tier 2 supplier of Samsung. After a period of development and familiarization with the production process according to high standards, these enterprises have invested and innovated to be able to become a first-class supplier and compete with FDI enterprises as well as other foreign suppliers. It is a process that requires time and investment, most of which takes several years. However, once they join into the supply chain of top corporations, the opportunity for development is great. After adapting the strict requirements, SIEs can expand their business to not only the domestic market but also to the international market.

3.2.4. MEs in Fabricated metal and machinery & equipment industry

The total demand for machinery and equipment of Vietnam in the next 10 years from now to 2030, is forecast up to 350 billion USD. Domestic demand is a large market for

producers to develop, not counting the ability to export material or component and participate in the international supply chain of SIs. The Vietnam Association of Mechanical Enterprises (VAMI) announced that if SIs is invested, the SIs could fully meet 70% of the total domestic demand by 2030. However, this is a very unlikely scenario in the next decade with the current situation. The timidity of investment due to large investment capital and long capital turnover, along with confrontation with FDI enterprises has made Vietnamese SIEs hesitate to invest more for further development. Therefore, MEs have not expanded to become large SIEs and become the locomotives for small domestic enterprises to follow the same development.

Table 3.6: Number of MEs in Fabricated metal and machinery & equipment industry

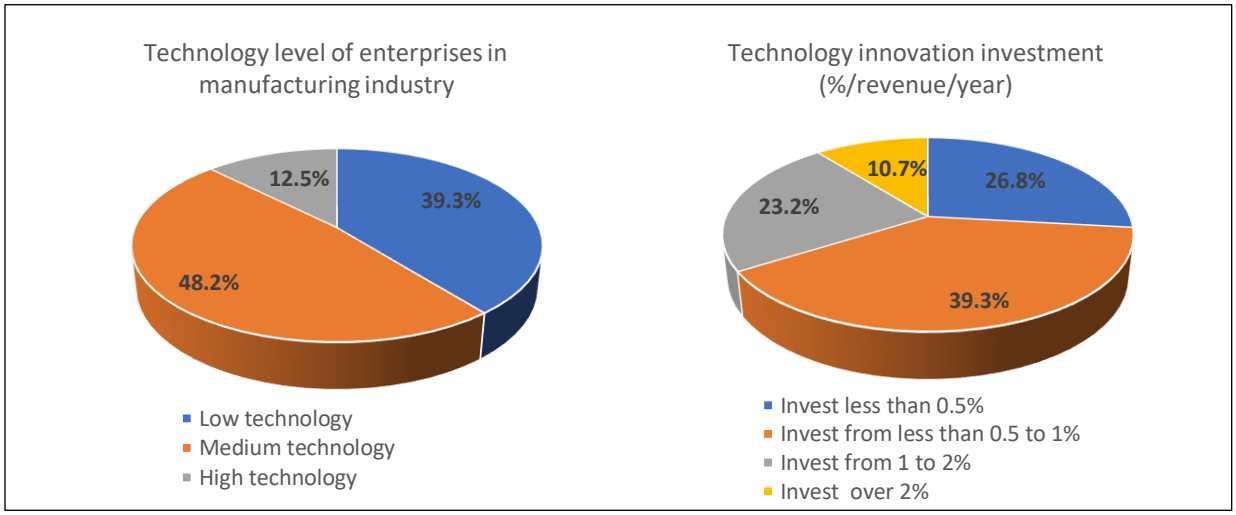
SIs	Sub-sectors	SIEs	MEs	Mes/SIEs
Fabricated metal and machinery & equipment industry	Stamping	116	43	37%
	Mold making	157	54	34%
	Mechanical	314	98	31%
	Metal plates	111	50	45%
	Welding processing	109	43	39%
	Foundry	61	24	39%
	Forging	31	11	35%
	Surface treatment	153	69	45%
	Heat treatment	45	15	33%
	Production of factory equipment	79	25	32%
	Production of materials	36	15	42%
	Total	**1212**	**447**	**37%**

Source: Vietnam Supporting Industry Association web portal, 2019

Vietnam currently has about 1,212 mechanical manufacturing establishments belonging to SIs, in which the SIEs account for about 37%, equivalent to nearly 450 enterprises (Table 3.6). More than 60% of the remaining businesses are small companies, which are simply outsourcing or repairing, some of the large enterprises of the industry are FDI enterprises. The total capital of the state-owned mechanical engineering industry is estimated at 370 million USD, the total registered capital of foreign investment is about 2.1 billion USD. MEs in particular and supporting enterprises in general focus on some main sub-sectors: Mechanical, Surface treatment, Molding and producing Metal plates. The technological level in the mechanical engineering industry is considered backward, the level of automation is only low (about 7%). Therefore, the production activities of Vietnamese enterprises mostly focus on supporting branches that do not require too high technology and

quality. Products that require high quality and standards are mostly imported from foreign countries such as Japan or Korea.

Figure 3.8: Technology level and Innovation Investment



Source: Nguyen Trong Hieu & Pham Trong Hieu, Technological innovation in the mechanical engineering industry in Vietnam, JSTPM Ep.4, No. 3, 2015

According to a survey of the Vietnam Institute of Inventions and Technology Exploitation of SIEs in the mechanical engineering industry: about 39.3% of manufacturers are using low technology, 48.2% of enterprises use average technology and only 12.5% of enterprises apply high technology into production (Figure3.8). As a result, the rate of high technology use in Vietnam's mechanical industry is much lower than many other countries in the region participating in international supply chains such as Singapore with 73%, Malaysia 51% and Thailand 31%. In order to reach the industrialization level, this criterion must reach over 60%. Moreover, SI's production capacity is related to technology, not only taking into account the technological level of the machinery but also taking into account the technological level in many other aspects such as operating capacity, adapt to high technology, ability to absorb and create new technology. These factors require both human and capital investment for a long term. Therefore, many MEs in Vietnam are still hesitant to invest in technology.

Technological innovation in the industry is mostly imported from other countries through forms such as buying machines, production processes ... Self-research to create new technologies or useful solutions for technological innovation are negligible normally. Central

Institute for Economic Management (CIEM) estimates that only 11.9% of enterprises carry out research and development (R&D) activities, and 16.4% of companies renovate existing machinery and equipment, the remaining 71.7% of enterprises do not participate in any activities related to technology innovation. Most large enterprises only have the R&D department and innovation separately, while SMEs are financially constrained, so it is difficult to invest in R&D for new technologies. Even investment in technological innovation for the state's mechanical engineering industry is much lower than other countries in the region such as Korea or Thailand. Although SMEs are assessed as important about technology innovation to business efficiency, 98% of enterprises think that this is a necessary activity, but only 50 % continue to invest and reinvest in R&D activities, technology innovation, 55% of businesses have the need to upgrade technology to improve product quality, 23% to diversify products, 25% to improve production capacity and very few enterprises think that technology upgrade is required by law (according to statistics of Vietnam Central Institute for Economic Management). Although manufacturing companies are interested in and carry out technological innovation activities, the ratio of investment to average revenue in the past 3 years for technology innovation activities is still low, particularly in 56 surveyed mechanical engineering enterprises, only 10.7% enterprises investing over 2%, 23.2% of them investing from 1% to 2%, 39.3% of enterprises investing from 0.5 to 1% and up to 26.8% of the groups invested less than 0.5% /revenue/year.

3.2.5. MEs in Automotive industry

From data of the Ministry of Industry and Trade, up to now, there are 516 manufacturing enterprises involved in the automobile SI, including 44 assembly enterprises, 39 manufacturing chassis, body and vehicle body, the rest are enterprises producing spare parts. The figure is so low compared to 2,500 enterprises in Thailand: Thailand has nearly 700 tier 1 suppliers, but Vietnam has less than 100 and they have about 1,700 tier 2 and 3 suppliers while Vietnam has less than 150. Among them, 39% are MEs corresponding to about 200 enterprises (Table 3.7) spread evenly in most sub-sectors related to manufacturing support activities in the industry. However, enterprises that support the automotive industry in Vietnam can only produce simple components such as chassis, body, cabin, car door, tires, radiator, brake wire, conductor. electricity, transmission axles… and small investment, , leading to limited international competitiveness.

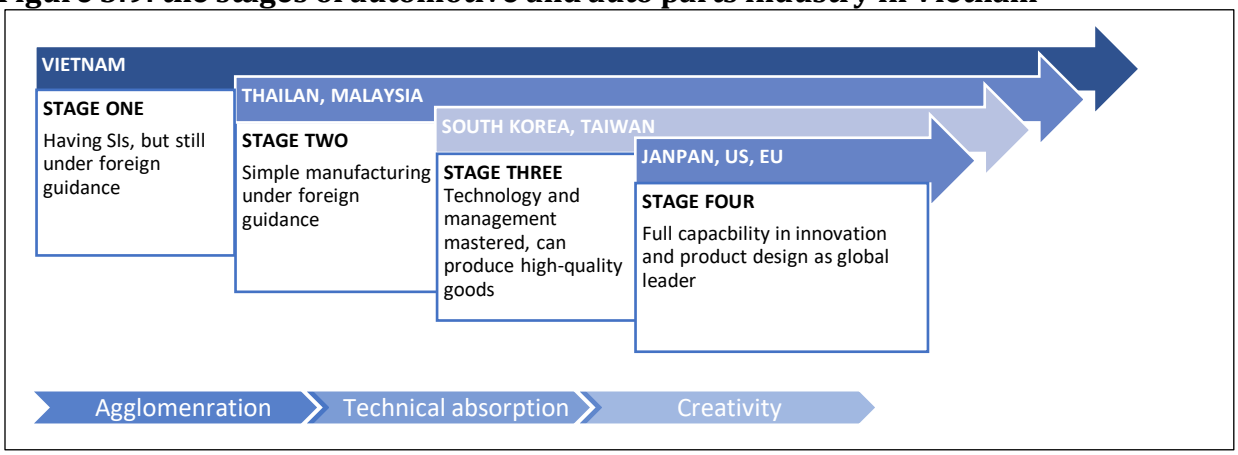
Table 3.7: Number of MEs in Automotive

SIs	Sub-sectors	SIEs	MEs	Mes/SIEs
Automotive	Assembly	44	11	25%
	Chassis and body	39	21	54%
	Engine components	64	27	42%
	Transmission parts	70	33	47%
	Exterior components	50	22	44%
	Interior components	64	29	45%
	Electrical and electronic components	60	21	35%
	Other components	125	38	30%
	Total	**516**	**202**	**39%**

Source: Vietnam Supporting Industry Association web portal, 2019

Figure 3.7 shows the levels of supply chain participation in automotive industry. In four levels, Vietnamese supporting enterprises MEs are just starting in the first stage that produces a few auxiliary materials but under the guidance and supervision of customers, most of them here are foreign manufacturing groups (Figure 3.9). A few large corporations are developing and converting to the stage two that is already having the technical absorption. Although it is still only able to manufacture simple supporting products, there are changes in technology levels that makes the product quality and capacity change significantly.

Figure 3.9: the stages of automotive and auto parts industry in Vietnam



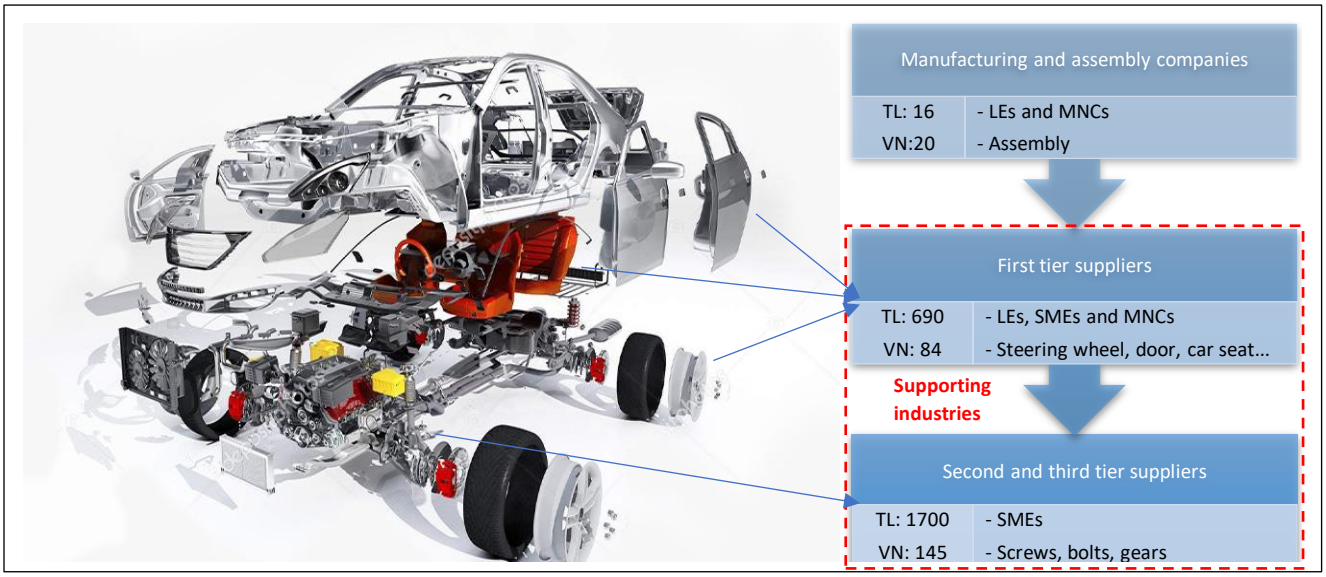
Source: Kenichi Ohno (VDF & GRIPS), 2004

Most of Vietnam's MEs are still unable to convert due to lack of investment in technology innovations, their products are mainly around automobile tires and MRO products. I the future, if MEs can solve the problem of capital and technology, then transition to other stages is possible. Through successful examples of MEs in Thai or Malaysian

automotive supporting industries. By linking MEs businesses and building clusters for the industry, the growth rate of SI increased rapidly. Currently, SIEs in these countries are developed than Vietnam but they cannot compare with big SIEs from Korea, Taiwan, Japan, the US or EU.

Figure 3.10 shows the disparity and difference between supporting enterprises of Vietnam and Thailand in both quantity and product. It is clear that the gap between the two countries' SIs is quite large. While the number of Thai SIEs is in the thousands, the number of Vietnamese automotive supporting enterprises is only around 10% of this number and most of them are SMEs. Thailand has about 700 tier 1 suppliers and 1,700 tier 2 and 3 suppliers, Vietnam owns only 84 and 145 vendors, respectively. The products that Thailand is providing in the supply chain also have higher technology and high value added such as steering wheel, door, car seat while most Vietnamese MEs are only able to manufacture low-end products such as screws, bolts or gears.

Figure 3.10: MEs in Automotive supporting industries



Source: BOI (TL data), IPSI (VN data)

Regarding to the macro factors, besides the solutions that MEs enterprises can implement to participate in the supply chain, the external impacts also significantly affect this goal. In order to develop SIs, it is necessary to have motivation from the main industries. In other words, if car manufacturers cannot develop in Vietnam, there will be difficult opportunities for SIEs to development. In recent years, car manufacturers both domestic and

international in Vietnam have faced a major obstacle from the asynchronous development of infrastructure in Vietnam. The market is really big with potential consumers, a large population, car ownership per capita is low compared to developed countries, customers can afford to buy. However, the low infrastructure limits the purchase and use cars in Vietnam. Users face to many difficulties such as no parking space and traffic difficulties due to small and poor-quality roads. Therefore, in order to develop SIs, it needs a great effort by the enterprises themselves and also needs the development of the main industry and the accompanying infrastructure of the Government in the future.

3.3. Strength point of Vietnamese MEs in SIs

3.3.1. Internal factors

3.3.1.1. Labour force

The majority of Vietnamese supporting MEs are having quite good strengths in labour force as well as management. Although not comparable with large enterprises, but with appropriate solutions and innovations, they can fully participate in the global supply chain.

Currently, Vietnamese companies have advantages over foreign suppliers with abundant labour force and low cost (the average wages of workers in the manufacturing industry in Vietnam is only about 240 USD per month, much lower than other countries in the region). Although labour costs will soon cease to be Vietnam's strength in near future). Besides, lower production and management cost leads to increased competitiveness if technology and product quality are not considered. Vietnamese human resources (HR) are quite young and the number of workers in the manufacturing industry from 18 to 25 years old makes up the majority, is disciplined and easy to train or educate.

In recent years, promoting the SIs are paid high attention of the Government, Vietnamese producers have a serious shortage of technical and highly qualified human resources. However, by focusing more on training and developing HR, many employees in SMEs have met the job requirements in using foreign high-tech machinery, inventing and improving old machines to increase capacity and improve product quality. HR for management have also been significantly improved. It can be seen that MEs, especially 100% pure private enterprises, have a relatively flexible pace of change according to market

fluctuations, MEs also gradually integrate into and quickly adapt to the management and production processes of FDI companies.

According to the World Bank research, Vietnam's labour productivity is quite high compared to other ASEAN countries, even higher than India and other BRIC emerging economies such as Russia, Brazil or China. MEs reportedly generate about 10,500 USD value added per worker. Estimates of the labour productivity distribution show maximum concentrations at 8,000 USD and only a few large firms generate more than 60,000USD of value added per worker. In Vietnam, there is no big difference in labour productivity between SMES and large.

Overall, the work force of Vietnam is plentiful, young and easy to train, disciplined and highly productive while labour costs are low. Workers at MEs are not too inferior to large firms, but in terms of high-quality human resources in MEs, it is a limitation. This issue will be analyzed more detail in next part of this research.

3.3.1.2. Ability to cooperate and compete with large enterprises and MNCs

While the demand for localization rate is increasing and urgent, the supporting MEs in Vietnam are gaining more motivation for development. Most of these manufacturers are currently competing mainly with FDI enterprises of the same size or big companies. Instead of confronting, MEs can choose their own ways to cooperate with these businesses to develop together. It is the direction that many MEs in Vietnam are taking in their plans to join the supply chain of SIs. While FDI enterprises and large enterprises are tier 1 suppliers of multinational industrial groups, MEs can fully cooperate to become tier 2 suppliers in the domestic supporting industry chain. After creating strong and well-resourced clusters, these firms will have the opportunity to participate more deeply in global supply chains such as growing to become tier 1 vendors or exporting ancillary products to other countries. It is also the development process of many countries in the region such as Thailand or Malaysia, countries that have succeeded in developing SIs.

Domestic suppliers get more advantageous if they develop production and supply low-end parts at low cost because they take advantage of local resources, while large and FDI

enterprises is mostly invested in high-end products because of high value added, corresponding to large investment in technology and capital.

3.3.1.3. Ability to learn technology and innovate

Most of the MEs of Vietnam have less conduct R&D than large firms due to lack of financial resources. But they compensate for that limitation in another way. It is improving through creating or re-engineering products to improve product quality or meet the requirements of the market. It can be said that Vietnamese SMEs are quite creative and are diligent in finding solutions to self-improve existing technologies or machines. The job creation rates in SMEs in Vietnam are currently between 5% and 10%. This is quite a high rate because most of it is the index for large corporations in many countries.

In general, Vietnamese manufacturers have ability to learn and absorb new technologies very well because technicians usually have a lot of experiences. In the past decade, the training of engineers or interested in research activities, supply improvement has been more important than in the past. The structure of investment for research and development between the public and non-state sectors has changed and increased strongly from the non-state sector. Previously, this ratio structure in the non-state sector and the state was 30-70, now the non-state sector accounts for more than 50%.

3.4. Problems of MEs to participate global supply chain

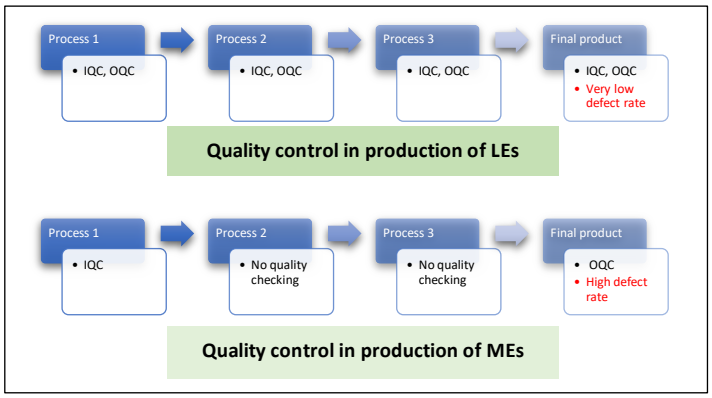
3.4.1. *Internal factors*

3.4.1.1. Problems of products (QCD - quality, cost, delivery)

QCD - quality, cost, delivery are three basic problems related to products that Vietnamese suppliers are facing when participating in the hardware supply chain for multinational manufacturing corporations with many standards and strict requirements. This is a common problem not only for MEs but also for small and large enterprises in Vietnam. The first restriction is related to product quality, with limited technical level and investment in machinery, the supplier's products often fail to meet quality standards of customers. Unlike large companies with well-defined manufacturing processes, Vietnamese MEs are still operating and organized quite poorly and do not have clear regulations and standards for each company.

This part of production leads to a lack of strict control over the product quality: NG products or high defect rate. Example, in the production lines of large companies, there is an organization of input quality control (IQC) and output quality control (OQC) for raw materials in every process of production. This activity reduces the ratio of NG for final products, mostly below 0.1%. For Vietnamese MEs, most of them only have IQC and OQC staff at the beginning and end of the production, so the proportion of NG goods transferred to customers is higher. Not many products of Vietnamese supporting companies have full international certifications that are offered by International Organization for Standardization (ISO) or Automotive Industry Action Group (AIAG). Limitations on product quality standards have become an obstacle for Vietnamese suppliers to enter the supply chain, not to mention other obstacles related to factory quality, manufacturing processes, and conditions for workers and so on.

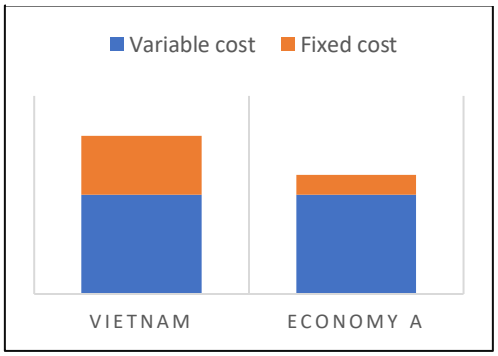
Figure 3.11: Quality control in production process



Source: Author

Price is the second barrier related to products to compete in the supply chain. Figure 3.12 shows the current price structure of raw materials or spare part of Vietnamese enterprises in comparison to the price of imported raw materials. MEs in Vietnam are at the first stage in the development process to join the international supply chain, so the initial investment cost for machinery is quite large. It is fully depreciated, not to mention the low demand and the production with small quantity which have resulted in the fixed cost per product being higher than many imported materials.

Figure 3.12: Local cost of production of parts and components (per unit)



Source: Case Study on Supporting Industry Promotion Policies in APEC – Vietnam

In addition, the delivery of supporting MEs is not flexible while multinational manufacturing firms have quite strict delivery requirements while demand fluctuates frequently. In order to minimize storage and management costs, most of the raw materials and components purchased domestically are required to be delivered with DO - Daily delivery form and there is no safety stock. Customers usually ask for urgent shipments because of changing demand or materials have high defect rate and need for to compensate for NG materials. Meanwhile imported materials are kept stock normally and shipping by PO - Purchase order (can be delivered daily, weekly or monthly) and have safety stock depending on L/T (Lead time) of delivery. Therefore, MEs suppliers have many difficulties when their customers order early delivery for urgent cargo, increasing or decreasing the number of deliveries. It is difficult to handle the problem for prepare goods in short time or keeping stock with big quantity. A lot of MEs don't have enough capacity to manufacture a huge volume and delivered immediately according to customer's requirements. On-time and unsolicited deliveries directly affect supplier reviews of large corporations as lack of raw materials leading to stop production lines and it is paramount for MNC manufacturers due to the serious consequences it brought. Many mid-sized suppliers that are unable to accommodate or respond poorly to delivery may be completely excluded from their current supply chain even though their products have good quality and competitive price.

3.4.1.2. Finance problem

Many MEs cannot join into the supply chain due to lack of capital and weak finance for investment. The lack of capital has led to the problem of Minimum Efficient Scale, as Vietnamese suppliers and manufacturers of MEs have a small volume and cannot expand production, so MNCs can hardly consider buying and selling raw materials for these businesses. In order to provide raw materials for large corporations, investing in research, machinery, factories, people ... is an essential requirement and most of them need a long payback period or long capital turnover due to the process to become a supplier for these corporations can take from 3 to 6 months, even 1 year because of many rounds of evaluation, appraisal and improvement.

With the target is pushing the domestic SIs and increase the localization rate of major industries, Vietnam government has a lot of policies to support SMEs to develop and

participate in global supply chain. But most of these policies are still on paper and have not really brought about practical effects that many SIEs want to develop but cannot. The above content is stated in Resolution 115 on solutions to promote the development of SIs that was signed and issued by the Prime Minister. Accordingly, SIEs with priority development will be given short-term preferential loans from credit institutions. For medium and long-term loans, the State will compensate the interest difference up to 5% per year. In fact, very few domestic SMEs can access this source of capital and credit. This leads to many businesses losing their growth opportunities when they do not have enough investment capital. A typical case is that of Hanel PT Electronics Company, a manufacturer in the electronics and high technology industry. "Recently, we had 2 new customers giving extremely big orders. This is an opportunity for us to make a breakthrough. But to meet these orders, we will have to increase production up to 500%, even 1000% of the current capacity. That is a very big challenge" said Ms. Tran Thi Thu Trang, General Director of Hanel PT Electronics Company (Bac Ninh). However, according to the female General Director above, in the past 20 years, the company has never been able to borrow any preferential capital from the Government. The company wants to expand production, increase scale to capture growth opportunities, but the current policy specified in Decree 111/2015 of the Government only gives incentives to new investment projects and manufacturers must have collateral.

With Value Added Tax (VAT) policies, according to the Ministry of Finance, researches and submits to competent authorities to amend the VAT Law, in the direction of adjusting the VAT refund mechanism and time, to facilitate capital gains for enterprises. While concessional loans were almost unfeasible, the current indirect policies of financial support such as VAT refund policies for SMEs also make SIEs recognize "yes but not like". Recently, 4P Electronics Company (Hung Yen) - a prominent brand in the electronics SI in Vietnam, is a tier 1 supplier to LG and a tier 2 supplier to Samsung production line for a foreign corporation because it could not stand the financial pressure.

To ensure product quality, the company has invested hundreds of billion VND in assets, machines and technology. The refundable VAT is estimated to be 50 billion VND. With current regulations, the company will be refunded VAT. However, the State will only deduct this tax gradually over the time the machinery assets are depreciated. In other words, the

State is occupying a huge amount of capital of enterprises for a long time, while producers need this source of capital immediately to operate their production and business.

3.4.1.3. Lacking high quality work force

Although the plentiful and cheap labour force in Vietnam is a strong point to attract FDI, high quality HR are a difficult problem for domestic MEs. Almost the unskilled workforce is very young and have not yet received professional training so they need to require recruiters training after recruitment. For SMEs, these training procedures are quite weak and of low quality, leading to low quality of labor and not maximizing labor efficiency. Due to financial constraints, these enterprises face to many difficulties in attracting highly qualified staffs and experts while large enterprises are willing to pay an attractive salary for this small group of work force. The number of high-quality workers for SIs is small because the government has only focused on developing this group of workers in the past few years, SMEs cannot recruit usable

3.4.1.4. Information failures

Without official information channels to collect information about FDI sourcing strategies, potential domestic suppliers without business connections will suffer a disadvantage in terms of linkage opportunities. Furthermore, domestic firms may have little direct interaction with global buyers, especially if leading firms (especially OEMs) coordinate from headquarters outside of Vietnam. Domestic firms may sell indirectly to global buyers (or firms) through intermediaries (eg the garment industry) and this hinders direct collection of information about demand. of global buyers and acquired experience and skills such as sales and marketing. This is further complicated by the fact that there may be a "relational" governance structure in the GVC that relies on informal networks that are formed over time. This makes it more difficult for unaffiliated domestic firms to enter the global supply chain without joining a designated supplier or matching or being referred. The experience of a number of successful domestic suppliers shows the importance of using informal networks to gain information on how to participate in the supply chain. Informal referrals help to "bypass" the limitation of lack of market-based official information on FDI sourcing strategies. Interviews with successful local suppliers also indicate that until now,

they are not aware of the official channels of information about attracting MNC's procurement opportunities and thus rely on informal personal relationships.

Furthermore, the lack of information about supplier standards weakens the opportunities for association because senior and their suppliers must adhere to the companies' quality management processes. Interviews with tier 1 suppliers in the manufacturing industry revealed a large perception gap in quality, cost and delivery (QCD) requirements between domestic firms and other MNC though achieving QCD is a common selection criterion for suppliers. For example, Japanese auto parts buyers find that "stability" in quality management and a culture of "continuous improvement" is must, but both of these requirements are not observed. follow by local companies, thus resulting in less orders.

Overall, there is some evidence that lack of information is an obstacle for suppliers in key areas. However, there are government efforts as well as private sector efforts to address FDI information asymmetry, their sourcing strategies and standards, such as developing database and launching trade fairs. Some supply-side constraints may not seem common to all firms, but many other hurdles can be seen when looking at specific industries or the entire business cycle.

3.4.2. External factors

3.4.2.1. Lacking industrial cluster

The alignment of Vietnam's supporting MEs is currently a problem in both ways, which is the lack of domestic clusters and the linkage to international supporting businesses. Almost all of the enterprises supporting Vietnam are very sporadic, and the state has not really supported the building and creation of supporting industry clusters to promote the domestic supporting industry. It is showed that supporting industry clusters and linkages between firms are important. Especially when the firms are too small to compete with foreign firms in the supply chain alone. Currently, most businesses have links to produce products because most businesses do not have enough machines or techniques to handle all stages of each production stage. For example, many enterprises supporting MEs in Vietnam in the mechanical industry do not have anti-static spraying machines. After being processed through CNC machines, stamping, punching, and grinding, if possible, electrophoresis paint is required, businesses will associate with paint companies to hire paint for output products.

This association is only based on a single service purchase agreement but often does not have a close linkage to jointly develop a project or a specific product. The lack of supporting business clusters also limits the exchange of information and technology in the industry, indirectly slowing down the growth of supporting industries.

Besides, very few Vietnamese businesses have international links. For countries with supporting industries, in many countries, amount of auxiliary products exported is up to 60% of the total production. Therefore, MEs companies in these countries often have cooperation with many international enterprises in the same supply chain to meet market demand and participate more deeply in the international supply chain. Vietnam lacks both domestic supporting industrial clusters, but the linkage outside of the country has not been focused and facilitated. Many Vietnamese enterprises want to seek cooperation but face many difficulties due to lack of information and support from the government due to the lack of policies for cooperation and development of supporting industries. In recent years, the state has only had a few solutions to help Vietnamese businesses link with Japanese enterprises, but it has not yet brought high efficiency.

3.4.2.2. High competitiveness with FDI investment wave

Vietnam is considered a good land for high-quality foreign direct investment (FDI) inflows from the trend of shifting production away from China. IMF experts said that many large international corporations and enterprises are looking for investment opportunities to diversify the supply chain and limit the over-reliance on the Chinese market. Vietnam has become one of the brightest candidates to welcome this shifting capital flow. In addition, the positive outlook of Vietnam's economy after reopening, the large population and increasing number of people joining the middle class are also favorable factors to attract investment. In fact, the non-FDI sector in Vietnam contributes up to 80% of GDP and 92% of total employment, but productivity is much lower than that of the FDI sector. Most investment sources come from Asia, with Korea, Japan and Taiwan leading in this investment wave and focusing on metal fabrication, rubber, plastic, computer and electronic equipment, while less than 1% of foreign businesses poured capital into the agricultural and mining sectors. Therefore, the wave of FDI investment will increase competition in the near future for Sis.

Compared with the supporting businesses of DFI, Vietnamese businesses exhibit more limitations in many aspects: capital, technology, production process, operation

management...Without rapid learning, improvement and change, it is difficult for Vietnamese MEs to penetrate into the supply chain of the industry.

3.4.2.3. Issues of policy

Identifying SIs to play a important role in economic restructuring, improving productivity and labor skills, added value and competitiveness for products and quality of the economy, the State has issued implementation of the master plan for development of SIs to 2020, with a vision to 2030. In which, by 2020, there are about 1,000 enterprises capable of supplying assembly companies and MNCs in Vietnam. By 2030, supporting products will meet 70% of domestic manufacturing and consumption demands, accounting for about 14% of the industrial production value, about 2,000 enterprises can afford to supply for large corporations in Vietnam. To achieve this goal, the Government has introduced many supporting policies such as Decree No. 111/2015 / ND-CP on development of SIs or Decision No. 68/QD-TTg dated January 18, 2017 approving the SI development programs for 10 years from 2016 to 2025. However, most of Vietnamese enterprises said that these policies have not been effective. The number of enterprises in SIs currently accounts for only 4.5% of the total number of companies in the manufacturing and processing industry. The net revenue of production and business of Vietnamese supporting producers is estimated at 900,000 billion VND/year, contributing about 11% of the total revenue of the processing and manufacturing industry.

The scale and development capacity of SIs in general and of Vietnamese MEs in particular are still very limited. The number of supporting MEs is still small, production capacity is not high, HR have not met the requirements due to lack of investment capital. The financial capacity of the SIEs themselves is weak and they face great barriers in accessing government capital, limited technological level, low product competitiveness, and many products not meeting quality requirements as well as technical compatibility, difficult to consume. Moreover, a number of preferential policies to support the development of SIs such as Decree 111/2015 / ND-CP when re-implementing the "problems" of other specialized laws such as Land Law, Law on Groups Credit institutions, Bidding Law... Policies on credit incentives, taxes, land rent, especially resource allocation to implement supporting policies have not been concretized... causing enterprises difficult to borrow. The implementation of policies on SI is still limited, has not created mandatory sanctions to comply in allocating

resources for implementation. The binding relationship between incentives for firms producing complete products and obligations towards SMEs has not yet been legalized.

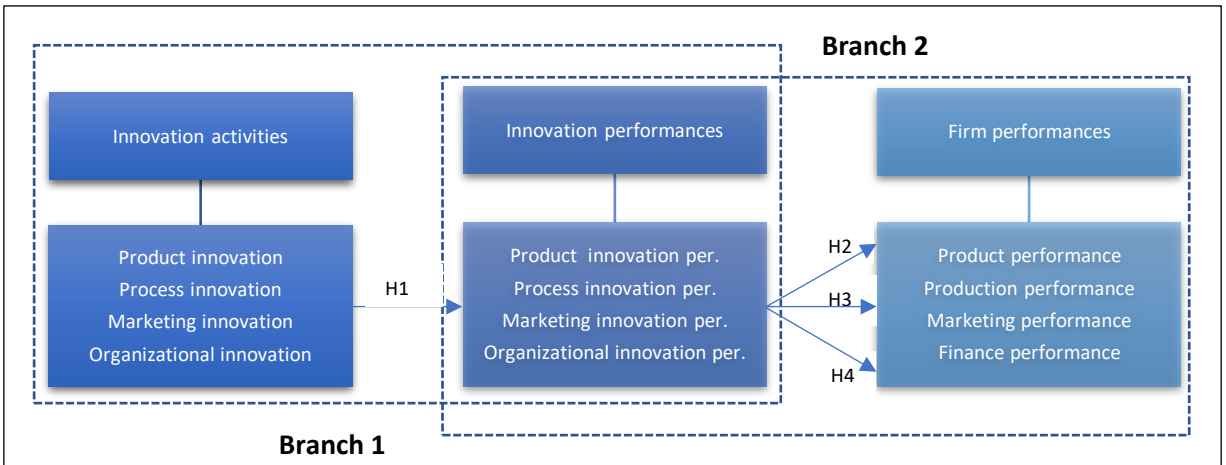
Up to now, Vietnam has not had an industrial ecosystem to create a favorable environment for the mechanical, automotive and other SIs to develop. The space for policy intervention to develop the mechanical and automotive industry, especially the requirements for localization and use of domestic products... is narrowed due to the implementation of international commitments. This issue also makes the development SI difficult. Therefore, if we want to build a developing SIs system that catches up with the development of major industries, the Vietnamese government should focus on completing and implementing effectively and synchronously mechanisms and policies and ensure favorable conditions for industrial development, creating a basic foundation for promoting industrialization in an innovative and sustainable direction. At the same time, to review and develop new mechanisms and policies in line with international integration commitments to support the development of SIEs.

3.5. Review solutions, innovation and result in Vietnam

To evaluate or review the results or effectiveness of improvement and solutions of Vietnamese enterprises, we can consider activities and performance on four aspects: product, process, marketing and organization improvement. Figure 3.13: shows the correlation between activity and performance of innovation for the firms in the supply sectors and the firms in SIs in particular. According to the survey results of JETRO and VCCI of 150 SI companies in Vietnam in 2018, they focused heavily on firms in SIs of mechanics, electronics, motorbike and automobile - because the number of companies in these SIs is growing and improving in recent years. The survey involves 4 parts including general information, innovation activities, innovative performance and firm performance. Innovation activities include product innovation, process innovation, organizational innovation, and marketing innovation. Innovative performance consists of product innovative performance and process performance, organizational and marketing innovative performance with scale ranging from: 1 - strongly disagree, 2 - disagree, 3 - neutral, 4 - agree, 5 - strongly agree. The survey is made with 150 questionnaires and they received 131

feedbacks from companies. Among the 131 feedbacks, there are only 118 valid data, accounting for 78.7%.

Figure 3.13: Hypothesis of the effects of innovation on firm performance



"Branch 1: The relationship between Innovation activities and Innovation performances.
Branch 2: The relationship between Innovation performances and firm performances.
Hypothesis H1: The higher the level of innovation activities is, the greater the innovative performance is.
Hypothesis H2: The greater the innovative performance is, the greater the production performance is
Hypothesis H3: The higher the level of innovative performance is, the greater of the market performance improvement is.
Hypothesis H4: The higher the level of innovative performance is, the greater of the finance performance improvement is."

Source: Nham Tuan; Nguyen Nhan; Pham Giang; Nguyen Ngoc, The effects of innovation on firm performance of supporting industries in Hanoi-Vietnam, Journal of Industrial Engineering and Management (JIEM), 2016.

About the first model (H1), four dimensions of innovation activities is Product Innovation, Process Innovation, Organizational Innovation, and Marketing Innovation that are independent variables while Innovative performances is an aggregate dependent variable. After regression analysis, the innovation activities explain 46.7% of the variance in innovative performances, and there is the positive impact of the independence variables on the dependent variables. Specifically, 3/4 dimensions of innovation activities (they are Process, Organizational and Marketing Innovation) have the impact statistically on innovative performance which Organizational Innovation contributes the greatest proportion then Process Innovation and Marketing Innovation are number 2 and number 3, respectively. Finally, Product Innovation has no influence on innovative performance as the result of the survey.

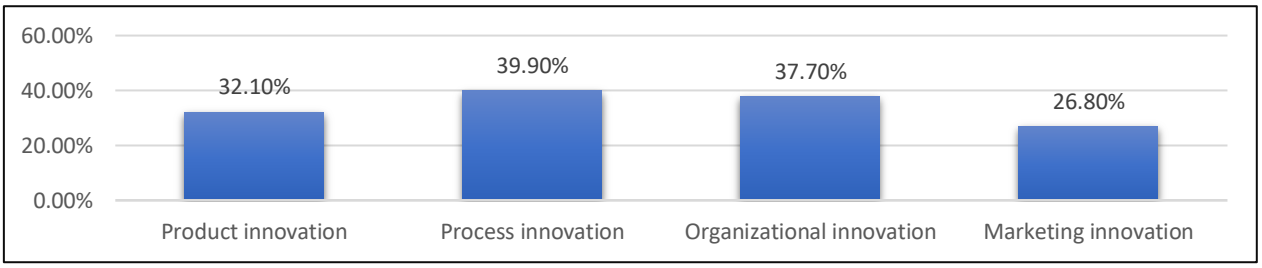
Independent variables:	H1	H2	H3	H4
Adjusted R2	0.467	0.337	0.379	0.289

For three models of branch 2 (H2, H3, H4), four dimensions of innovative performances – including Product innovative Performance, Process innovative Performance, Marketing innovative Performance, and Organizational innovative Performance- are considered as independent variables for these three models while production, market and finance performances are dependent variables of model H2, H3, H4, respectively. As the result of analysis, the innovative performances impactsto 33.7% of production performances, 37.9% of market performances and 28.9% of finance performances. More specifically, Process innovative Performance, Marketing innovative Performance, and Organizational innovative Performance have the statistic significant impact on those 3 models while Product innovative Performance shows no influence into any performances of the companies. About H2 and H4, Process innovative Performance have the greatest affect on Production Performance and Market Performance while Organizational Performance and Marketing Performance play the second and third important roles, respectively. To turn to model H3, Organizational Performance becomes the most important factor which affects Finance Performance while Process Performance and Marketing Performance come second and third vital factors, respectively.

About branch 1, the hypothesis H1 related to the impact of innovation activities on innovative performances, it is supported by Process, Organization and Marketing innovations, while Product Innovation don't have any support for innovative performance at all. with branch 2, the hypothesis H2, H3, H4 related to impact of innovative performance on firm performances, all four types of performances, are supported by Process innovative Performances, Marketing innovative Performances and Organizational innovative Performances, while Product innovative Performances have no support for any firm performances. Base on the results of the analysis, it shows that many companies focus on process, organizational and marketing innovation activities rather than product innovation activities. This is real status of SIEs in Vietnam when they just received orders of specific products from assemblers who already designed models of products (EMS companies). In that case, it is really hard for SIEs to innovate the models. Therefore, they tried creating solutions for process, organizational and marketing activities. Moreover, in terms of level of impact among process, organizational and marketing innovation, marketing innovation activities are at least impact level on performance. It reflects a fact that firms in SIs may have

long-term relationships with assembly companies. In other words, they usually work with a limited number of vendors. In that situation, enterprises in SIs seem not to focus on the marketing innovation activities much.

Figure 3.14: The rate of innovation in SIs in Vietnam



Source: First-Nasati project, Improve national labor productivity, Ministry of Science and Technology.

According to statistics from the Ministry of Science and Technology, about 32% of all enterprises in supporting industries have product innovation activities (Figure 3.14). The regular implementation of product improvement and new product launch is an objective requirement for businesses, especially businesses that manufacture consumer goods such as garments, cosmetics, paint, shoes, ... to diversify products, to meet the needs of customers according to the changes of external factors such as weather, environment, fashion, tastes...Process improvement is the activity most businesses do the most with nearly 40%. Process improvement activities includes technology improvement, machine improvement, production method, material substitution and so on. It can be explained by investment in research activities. Researching and improving the existing production process is less expensive than investing in new machinery, equipment and technology lines, while still making a positive contribution to improving product quality and productivity, making innovative products or new products. This is also an activity that is of more interest to all subsectors of Vietnam's supporting industry due to current financial constraints.

The second most interest in innovation activities among businesses is organizational innovation related activities. Most of the past, SIEs were still weak in the traditional organization and management stage. Learning and integrating into the international business culture when there is a lot of foreign investment has prompted businesses to improve their organization to improve business efficiency and minimize administrative costs of management and administrative procedures. Many large and medium sized support businesses have adopted many management systems and science and technology to

minimize manual and manual management to automatic management such as ERP, SAP, CRM .... charges or small expenses via cloud computing. Currently, about 38% of enterprises have been implementing organizational improvement measures according to statistics of the Vietnamese Ministry of Science and Technology. SIEs have less conversions with marketing than other innovation activities. Most of the products of enterprises and intermediaries are not the final products and are distributed directly or directly to the end consumers, so this activity is only 26.8% of the businesses interested.

Since Vietnam is the end of attracting sources to FDI and multinational enterprises, businesses have begun to pay more attention and focus on searching for solutions and improvements because they understand the importance of it. With increasing pressure from competition and growing to survive, innovation has become the activity businesses support efforts to do. If in the period 2012-2015, businesses have access to fundamental, simple and very specific innovative tools such as: 5S (Sort-Set in order-Shine-Standardize-Sustain), 3D (Directing– Discussing - Delegating), Lean, Kaizen ... These are innovative tools that have been applied by many Korean and Japanese businesses and achieve high efficiency in improving the quality of products, production, organization management, contribute to reduce costs and improve business efficiency. Because of this time, many Korean and Japanese FDI corporations and companies have invested in Vietnam, but the learning and acquisition of solutions and improvements in production and business have quickly become popular.

In the recent 2016-2020 period, manufacturing industries and supporting industries have introduced many new innovative methods such as the overall productivity improvement (TPM) model based on 4 pillars: Phat developing customer-oriented organizations; applying and continually improving technology; process management; continuously minimizing waste. And there is no denying the positive results of these innovative solutions. For example, the TPM model of improving overall productivity has increased the productivity of businesses by 20-23% or more by synchronizing technology innovation and perfecting the corporate governance system, improving the satisfaction of businesses. customers (statistics for 24 enterprises producing supporting products in Vietnam by 2020 of the Ministry of Industry and Trade of Vietnam). Specifically, Phu Tho

Textile Co., Ltd. has completely solved the "difficult" problems of the machinery. During the first period of implementation, the group reduced the number 1 machine ring jam error from 27 times / month to 5 times / month; In the end, there was a 96% reduction in the number of ring jams occurring at the client. Or as TOMECO An Khang Mechanical and Electrical Joint Stock Company has deployed TPM very successfully. To become a supporting industrial satellite in the future, for many years, the Company has implemented many quality management systems according to ISO 9001: 2015, ISO 5801: 2007, participating in many projects of JICA, WB ... aim to perfect the management system and improve labor productivity, increase the competitiveness of enterprises. However, according to the enterprises' assessment, the measures are not really effective. Although in 2018, the Company invested heavily to innovate technology, procure modern equipment, but the Company could only produce 60-70% of its designed capacity. On-time delivery rate is 60%. Many causes of slow delivery but cannot be resolved... With the above problems, with the desire to fundamentally change perceptions about improving productivity from leaders to employees of all As a result, after implementing the TPM model, the export value of TOMECO An Khang Mechanical and Electvrical Joint Stock Company has increased by more than 100% in 2019 compared to the original target of 30%.

Chapter 4 Innovation and solution for Medium-sized enterprises

4.1. Innovation and solution for MEs in SIs

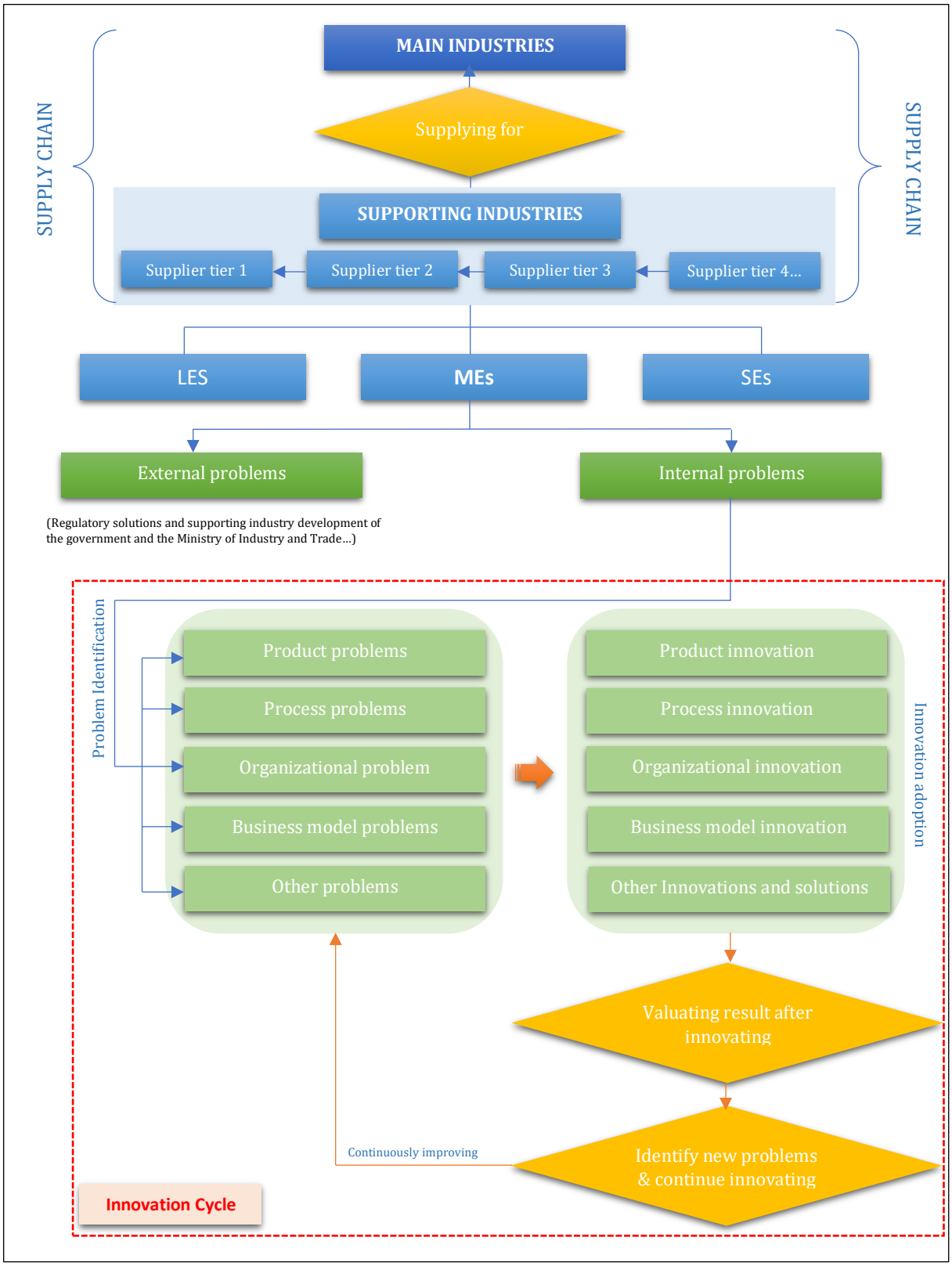
4.1.1. Innovation and Solution Model Designing

Figure 4.1 is an Innovation and Solution Model designed for supporting MEs in Vietnam to overcome the current major problems that most of these enterprises are struggling with to enter the domestic as well as international supply chain. Not many Vietnamese MEs can become tier 1 suppliers of multinational corporations, but if they have the right solutions and strategies, they can start joining the global value chain by becoming tier 2 suppliers or even tier 3 suppliers. It is an important step to develop business and become strategic suppliers for large firms in the future and in the long term.

This model only focuses on solutions and enhancements for supporting MEs, which means overcoming internal and internal activities problems without mentioning external macro solutions like support, regulation or policy of the government and the Ministry of Industry and Trade or other relevant ministries of Vietnam. Because macro factors mostly affect many sectors in the entire SIs, not just MEs. Moreover, it is difficult for enterprises themselves to influence macro factors that must be adapted and regulated in accordance with government regulations or policies.

Every business that wants to participate in the supply chain must identify the problems that they are facing to find corresponding solutions. For MEs in SIs, obstacles to joining the global supply chain mainly revolve around 5 basic problems: Product problems, Process problems, Organizational problems, Business model problems and other problems. For each problem, manufacturers can build improvements and solutions for itself or can improve one or more other elements to achieve the desired goal. For example, if an enterprise has a problem with current product that needs to improve its quality in order to meet customer requirements, in addition to implementing product improvements such as research to improve product quality, producers can also consider improvements in manufacturing processes (machines, processes, quality control for manufacturing process: IQC or OQC ...) because the manufacturing process also has a huge impact to the quality of the output products. In other words, manufacturers need to apply many solutions and improvements for a problem to create a higher and more comprehensive effect.

Figure 4.1: Innovation and Solution Model Design



Source: Author

The improvement process is continuous, after applying and implementing solutions and improving the evaluation of the results of applied solutions is extremely necessary. Not all improvements can produce the expected results because the results of the improvement process depend on many factors, but only when applying them in practice can the enterprise discover new emerging problems. After each process of improvement and evaluation of results, companies need to continue to identify new problems for their businesses and continually improve. Because it is only practical innovation cycle, new businesses can grow constantly and achieve outstanding business efficiency.

Choosing which solution and improvement, one or a combination of many options depends very much on the problem that enterprises are facing as well as the potential of the business themselves. For example, MEs will have difficulty in capital if they improve their processes through the purchase and investment of both new and modern machinery systems to produce high quality and high-yield products. At this time, processes and technology improvement options based on existing systems of machines and technology are preferred and more appropriate. The important thing is to constantly innovate, businesses not only need to get better every day, but more importantly, need to be better and outperform their competitors.

The next sections of the paper will provide more detailed information about each of the improvements and methods. At the same time, analyzing each type of improvement to see more clearly the direction of supporting MEs should choose based on existing difficulties and resources to achieve high efficiency in business operations, contributing to accelerating the process to paticipate the global supply chain.

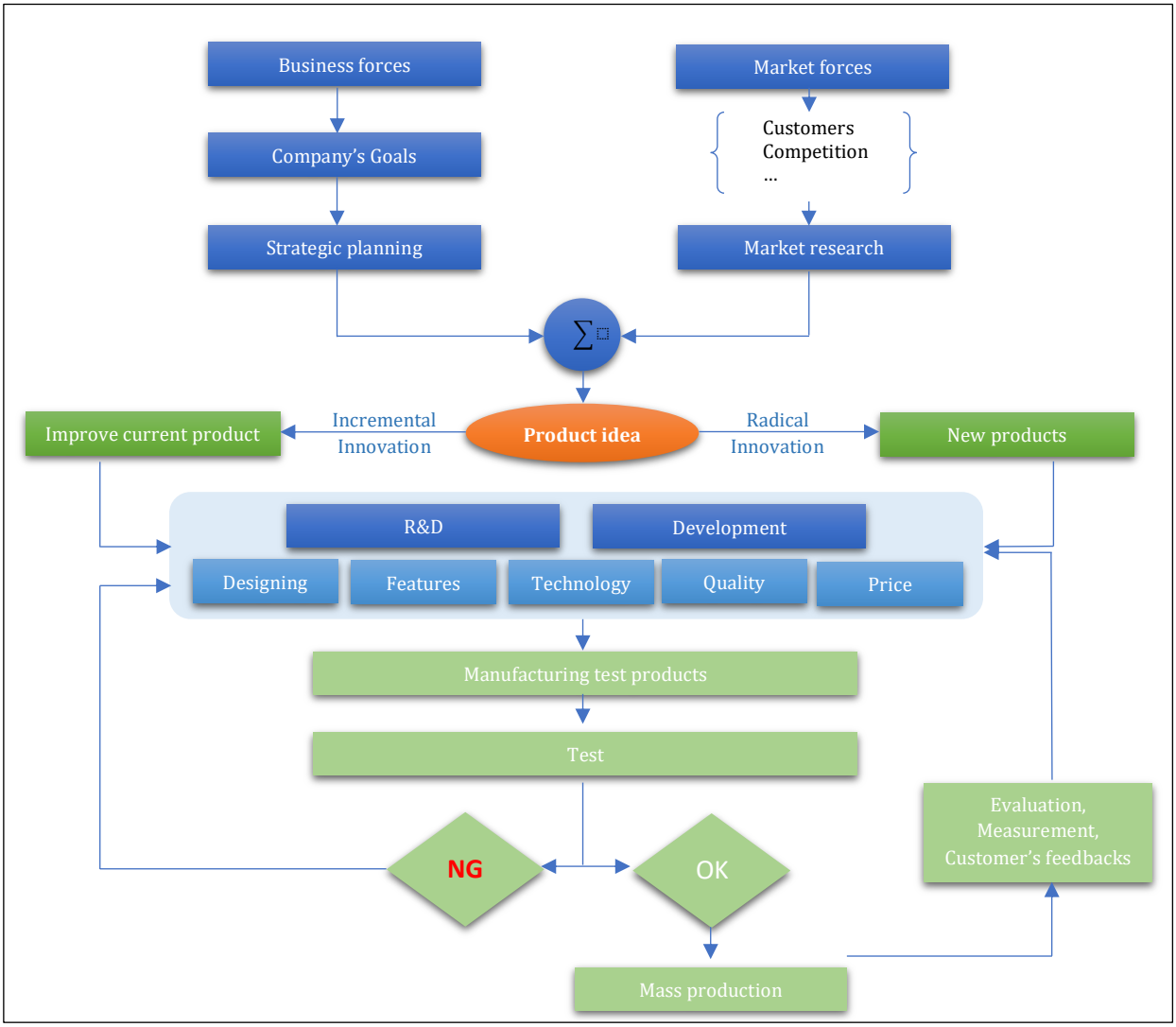
4.1.2. Innovations and Solutions

4.1.2.1. Product innovation

The SIEs do 2 main types of innovation normally: Radical innovation and incremental innovation. Radical innovation is researching and producing a completely new product compared to the existing enterprise products to enter the chain. Innovative solutions to create new products are implemented more frequently in the textile and footwear SIs due to the industry's characteristics of changing models and types of products that often change according to fashion trends and market demand. In high-tech SIs such as electronics,

automotive, or mechanics, incremental innovation is practiced in more than radical innovation. Incremental innovation is based on the advancement of existing products. In other words, these SIs often create new products on the basis of changing and improving the products the manufacturing is making.

Figure 4.2: Product Innovation Model for MEs in SIs



Source: Author

The decision to execute any form of product improvement, the creation of decision making must be based on a product idea. The concept of products supported by businesses builds on the synthesis and analysis of information from business forces such as company goals, company business strategy or market forces as based on requirements. of customers often forced to innovate to compete with competitors on the market.

After deciding how to improve the product, the improvement options will be developed through R&D and Development. The products of Sis are currently being improved on 5 main aspects: design change, functional improvement, technology change for products, improvement to improve product quality or with target to reduce product costs to improve competitiveness and maximize production and business efficiency.

However, there is a real shortcoming that most Vietnamese MEs do not have enough resources to invest in new product development or R&D, especially activities support the production of products in the automotive, mechanical or electronics industries. The main reason is a lack of funding and these departments often require high quality human resources, which are strongly attracted by large corporations or FDI companies with high remuneration. In many MEs, design or improvement is given to technicians, who take care of a wide range of products from product improvement to machine operation and handling of machining problems. The technicians are not many, there are manufacturers with only 2 or 3 people and do not specialize to focus on product innovation and development but also assume many other roles.

If MEs want to participate in the supply chain as well as compete with competitors, they must focus more on this issue. R&D needs more investment and producers should understand its importance in improved activities to join the chain and grow. Owning superior products will support MEs have opportunities to differentiate and outperform their competitors. Moreover, Vietnamese MEs are competing mainly with foreign suppliers such as Korea, China or Japan, which have a high technology and much more development than Vietnam.

After the research process, the samples will be manufactured and tested. Testing, measuring and evaluating improved products can be done by the company, with the customer or by both. However, most of the time, if customers request to send samples for testing, these samples need to be assessed and checked by the manufacturer first. If the samples are NG, the activities for improvement and sample production will be continued until the product meets the standards and requirements of the customer or the market. Enterprises can mass-produce after successfully entering the supply chain by receiving POs from customers or leading corporations. However, even when participating in the chain, product improvement activities must be done non-stop by gathering feedback from

customers, by measuring or evaluating products or simply is to improve products to reduce costs.

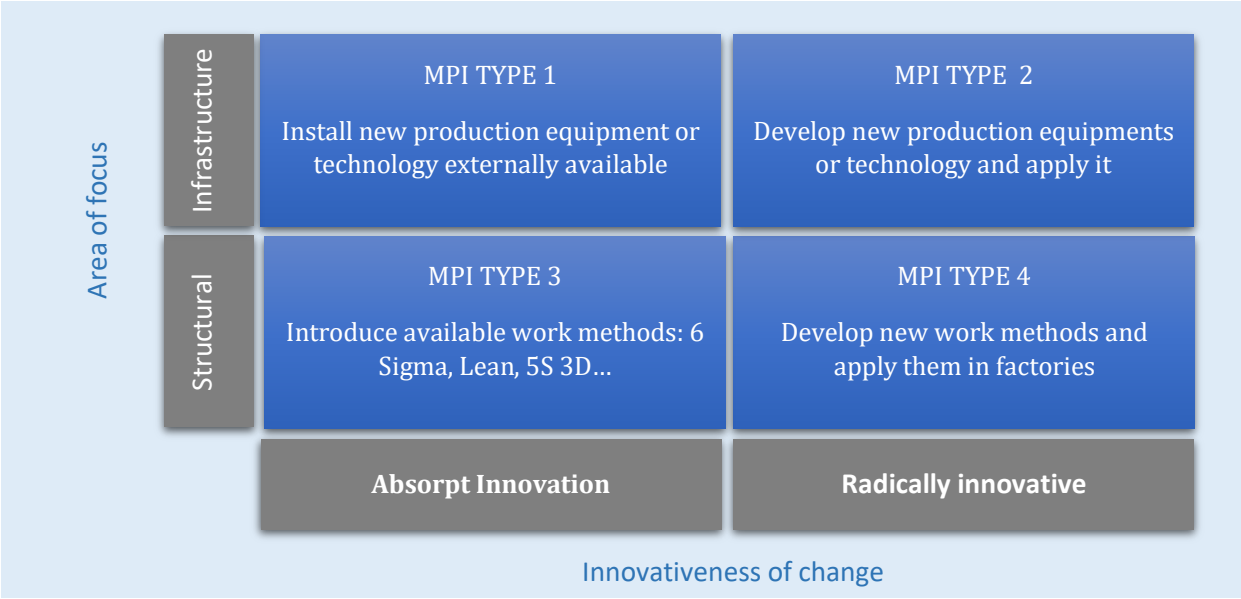
Many MEs are now able to produce quality products to supply chain of leading corporations, however the lack of quality in output quality when producing daily goods (high NG ratio), or not enough capacity to produce large quantities of goods in a short time or information related issues or how to access leading enterprises...MEs must have implemented many solutions and improvements associated with product improvement. The advantage that Vietnamese MEs have is that the cost of production in Vietnam is quite low, and the on-site production and supply gives Vietnamese firms an advantage in price competition. At the same time, thanks to attracting capital, leading enterprises in Vietnam are quite large. Not only MNC corporations such as Samsung, LG, Intel, Toyota ... Vietnam also has large companies leading the supply chain such as Vingroup (Vinfast, Vsmart...) or Viettel contribute more conveniently for Vietnamese firms to participate in the international supply chain. Because the long-term advantages of leading Vietnamese enterprises can contribute significantly to the rapid development of Vietnam's SIs and the MEs of supporting industries have more opportunities and advantages supply spare parts, components or spare parts.

4.1.2.2. Process innovation

For 4 key SIs of Vietnam Food processing, Textile Apparel and Leather - Footwear, Electronics, Fabricated metal and machinery & equipment, Automotive, the production activities are the main activities, the supply activities of services are negligible. Innovation processes also largely revolve around manufacturing. Therefore, the solutions and innovations in this chapter will be developed for the MEs in manufacturing - Manufacturing process innovation (MPI).

An MPI is an attempt to change or redesign an existing production process or process in order to achieve a desired purpose such as creating a new product, a change in the quality or performance of the output product to improve productivity or reduce production costs ... And of course, like other forms of innovation, MPI is the ultimate goal that a business in general and MEs in particular do not improving existing elements only. Being better is not enough, they need to be better than their competitors. When building and designing MPI, in addition to defining internal factors, the research of external factors is also very important.

Figure 4.3: Main types of MPI



Source: Author

MPI TYPE 1: Installing new production equipment or technology externally available. Although these machines and technologies are completely new to businesses but not new to the industry, businesses can completely learn and absorb technology from competitors or other businesses. However, MEs will face difficulties because this process innovation requires a large investment capital, enterprises may have to buy more new machines or technology and spend money on equipment installation of manufacturing activities or maintaining.

MPI TYPE 2: Develop new production equipment or technology and apply it. This type of innovation can be said to be more suitable for large enterprises because it requires a relatively large initial investment and is more risky than other MIPs. This means that if the enterprises themselves research and develop completely new production machines and technologies, it will be a huge competitive advantage and will create a big gap compared to competitors in the same industry. When competitors can catch up, these firms may have advanced deep into the supply chain and have a position in the chain. While this is often difficult for MEs to adopt or implement this innovation because the requirements for this activity are high, it is by no means impossible. Currently, Vietnam has a lot of projects of the Ministry of Industry and Trade and the Ministry of Science and Technology to develop and promote domestic SIs, by participating in the projects of government organizations and with

the support from these projects, a few Vietnamese MEs have successfully created their own new technology machines, to create products that are not inferior to imported products.

MPI TYPE 3: Introduce available work methods: 6 Sigma, Lean, 5S 3D… This is probably the most innovative form of process supported by many enterprises today. When large corporations enter Vietnam, it is very difficult to acquire technological know-how. It is a trade secret that most corporations do not transfer technology to Vietnamese companies. What they can learn is getting trained human resources of large corporations, learning the work methods that large corporations are applying to improve their production processes, helping to improve capacity, product quality or standardize production activities like MNCs. The tools that many MEs businesses have successfully applied are 6 Sigma (in order to improve product quality, reduce defect rate), Lean, 5S3D, Kaizen, warehouse management processes, materials... These improvements are favored by widely disseminated information, with small but highly effective improvements, in addition to being easy to deploy.

MPI TYPE 4: Develop new work methods and apply them in factories. This type of innovation has a similarity to Type 2, an innovation method that is relatively difficult to implement compared to MEs. However, MEs firms still have the ability to adopt this innovative approach. A typical example is the improvement method: the overall productivity improvement (TPM) model has been researched and tested together by the Ministry of Industry and Trade and enterprises in the period of 2016 to 2020. Improvement effects Productivity improvements in manufacturing firms clearly demonstrate that this mode of improvement is also a form of improvement that should be considered if MEs have the opportunity and ability.

The main activities of process improvement start with preparation: the company needs to identify the improvement objective, at what stage the process needs to be improved, and prepare resources for improvement such as capital, human resources. (need training or guidance), technology... then MEs need to design improvement processes: lack of new process design, prototyping, evaluation of alternative improvement processes or estimation of regulatory effectiveness. post improvement. After implementing innovated process, businesses need to analyze and evaluate the results to continue to improve the contained or failed aspects as the initial target.

4.1.2.3. Organizational innovation

Organizational innovation is sometimes done separately by enterprises with the goal of changing the structure or organizing the diagram to improve labor efficiency or cut down on channel personnel but with poor efficiency. In MEs, organization charts are often more flexible than large enterprises, but there is also a gap of lack of specialization and ineffective human resource or responsibility when problems are happened. Newly operating organizations are often combined with other operational change organizations, such as changing new products, processes or business strategies. By every change in business, as request change personnel or business apparatus is weak equipment. A new product development strategy, for example, often requires changing the production process and there are requirements for different organizational structures.

Implementing organizational innovation in a company is more sensitive than other types of innovation, creating many challenges for the business because it relates directly to the people or the human resources of the business. Organizational reform will also have a great impact on the working environment, corporate culture or the spirit of the employees. but need to be carefully considered over the long term and its impacts. With the organization structure of traditional business culture, MEs should consider reforming the organizations. Learning the organizational chart or management of foreign corporations or leading corporations is essential to be able to understand and participate in the chain. Even large corporations in Asia want to develop and move further into the international market, they must constantly learn the management or organizational design of European or American corporations, especially from countries. have a developed economy. For example, Samsung, a leading corporation in Korea, still has a highly hierarchical organizational chart (a common characteristic of most traditional Asian businesses), and junior employees often have no chance It's very difficult to give opinions to senior managers and top managers, however in order to encourage employee creativity that Samsung has improved the organization, employee contributions can give suggestions. Their innovations come directly to the board while the old traditional structure does not allow low-level employees to freely do so or express personal opinions.

It can be seen that it can be difficult to build a common business improvement model for the SIs because each business is organized and structured differently, and businesses also need to change according to other needs. The factors that affect each organization are also different. However, it is possible to list some of the typical types of organizations that support MEs is applying, the characteristics that these types of organizations possess to give some innovative ideas that they can be referenced as below.

Table 4.1: Main organization structures of Vietnamese MEs and Innovative potential

Organization archetype	*Key features*	*Innovative potential*
Simple structure	A company is centrally controlled by one person or some people so they respond quickly to changes in the market. Businesses change and innovate easily and often.	Often lack of resources for improvement activities, such as no R&D department => focus on building important parts even though resources are limited
Bureaucracy	There are many employees with long experience but lack of creativity, high stability in organization. Slow response to changes in the market, slow growth	Learning to reform organization chart from foreign corporations is essential, it is necessary to reform to operate and change flexibly with fluctuations and improve labor efficiency of the organization.
Professional bureaucracy	A decentralised structure form which accords a high degree of autonomy to individual professionals. The individual experts may be highly innovative within a specialist domain, but the difficulties of coordination across functions and disciplines impose severe limits on the innovative capability of the organization as a whole.	Significant improvements have been made and learned from other modern businesses. An applicable business organization reform option is to rotate employees across multiple departments or under separate projects to enhance experience and comprehensive understanding while increasing cohesion at work.
Divisionalized form	A decentralized organic form in which quasi-autonomous entities are loosely coupled together by a central administrative structure. Typically associated with larger organizations designed to meet local environmental challenges	An ability to concentrate on developing competency in specific niches. Weaknesses include the 'centrifugal pull' away from central R&D towards local efforts, and competition between divisions which inhibit knowledge sharing
Adhocracy	A highly flexible project-based organization designed to deal with instability and complexity. Problem-solving teams can be rapidly reconfigured in response to external changes and market demands. Typical examples are professional partnerships and software engineering firms	Capable of fast learning and unlearning; highly adaptive and innovative. However, the unstable structure is prone to short life, and may be driven over time toward the bureaucracy

Source: Author

The main steps in organizational improvement still revolve around a few key things: Defining improvement goals and objectives -> Building improvement models-> Applying organizational improvement-> Evaluating improvement results Progress-> Continue to improve incomplete points or according to new improvement requirements.

4.1.2.4. Other innovations and solutions

Building clusters-sharing of information and technology: There are many barriers for businesses to support MEs participating in global supply and value chains such as lack of information, limited level of management technology, production technology, quality of human resources. Enterprises hardly have the ability to accumulate capital to invest and lack capital to develop independently, lack of solutions to improve productivity, improve product quality to meet the stringent requirements of MNCs. In addition, there is a reluctance to upgrade standards to make a breakthrough because of high risks and no guidance... Most of these problems can be overcome if enterprises support Vietnam aids can link up and build SI clusters for mutual development. In countries with developed SIs, SI clusters are always focused and created very early. For SMES, the existence of SI clusters play an important role to support these companies participating in the supply chain. Manufacturers can link together, exchange technologies and jointly implement joint projects to focus resources and compete with large enterprises. After developing strongly and sufficiently, they can split up and develop independently. Industrial clusters also help absorb underground information of the industry faster, technologies and innovations are strongly shared. SIs of Japan is a successful case study and show off the important of SI zone and clusters. Japan's Sis evolved in a different process, and in a different context. They have developed a strategy of 100% import substitution, not using foreign investment, but only buying foreign technology. They assemble almost all of them in one (or a group) company. During the development of the company (group of companies), the scale is growing, the producing parts with separate technological processes splits into subsidiaries (independent), this subsidiary system form a major part of SIs. A second part is the traditional mechanical processing villages. They had mechanical engineering, but before the development of the auto industry, they made everything from cutlery, to tools and simple construction machinery but also using cutting

techniques and metal cutting skills. Later, there were orders from car manufacturers of motorcycles, at that time they made orders, long ago became specialized.

Currently, in addition to the efforts of enterprises themselves, Vietnamese government is also promoting and facilitating the building of SI clusters to connect businesses. In 2019, Bac Ninh province established Cach Bi SI Cluster (Que Vo District) and Tan Chi 2 SI Cluster (Tien Du District). Two SI clusters with a total investment of more than 1,600 billion VND are expected to bring a new face to the key electronics industry. Accordingly, Cach Bi SI Cluster was built in Cach Bi commune, Que Vo district, with a total planned area of about 72 hectares, total investment of 957.6 billion VND. In which, the investor's equity is 191.5 billion VND, the rest is mobilized from commercial banks. In this year, Tho Nguyen industrial cluster in Thanh Hoa is also under construction, covering an area of about 20.0 hectares with a total investment of about 100 billion VND, established in Xuan Hong commune (formerly Tho Nguyen commune). Tho Xuan district, an area of about 20 hectares, get the main business activities: Mechanical; SI for garment and textile industry, producing construction materials; processing agricultural and forestry products; manufacturing machinery and equipment for agriculture and forestry; production of consumer goods; garment, footwear... and other related professions. MEs should have specific solutions to connect with clusters to create momentum and participate in the supply chain with other businesses.

Invest into R&D and HR training: As analyzed above on the importance of R&D to the SI, despite limited capital resources, in order to develop, Vietnamese MEs need to invest more strongly in R&D activities. Only when there are products that outperform FDI enterprises or imported products do the MEs have the opportunity to join the GSC. In parallel with investment in research, HR will be an important contributor to the success of product development or innovation activities. Only when an enterprise has a staff of highly qualified, suitable with current technology, can R&D activities bring about results. There is an advantage that Vietnam's HR resources are being improved in terms of quality, but professional training activities still need to be interested by MEs, because few staff can fully understand and the whole working processes. Only when owning a highly skilled and professional workforce, the productivity can be maximized.

Different with large corporations which often have separate training departments and training programs from workers to senior managers, MEs can take advantage of training programs from outside: from groups professional training organization or from the exchange and learning between companies in the cluster. Every year, the Ministry of Industry and Trade of Vietnam cooperates with leading corporations such as Samsung to organize activities and training programs for HR and experts for SIs to develop the industry, especially to promote the development of SMEs. This is an useful activity that MEs should care about if they do not have a lot of money to organize training for their employees. MEs can apply for the program with the Ministry of Industry and Trade of Vietnam. Currently, the Ministry of Industry and Trade is organizing annual training courses with 06 training courses (03 training courses in Hanoi, 03 training courses in Ho Chi Minh City) ended with 150 trainees (of which, 28 most excellent trainees have completed an intensive training course in Korea), the number of enterprises participating in improvement practice is 30 enterprises. After completing the course, many trainees participated in the project "Organizing production improvement for manufacturing enterprises, SIEs in Vietnam" under the SI Development Program in 2019 hosted by the Center for Industrial Development Support. By November 2019, to complete the improvement process for 62 enterprises in Vietnam (35 enterprises in the North, 10 enterprises in the Central and 17 enterprises in the South). In addition, 30 enterprises participating in the improvement implementation program achieved clear results and positive feedback, improved the competitiveness, improved access to and participated in global production and supply chain. With these positive results, the Minister of Industry and Trade proposed that, in the near future, the Ministry of Industry and Trade and Samsung Vietnam will sign a Memorandum of Understanding (MOU) to implement the Project of Model Human Resource Training Cooperation.

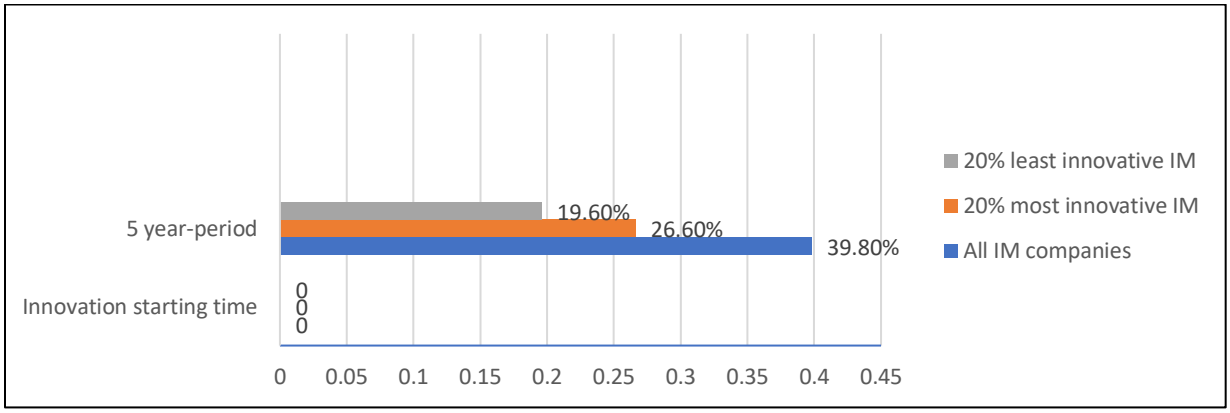
Not only limited to expertise, training knowledge, R&D investment capital and obstacles, supporting MEs can utilize external support resources such as participating in research projects for improvement or training by ministries as the example above. These programs will bring significant benefits not only to the company's own HR and reduce cost of R&D activities, but also are an opportunity to connect with large corporations. This is an

important point because the opportunities to join these networks are now quite difficult for local businesses.

4.2. Predict and measure innovation outcomes

Overall, the most innovative companies are growing significantly faster than the least innovative enterprises. According to PwC's Global Innovation Survey's survey of industrial manufacturing, the difference between companies with innovative activities and those with little or no innovation is huge. While the most innovative companies saw an average growth rate of 11.3% per year, least innovative companies experienced only 3.2%. Or there is a strong link between innovation activities and revenues as Figure:

Figure 4.4: IM's top innovators expect to significantly outperform the rest



Sourc: PwC, Breakthough Innovation and Growth

**Base: Industrial manufacturing, 249; most innovative 20% of industrial manufacturing respondents, 46; least innovative 20% of industrial manufacturing respondents, 57*

The impact of innovation on revenue for industrial manufacturing (IM) is also very positive. Revenue disparities of up to 20% can be seen over the five-year period between 20% most innovative IM and 20% least innovative IM. While the revenue of the least innovative group increases about 19.6%, the most innovative group grow 39.8%. (Figure 4.4) 92% IM companies confirmed innovation is important to future revenue growth.

For Vietnamese supporting MEs, current solutions for growth and revenue are long-term goals. The immediate goal of innovation is to enter and penetrate the global supply chain, including for domestic and export FDI firms. With the current situation, investment and improvement are the only solutions to support MEs to achieve this goal because

otherwise the gap in technology, scale and quality cannot be shortened. Domestic firms and FDI or foreign firms cannot compete with their products.

4.3. Why it is designed for only SEs

The implementation of internal improvements and the implementation of practical solutions can be applied in all businesses, but in the Vietnamese SIs, these solutions are more optimal for with the MEs. Small businesses themselves can implement and choose appropriate innovations to improve labor efficiency and production efficiency. But considering participating in the global supply chain of industry, these solutions are not enough for small businesses. The fundamental problem that creates barriers for small businesses is capital and technology constraints. To compete with businesses in the chain, the increase in investment capital is the first answer to this problem.

In contrast for large enterprises, these innovation options may not deliver a breakthrough in business roadmap. Production efficiency can be improved but also limited. When businesses are deeply involved in the supply chain, product research and development to outperform competitors can become a strategy that deserves more attention in the long term. In other words, when the resources are no longer an advantage over competitors, the difference becomes the most valued competitive factor.

It can be said that, for Vietnamese MEs, they have more opportunities compared with other enterprises. Besises, it still exists many limitations due to the influence from traditional production and business methods. Therefore, the improvement activities not only support SIEs to minimize investment capital but also improve business efficiency and bring many great progresses if MEs follow the right direction appropriately.

4.4. Sample of successful Mes

4.4.1. Manutronics Vietnam Joint Stock Company

Company name : Manutronics Vietnam Joint Stock Company
Address: No. 7, TS5 Road, Tien Son Industrial Park, Bac Ninh, Vietnam
Establish: March 2003
Type of business: 100% Vietnamese capital
Investment: 24 million USD (June 2018)

Number of employees: 180 people

Main products: Electronic assembly services (PCBA) & optical discs

Production capacity: 1,200,000 chips per hour (only SMT according to IPC 9850)

Certification: ISO 9001-2015, ISO 14001-2015

Manutronics Vietnam is one of Vietnamese MEs in SIs participate into global supply chain successfully. Curently, the company is the tier 1 supplier of many big manufacturing cooporations such as Samsung, Canon, Panasonic, LG…. This company focus and apply many innovation activies, especially process innovation to improve the quality of products and increase manufacturing capacity. From 10/2012 - 5/2013, they applied Kaizen and 5S, Lean tools in production and achieved success. The program is implemented in 3 categories: improving productivity and quality, lean warehouse, prouction lines and work environment. As a result, the efficiency of the essembly lines increased from 78.09% to 86.7%, printing line efficiency increased from 46.7% to 70% and OEM packing line efficiency increased from 45.17% to 87%. From September to November 2017, Samsung consulting supported Manutronics Vietnam improving production, changing management thinking and working methods. The program reduced defect rate by 63%, increasing productivity by 20% - 35% for each improvement category.

Image of Manutronics Vietnam factories after applying innovations

From 12/2017 to 03/2018, after surveying and making plans, the innovation team has implemented a series of activities such as: reducing working time, increasing the productivity of printing lines, improving cycle time and the system to reuse NG products... After 100 days of implementation, productivity rate per person increased by 35%, 48% for

printing units and 11% for OEMs. At the same time, product quality is increased through the rate of scrap for embryos and lump plastics decreased by 13%, the rate of NG reduces to 17%. According to Mr. Phung Anh Tuan, the director of Manutronics Vietnam, becoming an enterprise in the supply chain of FDI enterprises is a tireless effort, commitment of the Board of Directors and determination to innovate and learn effective working methods. "Although we have become a supplier, but we are always conscious of maintaining and improving further. Without improvement, we cannot continue to develop and cooperate" - Mr. Phung Anh Tuan emphasized.

4.4.2. Hung Dung Company Limited

Company name: Hung Dung Company Limited
Address: Km 42 + 600 National Highway 5A, Lai Cach Ward, Cam Giang Dist., Hai Duong
Products: LED lights, supply of motorcycle parts, lubricants, bearings
Established Year: 1998
Number of Employees: from 51 - 100 people
Production capacity: Millions of products per year
Infrastructure: 4000 m2 storehouse, 1500 m2 operator and functional

Hung Dung Company is an enterprise located in the key industrial triangle in Hai Duong province. The company currently has 1,500 m2 of factories, offices and warehouses in a campus area of 17,000 m2, planned to build up to 4,000 m2 of factories, warehouse and operator 1500 m2 functions. The company is producing hundreds of thousands of sets of electronic components, light bulbs and electrical equipment every month. Before innovation, in 2013, the Company had to find it difficult to find customers, especially entering the supply chain of Japanese corporations like Jaguar.

In the past, machinery and production processes still had many shortcomings and very low technology, After improving, Hung Dung has achieved remarkable developments, including successfully participating in the global supply chain. . In which, the most important milestone of the company is that they signed a contract to supply parts for Japanese sewing machine Jaguar with the current quantity of about 500,000 parts per month. Thanks to the support of Japan International Cooperation Organization (JICA). Starting from the end of 2013, every two weeks and lasting for 8 months, JICA's Japanese experts from Hanoi to Hung

Dung factory to support in improving production process, management according to Japanese 5S standards.

The biggest changes and improvements the company has made during this time is the improvement of production and management. The factory's productivity has increased significantly, the employee's working efficiency has also increased, not to mention other costs saved. Just 2 years later, in 2016, they expanded another 2,000 m2 factory area to meet the rapidly increasing production demand.

"Our weakest point and also that of many other Vietnamese enterprises is management skills, not quality. I am confident that Vietnamese enterprises can produce a lot of components and spare parts that meet the market requirements, but we do not know how to manage, which makes the product cost often higher than imported goods, and also makes partners concerns about sustainable production capacity and delivery capabilities" Mr.Dung, CEO of Hung Dung company sai. Mr. Dung comfirmed the factory's productivity has increased significantly, the productivity of workers has also increased, not to mention other costs saved as innovation result. Two years ago, Hung Dung's production activities were not arranged and managed scientifically as at present. If that still exists today, it is unlikely that Jaguar has chosen Hung Dung as a supplier.

Image of Manutronics Vietnam factories after applying innovations

Chapter 5 Conclusion

Compared with many other countries in Asia with developed industries, both Vietnam's main and supporting industries are still relatively young and weak. However, Vietnam is one of the countries with an amazing and fast growth rate. In addition, there are opportunities from the global economic transformation and the US-China trade war. In the coming years, Thailand and Vietnam are promising to become alternative industrial production hubs for China, especially the electronics industry for mobile and computer products.

With the fact that more than 97% of businesses in Vietnam are SMEs, the number of SIEs is not only small compared to other countries in ASEAN with developed SIs like Thailand, but also mostly SMEs. The number of local MEs is not many. This is the biggest limitation for SIs in Vietnam. There are not many large firms leading and facilitating supply chain development and sharing advanced technologies or experiences. It is very difficult for SMEs to compete with FDI enterprises in Vietnam or overseas enterprises without the traction of the locomotive or the pure leading firms.

In addition to the increasing FDI capital, domestic enterprises are also being promoted to expand investment in production more than ever. In order to involve SIs to develop, first major industries need to be expanded. In the last decade, almost all large industrial enterprises (except for the traditional garment and footwear industry) were FDI enterprises and groups. Last 5 years, Vietnamese big cooporations such as Viettel, BKAV, Vingroup are on track to become leading companies in the supply chain.

However, the outside opportunities are not enough to motivate and suport these eterprises grow. Companies themselves also need to catch opportunities, change and improve in order to compete with foreign enterprises. There are many solutions that MEs can apply from product innovation, process innovation, organizational innovation or other innovations and solutions. Innovative models for manufacturing companies vary, because depending on the actual situation of the industry in which the business is operating and its potentials, strengths or weaknesses, they can choose and design innovation model for themselves. Improving limitations and increasing the level of competitiveness will

contribute strongly in order to create favorable conditions for SIEs. Although not many, but there are MEs in Vietnam participating in global supply chains successfully. Typically in the coming time, there will be a strong development of SIEs in the electronics and automative industries. Many experts predict that, in the next 10 years, due to the impact of US-China trade war, Vietnam and Thailand will be attractive destinations for FDI investment and are expected to become the world's new manufacturing factories instead of China. Southeast Asia is forecasted that it will produce and supply up to 70% phones, tablets and loptops demand of the world.

In addition to the policies aimed at promoting Vietnamese SIs from the Government, especially the capital and tariff policies, Vietnamese producers need to be more proactive in improving themselves. MEs will have the momentum to grow and leap faster if they choose and apply suitable innovative solutions. There is no common denominator to build or design innovation model for each enterprise because each company has its own strengths and weaknesses. In order to choose from one of the four main solutions of improvement (product innovation, process innovation, organization innovation or other innovations and solutions), the MEs in SIs need to identify their own problems and the goal of innovation. Each company can either carry out one innovation activity from time to time or apply multiple innovations at the same time.

Although the proportion of MEs in SIs in Vietnam is not high, the number of firms interested in innovation is even less, but more and more enterprises are becoming aware of the importance of innovation. The rapid development of the economy and increasingly high competition barriers have forced SIEs to change for surviving and to be better to compete. Competing with domestic enterprises has been difficult, the competition with foreign enterprises to join the global supply chain has brought more obstacles for MEs. However, many Vietnamese MEs have achieved successes through their innovation applying and deeper participation in the global supply chain such as Manutronics Vietnam Joint Stock Company or Hung Dung Company Limited. With major capital and technology constraints, the innovation will be the optimal solution for Vietnamese MEs in SIs to achieve their goals in the coming years.

ABBREVIATIONS AND ACRONYMS

ASEAN Free Trade Area	**AFTA**
ASEAN Trade in Goods Agreement	**ATIGA**
Asia Pacific	**APAC**
Association of Southeast Asian Nations	**ASEAN**
European Union	**EU**
Large-sized enterprises	**LEs**
Medium-sized enterprises	**MEs**
Multinational corporations	**MNCs**
Small and Medium-sized enterprises	**SMEs**
Small-sized enterprises	**SEs**
Supporting industries	**SIs**
Transnational Corporation	**TNCs**
Trans-Pacific Partnership Agreement	**TPP**
Vietnam Automobile Manufacturers Association	**VAMA**
World Trade Organization	**WTO**
ASEAN Member States	**AMS**
Research and Development	**R&D**
Global value chain	**GVC**
Micro, Small and Medium-sized Enterprises	**MSME**
Vietnam Enterprises	**VEs**
Supporting industrial enterprises	**SIEs**
Foreign Direct Investment	**FDI**
Japan External Trade Organization	**JETRO**
Vietnam Chamber of Commerce and Industry	**VCCI**
Value-Added Tax	**VAT**
Purchase order	**PO**
Lead time	**L/T**
Global supply chain	**GSC**
Multinational companies	**MNC**
Small and Medium enterprises	**SMEs**
Vietnam Dong	**VND**

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