



Asian Supply Chain from Perspective of Human Resource Development～Vietnam～ Mekon Supply Chain Study Country Report

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Mekon Supply Chain Study Country Report~ Vietnam ~ Asian Supply Chain from Perspective of Human Resource Development

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1. Introduction

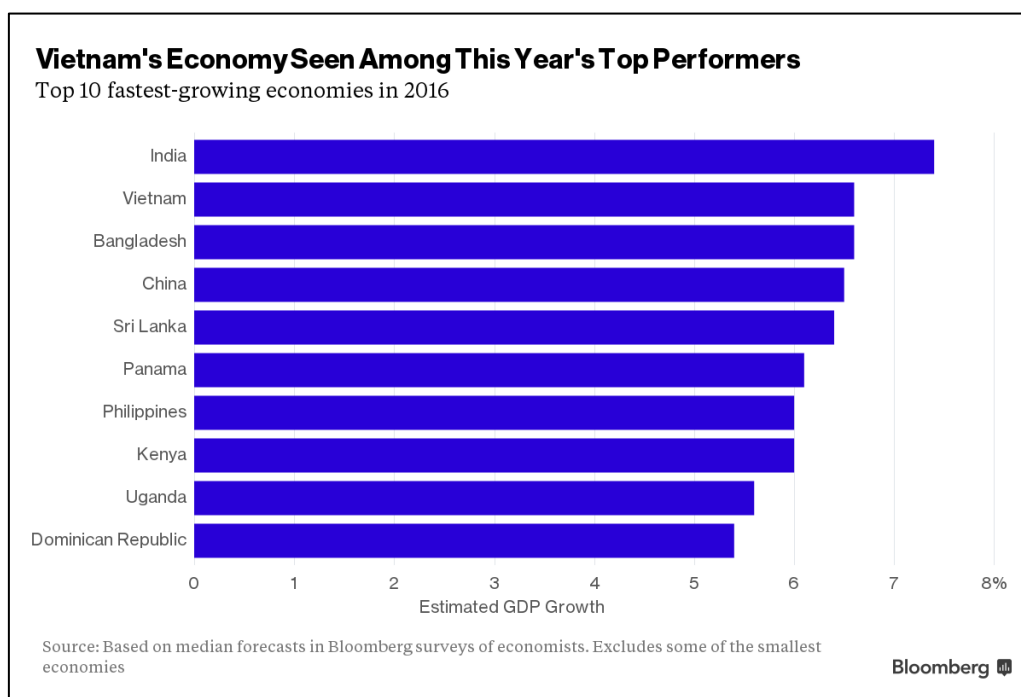
The main objective of this report is to identify the current status of and future challenges for supply chain development in Vietnam, especially from the perspective of human resource development in mechanical industry in Vietnam. This study examines overview of Vietnamese economic situation, business and investment climate, investment and trade policies and logistics and infrastructures since these are the basics for enabling environment of businesses particularly for the manufacturing ones. This study also assesses challenges and issues to be considered for foreign investors not only physical infrastructure like electric power, ports, roads and lands but also other soft infrastructure like human resource development particularly management capability and skill level of local workers, technology advancement and quality management of local businesses which are very important to make entry decisions for the foreign investors. Moreover, mainly success and failure of supply chain are considered from human resource development perspective in mechanical industry, so that current situation of mechanical supporting industries and their human resource are focused to present. In addition, case studies of suppliers in machinery industry in Vietnam are also provided to demonstrate development activities of their human resource and technological capabilities in relations with assemblers in supporting industry in Vietnam. Finally, several recommendations for supply chain development, focusing on human resource development are given to optimize supply chains and facilitate manufacturing in Southeast Asia that is the most important investment destination and market for firms to be competitive at the global stage in the coming decades.

2. Overview of Vietnam economy

2.1 General economy

While the world's largest emerging economies including Russia, Brazil and China falter, Vietnam's steady economic growth at near 7 percent this year will make it among the fastest-growing markets in the world (Figure 1). Rising domestic demand and booming foreign direct investment are helping the Southeast Asian nation counter global threats that's sparked a wave of stock selling and currency depreciation this year.

Figure 1. Vietnam's economy seen among this year's top performers



Source: Bloomberg, 2015

Vietnam's GDP has recovered in these years (Figure 2). The draft of the new Five-Year Plan shows the government aiming to lift gross domestic product per capita to \$3,200 to \$3,500 by 2020 compared with the International Monetary Fund's estimate of about \$2,171 in 2015. Inflation will be kept below 5 percent and the budget deficit capped at 4 percent of GDP.

Figure 2. Vietnam's Growth Recovering to levels seen before global crisis

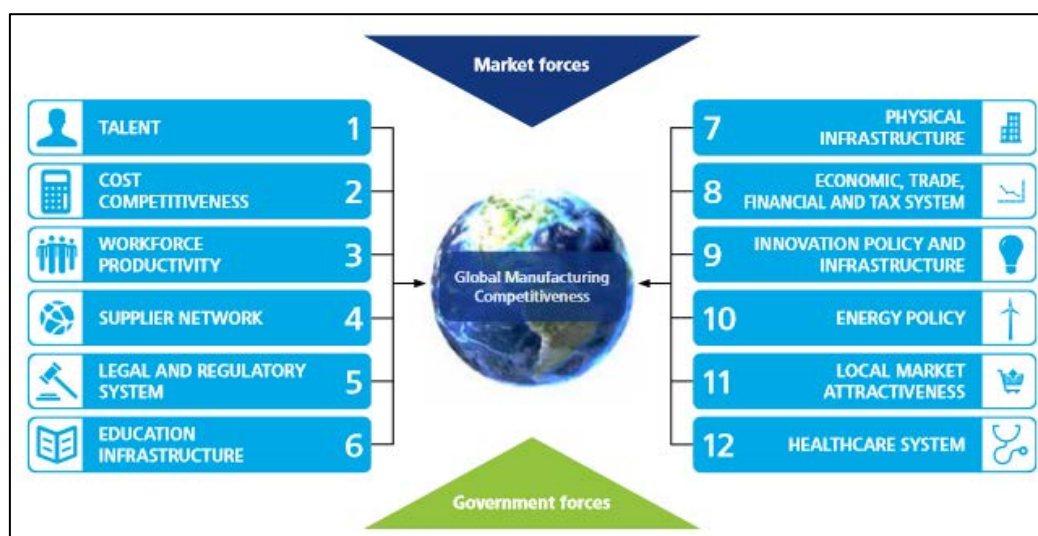


Source: WorldBank, 2015

2.2 Manufacturing industries

In terms of current status within the Asia supply chain, a report of 2016 Global Manufacturing Competitiveness Index, a collaboration between Deloitte Touche Tohmatsu Limited (Deloitte) and The U.S. Council on Competitiveness (Council), which gathered data from CEOs and senior manufacturing leaders (more than 550) in 2016, is part of a multi-year initiative to better understand the trends creating a hyper-competitive global manufacturing environment (Figure 3). Manufacturing today includes all facets of research, development, production, sales, distribution, logistics, customer service, marketing, and support. It extends from the making of physical products to the delivery of services. Properly understanding the breadth of manufacturing is essential to enacting policies to improve standards of living and be more competitive in the long term.

Figure 3. Global CEO survey: Drivers of global manufacturing competitiveness



Source: Deloitte Touche Tohmatsu Limited and US Council on Competitiveness, 2016 Global Manufacturing Competitiveness Index.

Boasting comparatively low overall labor costs, Vietnam has long been seen as an alternative to China when it comes to low-cost manufacturing. Additionally, Vietnam has raised its overall productivity over the last 10 years, growing 49 percent during the period, outpacing other nations like Thailand and Malaysia. Such productivity has prompted manufacturers to construct billion-dollar manufacturing complexes in the country. However, Vietnam's manufacturing capacity does not come close to matching China's at the moment.

When viewed as a group, the MITI-V nations ("Mighty 5": Malaysia, India, Thailand, Indonesia, and Vietnam) can be seen as offering an attractive option for market and economic growth as well as growing customer base for manufacturers (see Table 3).

Other advantages that the MITI-V nations represent for global manufacturers include: (1) numerous tax incentives in the form of tax holidays ranging from three to 10 years, (2) tax exemptions or reduced import duties, and (3) reduced duties on capital goods and raw materials used in export-oriented production. As the manufacturing sector already significantly contributes to the overall GDP of each MITI-V nation, this emerging cluster may well represent a compelling alternative to China and the dissolving BRIC bloc to which it once belonged.

The timing and extent to which China's labor costs rise going forward will drive how

rapidly global manufacturers seek out a MITI-V solution. This shift will also be dictated by the extent to which MITI-V countries can fully harness the talent and productivity of their workforce, invest in required infrastructure, and establish positive regulatory policies to support the manufacturing sector.

According to Industrial development report in 2016, it can be seen indicators of industrial performance by economy, 2008 and 2013 (Table 1). In this table, share of manufacturing value added in GDP from Vietnam is 23.0% in 2013, higher than Philippines and Cambodia, but lower than the others in Southeast Asian nations.

Table 1. Indicators of industrial performance by economy, 2008 - 2013

Country	MVA per capita (2005 \$)		Manufactured exports per capita (current \$)		Medium- and high-tech MVA share in total manufacturing (percent)		Share of MVA in GDP (percent)		Medium- and high-tech manufactured exports share in total manufactured exports (percent)		Manufactured exports share in total exports (percent)		Impact of a country on world MVA (percent)		Impact of a country on world manufactures trade (percent)	
	2008	2013	2008	2013	2008	2013	2008	2013	2008	2013	2008	2013	2008	2013	2008	2013
Singapore	7,921.9	9,700.0	32,535.6	32,285.9	88.0	81.2	25	26	66.7	69.0	89.8	89.8	0.00	0.58	0.01	1.52
Cambodia	106.0	146.8	235.0	428.6	0.3	0.3	18	21	3.4	11.3	75.2	70.2	0.00	0.03	0.00	0.05
Thailand	1,079.7	1,168.4	2,253.1	2,998.6	46.3	40.7	36	34	60.4	59.8	84.8	88.0	0.01	0.87	0.01	1.58
Indonesia	379.5	451.3	353.9	438.8	39.5	37.7	26	25	29.5	30.3	60.5	60.1	0.01	1.25	0.01	0.86
Malaysia	1,616.6	1,717.0	5,148.3	6,201.9	43.1	42.1	26	25	57.9	58.4	70.7	80.7	0.01	0.57	0.01	1.45
Philippines	308.5	353.4	500.0	495.6	35.0	41.5	23	22	77.6	68.6	92.1	90.3	0.00	0.39	0.00	0.38
Viet Nam	173.6	235.6	423.1	1,128.9	25.7	29.8	22	23	25.8	47.4	59.0	78.4	0.00	0.24	0.00	0.82

Source: Industrial Development Report, 2016

Among other Asian countries (excluding least developed countries), most countries maintained their rankings (Table 1). Viet Nam has improved its ranking by an impressive eight places. Its growth is supported by manufactured exports from mainly foreign companies alongside technological upgrading of its industries, a result of government policy to overhaul the financial system and encourage foreign investment. The advanced in all pillars except for a minor decline in medium- and high-tech share in industry. It edged up one place to 50 among 142 countries in 2013. Viet Nam's Manufacturing Value Added (MVA) per capita growth has been impressive and shows its capacity to add value in the manufacturing process. MVA per capita skyrocketed from US\$ 31 to US\$ 235.6 in 2013 (Table 2).

Table 2. Industrial competitiveness ranking and selected indicators for countries and world ranking comparison, 2013

■ Top quintile

■ Upper middle quintile

■ Middle quintile

■ Lower middle quintile

■ Bottom quintile

Group ranking 2013	World ranking		Country	MVA per capita (2005 \$) 2013	Manufactured exports per capita (current \$) 2013	Impact of a country on world MVA (percent) 2013	Impact of a country on world manufactures trade (percent) 2013
	2010	2013					
Industrialized countries							
6	5	7	Singapore	9,700.0	32,285.9	0.6	1.5
21	23	24	Malaysia	1,717.0	6,201.9	0.6	1.5
emerging industrial countries							
1	8	5	China	1,142.6	1,540.5	17.5	16.8
4	25	26	Thailand	1,168.4	2,998.6	0.9	1.6
12	41	42	Indonesia	451.3	438.8	1.3	0.9
other industrial countries (excluding least developed countries)							
1	58	50	Viet Nam	235.6	1,128.9	0.2	0.8
2	54	53	Philippines	353.4	495.6	0.4	0.4

Note: MVA is manufacturing value added. Red represents a fall in the rankings from 2010, green is a rise. Selected countries belong to the category "Other developing countries" based on Annex B1, Table B1.2.

Source: UNIDO elaboration based on Competitive Industrial Performance index database (UNIDO 2015a).

Source: Industrial Development Report, 2016

Manufactured exports per capita growth in Viet Nam over the last decade has been impressive, even outshining China's growth for the period 2000-2010 (Table 3). This shows the country's capacity to meet global demand for manufactured goods in a highly competitive and changing environment. The most impressive fact is that Viet Nam's manufactured exports growth seems to have been unaffected by the recent financial crisis. Other countries like China, India or Cambodia saw a major slowdown in manufactured trade with the US and EU markets.

Table 3. Supplemental analysis: Malaysia, India, Thailand, Indonesia, and Vietnam compared to China

Country	Consumption expenditure (as % of GDP), 2014	Real GDP growth (2011-2015)	Manufacturing exports as % of total merchandise exports, 2014	Share of 15-39 year olds in total population (%), 2014	Researches per million inhabitants*	Legal and regulatory risk (out of 100)**	Infrastructure rating (out of 10)**
Malaysia	50%	5.3%	62%	44%	1,794	41	7.0
India	60%	6.1%	55%	42%	157	60	4.6
Thailand	52%	2.9%	73%	36%	543	55	5.8
Indonesia	57%	5.5%	40%	41%	90	70	5.0
Vietnam	66%	5.9%	72%	43%	114	56	4.9
China	37%	7.8%	94%	37%	1,089	58	6.0

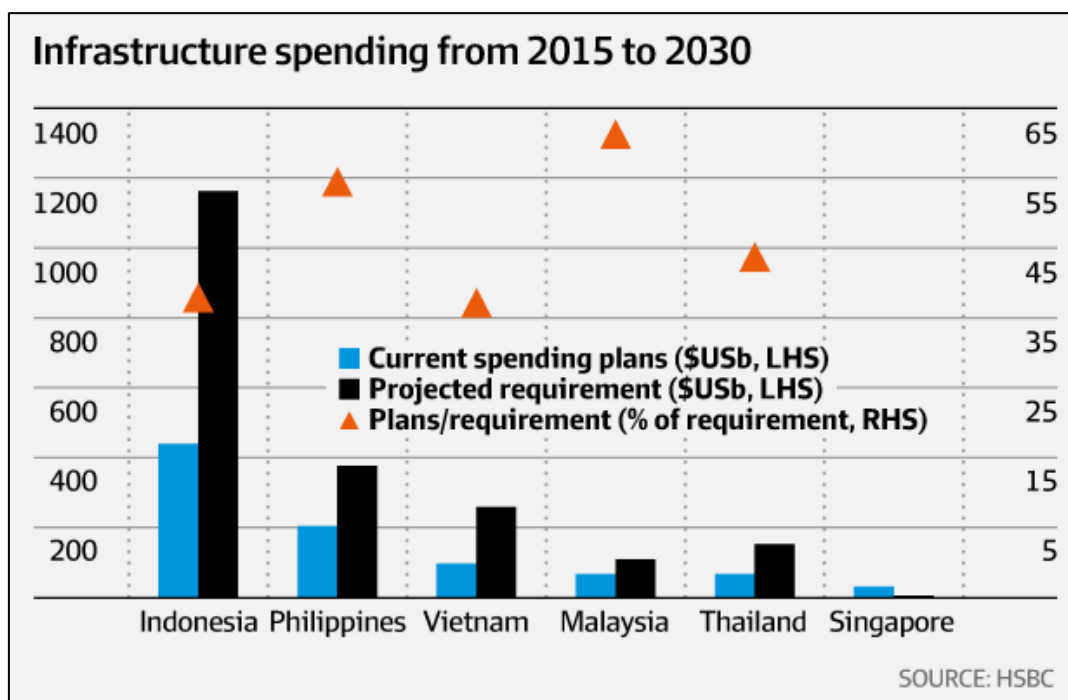
*2013 or latest available year
**Average rating (2011-2015)

Source: Deloitte analysis based on data from EU, UNCTAD, and World Bank, 2016

2.3 Infrastructure and logistic

Vietnam's infrastructure, despite of investments and improvements, is poor and presents considerable obstacles to automotive supply chain operations (Figure 4).

Figure 4. Infrastructure spending from 2015 to 2030



Source: HSBC, 2016

According to HSBC, Vietnam is the only major ASEAN country now meeting a rough rule of thumb that developing countries need to spend five per cent of GDP on infrastructure. The benefits of this are being shown in the way Vietnam has the region's fastest growth rates and is the only country gaining export market share in recent months.

Though until now, Vietnam has no major expressways and only 26 percent of the national highways have two or more lanes. Only 10 percent of the capital city Hanoi is developed for roads, while in most global capitals, 25 to 30 percent is typically dedicated to vehicular traffic. Other significant road infrastructure restrictions:

Vietnam's road system consists of 210,447Km of roads, of which only 3,211 Km are urban roads; Majority of roads are narrow and of low quality

Parking is scarce in urban areas. Hanoi and Ho Chi Minh City have acute shortages of space.

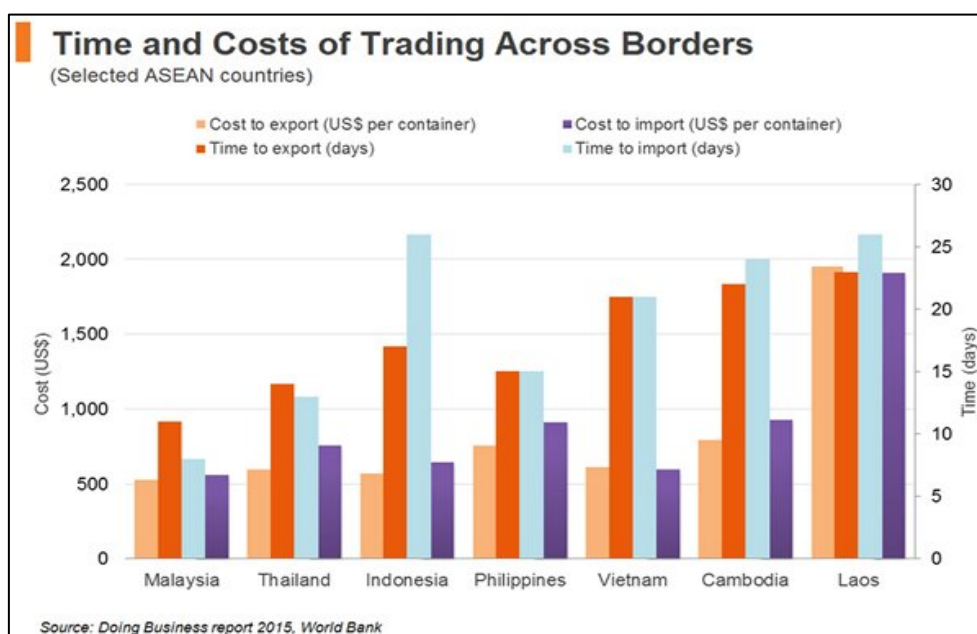
In recent years, Vietnam's northern centres - notably Hanoi, Haiphong and the Bac Ninh province - have become popular production bases for several Japanese and South Korean manufacturers, including Samsung, Panasonic and Bridgestone. A combination of a variety of tax incentives and lower labour costs than in the south have made the northern provinces more attractive to foreign manufacturers, as well as their associated suppliers and supporting industries. In turn, this has boosted the export of finished products and the import of parts and components. According to a survey conducted by the Japan External Trade Organisation (JETRO), the localisation rate of Japanese enterprises in Vietnam was 32% in 2013, markedly lower than the respective rates of China (64%) and Thailand (53%). As a result, many of these parts and components, such as chargers and USB cables, have to be imported from other Asian countries, including China and South Korea (HKTDC, 2015).

In order to capitalise on the rapid industrial growth in northern Vietnam, many foreign logistics services providers are strengthening their presence in the region. However, Vietnam's Logistics Sector still has a lot of major challenges:

- Lengthy Customs Processes: According to a number of local and foreign logistics companies interviewed during a recent HKTDC Research trip to Vietnam, the country's customs and regulatory practices act to increase the operational costs of many logistics companies servicing the region. Although Vietnam's customs

procedures are currently being modernised– a new electronic customs clearance system (‘e Customs’) was launched in April 2014 – delays are still common. These have largely been attributed to a number of inefficient, manual customs processes, including cargo inspections that have attracted criticism for lacking in both transparency and consistency. According to a number of leading logistics companies, Vietnam’s customs requirements are more stringent and cumbersome than those in many other Asian countries. Its customs practices are also seen as unpredictable and bureaucratic. It takes, for example, 21 days to export a cargo shipment from Vietnam, compared to 14 days for Thailand and 11 days for Malaysia.

Figure 5. Time and Costs of Trading Across Borders

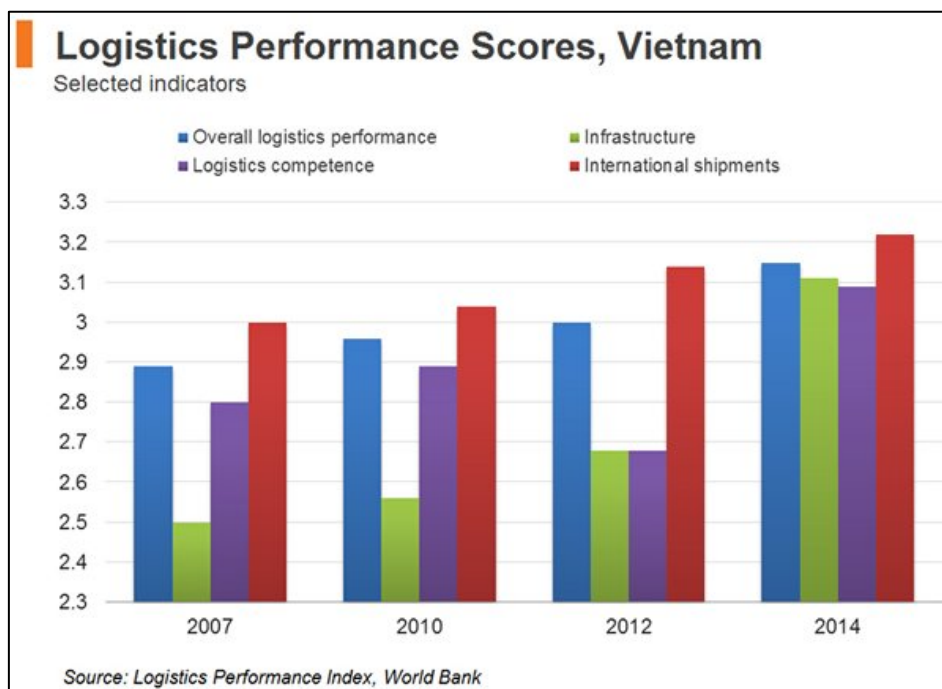


Source: WorldBank, 2015

- **Inadequacy of Transport Infrastructure:** Both local and foreign logistics companies often cite its relatively underdeveloped transport infrastructure as a major challenge for business development in Vietnam. In particular, logistics facilities, such as warehouses and container freight stations, are not user-friendly, as they are often standalone and located far from either ports or manufacturing plants. Congestion is another major problem, causing delivery delays that increase transportation costs. As of June 2014, there were about 290 industrial parks in Vietnam, 33 of which had been operating for just over three years. The fast growth of the number of industrial parks has outpaced infrastructural development. In particular, many of the highways

linking the ports with industrial parks or city centres, as well as the port terminals, are highly congested. The problem is most severe in the Northern provinces, where the infrastructure is less developed when compared with the south. Traffic and port congestion often leads to delays in transporting cargo from the factories to ocean carriers and can impede the delivery of imported parts and components, resulting in higher inventory carrying costs for manufacturers.

Figure 6. Time and Costs of Trading Across Borders



Source: WorldBank, 2015

In the World Bank's Logistics Performance Index (LPI) 2014, Vietnam ranked 48th among 160 countries, an improvement on its previous ranking of 53rd for the past three LPIs. LPI is based on a worldwide survey of logistics operators, including global freight forwarders and express carriers, who provide feedback on the logistics environment of the countries in which they operate and those with which they trade. From a regional perspective, Vietnam was ranked fourth among ASEAN members, lagging behind Singapore, Malaysia and Thailand, while outperforming Cambodia, Laos and Myanmar. As reflected in the LPI indicator scores, Vietnam's logistics performance has been improving steadily since 2007 in terms of infrastructure, ease of arranging international shipments and the logistics competence of service providers.

2.4 Telecommunications

Communications in Vietnam include the use of telephones, radio, television and Internet. There are some key development analysts of aspects of the Vietnam's telecoms sector (Budde, 2015):

- Vietnam's broadband market is growing strongly, on the back of the mobile broadband sector;
- The mobile market had reached 147% penetration milestone coming into 2016;
- The fixed-line market continues to be in decline, having dropped by 70% from its 2009 peak;
- Vietnam's second satellite, Vinasat-2, has been launched;
- MobiFone, having been hived off from VNPT, by 2015 was being prepared for an IPO;
- A revamped VNPT-Vinaphone operation was formally launched in August 2015;
- In 2015 the MIC was preparing for 4G, but the licensing process was not expected until 2016;
- Fibre-based broadband subscribers were growing at an annual rate of 100%+ into 2015;
- Samsung became the largest foreign investor in Viet Nam when it launched its project for a US\$3 billion telephone handset manufacturing and assembling plant;
- The MIC has set 2017 as the target date for introducing Mobile Number Portability (MNP).
- In 2015 Vietnam's FPT became the first 100% foreign-owned company to secure a fixed-line services licence in Myanmar.
- Telephone density is approximately 42% and mobile telecommunications serves as the primary growth agent. As the use of mobile communication devices continues to increase rapidly, telephone density will grow and will remain one of the highest density figures in the world. While use of the Internet is low, every year, several million people in urban areas gain access and Internet Service Providers have ambitious expansion plans that, include broadband development.

2.5 Labor Market

Vietnam's population was estimated at 95.26 million in July 2016, an annual growth rate of 1.1 percent (Worldmeters, 2016; IndexMundi, 2016). More than 40.53 percent of the population is under 25 years of age and 45.22 percent of the population is between 25 – 54 years of age.

As a survey results of the International Labour Organization (ILO) in 2015, the percentage of trained labor in Vietnam is still very low (only 38.5%) and the quality of Vietnam's labor has been limited (if taking a scale of 10, it was only 3.79 points Vietnam). Low labor productivity (only 1/15 – 1/5 – 2/5 compared to Singapore, Malaysia and Thailand). Labor structure unreasonable, many university degrees but direct technical level less (1 university with 0.35 colleges, 0.65 intermediate and 0.4 primary level).

Vietnamese employees work a maximum of 48-hours per week and have fewer holidays compared with China and other ASEAN countries. However, a number of businesses, including foreign direct investment companies, are being encouraged by the government to adopt a 40-hour week. In the long term, Vietnam may lose its cost advantage in terms of longer working hours.

Yet, labor costs are still relatively low compared with other countries in Asia, including China (Table 4). Vietnam's current monthly minimum wage of US\$96-138 compares to minimums of US\$121.90 in Cambodia, US\$135.43- 296.96 in China and US\$265.68 in Thailand. Considering these figures, it is apparent that Vietnam will remain wage-competitive. However, costs in Vietnam are not all wage-related; according to the American Chamber of Commerce Vietnam, if minimum wages were to increase by 15 percent, actual labor costs would be expected to increase by 20-25 percent. These changes will heavily affect retail companies, where labor cost accounts for 25% or more of total costs. The increases will have minimal effect on electronics manufacturers, whose workers are usually paid above minimum wage.

Table 4. Vietnam's wages compared with other Asian countries

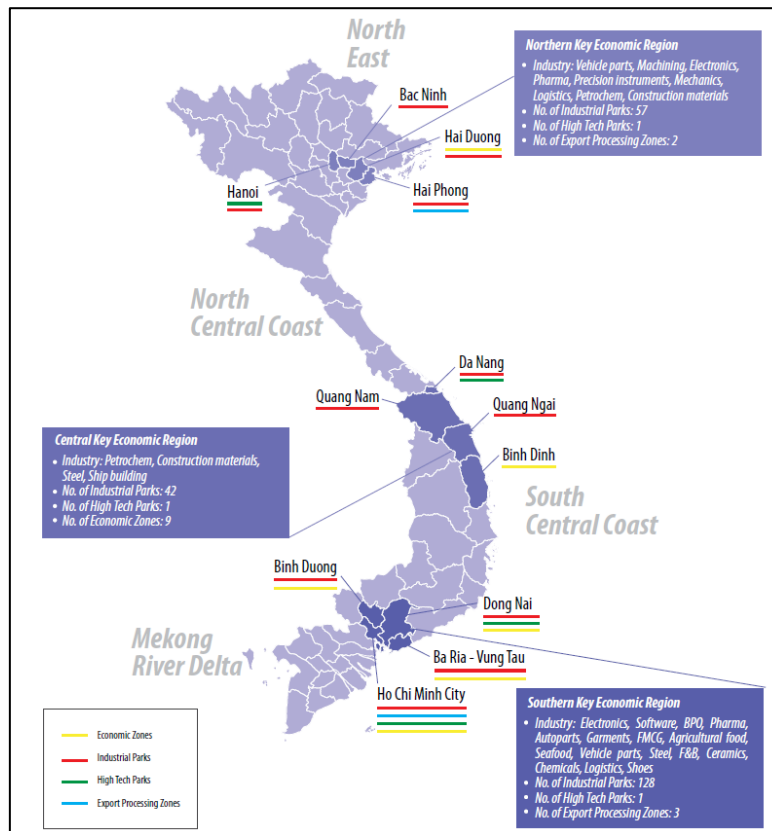
Comparison between China Wages with other Asian Countries			
Country	Annual Minimum Wage (US \$)	Adjusted for Employer Social Insurance Contributions (US \$)	% Difference Against China
China	2,472	3,337	100%
India	689	740	22%
Indonesia	1,087	1,187	36%
Malaysia	3,107	3,534	106%
Philippines	1,515	1,648	49%
Thailand	3,012	3,169	95%
Vietnam	1,296	1,581	47%

Source: Chris et al., 2014

Vietnam has dual minimum wage policies: one for local Vietnamese enterprises and the other for foreign-investing enterprises. By decree 153/2016/ND-CP dated 14/11/2016, the Vietnamese government has decided to raise the minimum wage by up to 13 percent. The amount is said to be able to help workers cover 80 percent of their basic demands. Starting January 2017 the monthly minimum wage, will be between VND2.58 million and VND3.75 million (US\$107-156), depending on regions. Ministry of Labour, Invalids and Social Affairs - MOLISA). MOLISA's "Minimum Wage Adjustment Road Map" to 2020 suggests that the minimum wage in 2020 will be around VND 4.8 million (US\$213) in Region One and VND 3.4 million (US\$151) in Region Four. Vietnam has a four-tiered minimum wage scheme based on location. Region One, which includes Hanoi, Hai Phong and Ho Chi Minh City, has the highest minimum wage. Region Four, including the least developed parts of Vietnam, has the lowest.

Apart from rising labor costs, a shortage of engineers is common in all emerging Asian countries. Vietnam is no exception. Thailand faces the most critical shortage, due to the rising trend of major automotive companies establishing R&D operations in the country.

Figure 7. Vietnam's Key Economic Regions



Source: Briefing, 2014

Employees in the business sector

The growth in the number of businesses has created many jobs for laborers. Number of employees in the business sector has increased 1.7 times in 2007-2015, from 7.2 million to 12.8 million with an average growth rate of about 7.4% / year, with a half the growth in the number of enterprises in the same period. The average growth rate of labor is lower than that of the number of enterprises, which will lead to the fact that the newly established enterprises will have grown smaller scale.

Like the growth in the number of enterprises, the growth of employment in the enterprise also is divided into 2 phases. If the period 2007-2011 witnessed a strong growth in the number of workers, with about 11.8% / year, then to the 2012-2015 period, growth in the number of employees has dropped sharply, only about 4.1% / year, especially during the 2012 when the number of employees increased by only 1.7%. This means the number of new jobs created in the past four years has decreased significantly. In 2015 the number of employees rose by 5.9%, but still well below the average of 2007-

2011, but were higher than the three years 2012-2014. In the 2012-2015 period, employment growth rate of FDI is improving rapidly and significantly increased compared to the non-state sector (11.1% / year compared 2.9% / year). Meanwhile, as is in the process of restructuring and equitization, workers in the state-owned sector has declined over the 2012-2015 period (VCCI, 2015).

The average size of enterprises during 2007-2015

Period 2007-2015 witnessed a considerable growth in the number of enterprises, number of employees and total capital. However, the growth rate of these 3 different factors are leading to a change in the size of the business in terms of labor and funding criteria. The number of firms increase faster than the number of employees, leading to the shrinking size of the business over labor. Average employment in the enterprise has been reduced from 49 employees in 2007 to only 29 employees in 2015, corresponding to the size of a small business. This is consistent with the fact that the proportion of micro and small enterprises in the economy are increasing so that a lack of medium-sized businesses have become available in Vietnam.

The decline in the average employee size of the business comes primarily from the decline in the average size of the non-state enterprises, while the average size of SOEs and FDI is relatively stable. The average employee size of non-state enterprises has been reduced from 27 employees in 2007 to 18 employees in 2015. The size of the average employees of state enterprises decreased from 505 workers in 2007 to also 491 employees in 2015, while the labor scale of FDI also fell slightly from 340 to 324 labor workers. Thus, if the average size of SOEs and FDI corresponds to a large enterprise, the scale of the only non-state enterprises corresponds to small businesses. It should be noted that the number of state-owned enterprises in this period has been significantly reduced.

If a more detailed review of labor scale of the enterprise in every business type by type of ownership in 2014, we could see as many as 99% of microenterprises are non-state enterprises. Proportion of non-state enterprises also accounted for 93.7% of the small-scale enterprises (VCCI, 2015).

Table 5. Distribution of firms in terms of labor and ownership in 2014

			Ownership types			Total
			State firms	Non-state firms	FDI	
Firm size	Micro	Number (firms)	104	284.619	2.872	287.595
		Rate in row (%)	0.04	98.97	1.00	71,50
		Rate in column (%)	3.43	73.32	26.00	
	Small	Number (firms)	1.211	92.771	5.021	99.003
		Rate in row (%)	1.22	93.71	5.07	24,61
		Rate in column (%)	39.94	23.90	45.46	
	Medium	Number (firms)	458	5.938	934	7.330
		Rate in row (%)	6.25	81.01	12.74	1,82
		Rate in column (%)	15.11	1.53	8.46	
	Large	Number (firms)	1.259	4.845	2.219	8.323
		Rate in row (%)	15.13	58.21	26.66	2,07
		Rate in column (%)	41.52	1.25	20.09	
Tổng cộng		Number (DN)	3.032	388.173	11.046	402.251
		Rate (%)	0.75	96.50	2.75	100.00

Source: VCCI (2015)

Thus it can be seen that the micro and small enterprises are non-state enterprises. This is notable for policy makers to support micro and small enterprises, which have not been received an adequate attention in recent years and shows the need for legislation to support small and medium-sized firms. State enterprises are mainly large-sized (41.5%) and small (39.9%), while FDI is mainly small-scale (45.5%), followed by is micro size (26%) and large (20.1%). Thus it is possible that medium sized firms account for a small share in all 3 types of businesses. In total, in 2014 71.5% are micro-scale enterprise, 24.61% are small enterprises, 1.82% medium-sized enterprises and 2.07% are large scale enterprises (VCCI, 2015).

Efficiency of using labor by enterprises period 2007-2014

If labor is considered one of the inputs of production and business activities of enterprises, the relationship between turnover by employees of businesses and their income will reflect the efficiency of labor. By this criterion, we can see the labor efficiency in the period 2007-2014 has not only not improved but also decreased, from 17.3 times in 2007

to 15.4 times in 2014.

The non-state enterprise sector is performing the best in terms of labor productivity in 2007-2011, but by the year 2012- 2014 the state-owned enterprises have been the best. Only state firm's labor productivity tends to increase during the period 2007-2014, especially in 2012-2014, while the others are likely downward. The non-state enterprises began to decline in labor productivity since 2009, coincided with the impact of the world financial crisis. This decline continues by 2012 before starting to recover slightly in 2013 but then fell in 2014. Meanwhile, the FDI sector always has the lowest efficiency and tend to decrease. The decline in labor efficiency of FDI stems from the growth rate of wages of workers that was higher than the growth rate of average revenue. With rising living standards, the Government has continuously enacted policies to increase the minimum wage in the enterprise that have forced enterprises to raise wages for workers, this is beneficial for employees action, but will reduce one of the advantages to attract foreign investment in Vietnam. Another factor is that although wages have increased, but the quality of labor Vietnam has not increased accordingly (VCCI, 2015).

A survey by the Institute of Labour Science and Social Affairs and Manpower Group in 6000 enterprises of economic sectors in the 9 provinces in Vietnam showed that businesses assess the quality of Vietnam's labor is 10% of the lowest among the ASEAN region. Survey results also showed that 1/4, 1/5 of businesses said that labors are a lack of understanding of technology and creativity, the ability to adapt to new technologies, respectively. Up to 1/3 of enterprises did not find workers with the skills they need (Goran & Nguyen, 2011). This result is almost identical with the results of the survey of 350 companies carried out by the World Bank and the Central Institute for Economic Management Central as most companies surveyed were not satisfied with the quality of education and skills of workers, particularly engineers and technicians. Not only the lack of professional knowledge, but also on problem-solving skills, leadership and communication. With such a situation, the advantage of low labor cost in Vietnam is losing attractiveness for foreign investors (VCCI, 2015).

2.6 Investment Environment

For years, South East Asia (ASEAN) is considered as promising markets for investors since the ASEAN countries are increasing as the target of the investment. Among ASEAN countries, Vietnam with cheap labor market and stable politics and high economic growth brings a unique competitive advantage.

Advantages

Firstly, Vietnam has stable politics in many years because Vietnam is a one-party state run by the Communist Party Secretary-General, the Prime Minister and the President. By a unique leadership party, Vietnam can maintain political stability more effectively than other countries in the region, such as Thai land, which often has political disputes. Therefore, the production or operation of companies may not be interrupted or affected negatively by them.

Secondly, Vietnam is making efforts to improve its investment climate. In Vietnam, foreign and domestic investors are fairly treated when Government applies a unique Law on Investment for both of them. It is one of many reasons that United Nations Conference on Trade and Development (UNCTAD, 2011) ranked Vietnam among the top of the fifteenth attractive economies for foreign investors. Following the Vietnamese Law of Investment and Decree on Business registration, it has one-stop-shop in each provincial Departments of Planning and Investment where are authorized to handle the related issues of receiving, reviewing, returning the application of registered business and investment certification.

- The investors to get investment certificate within 15 working days (for the documents are correctly fulfilled) even they invest in any Industrial Park in Vietnam. Almost Industrial Park Management Company will support them to process this legal procedure. The investors will not worry so much for this issue.
- Moreover, Vietnam Government also has some specific investment incentives for foreign investors, such as tax, land lease, in some sectors, especially for high tech manufacturing industry. According to Decree No.218/2013/ND-CP guiding the implementation of Law on the Corporate Income Tax, the standard CIT rate is reduced from 25% to 22% in 2014, and further reduced to 20% from 2016. However, it does not mean that these tax incentives will be adapted for all Industrial Parks. It is limited for some Industrial Parks, which satisfied the conditions of these incentives such as the case of Kizuna JV Corporation. Even they have 2 projects in different provinces. One project is in Long An Province (Kizuna rental serviced factory) and the other one is in Ho Chi Minh City (Eco Factory), the investors can get tax incentives with 0% for first 2 years and 50% for next 4 years in both 2 projects of Kizuna JV Corporation.

Finally, the high probability for Trans-Pacific Partnership (TPP) signing in 2015 will bring great opportunities to Vietnam, unlocking the markets and connecting the economy of Vietnam to other members. And by this case many foreign investors are

moving to Vietnam to get this benefits from TPP

Disadvantages

Vietnam also has some weaknesses that a company should be cautious when it starts doing business in Vietnam. It was claimed that Vietnamese legal systems are insufficient, lack guidance and coherence. Therefore, it may increase cost of the companies because time is value for any companies. Therefore, having consultations with government agencies is necessary to comply with regulations.

In the manufacturing industry, with the lower cost of labor force, a company could take an advantage of a lower price. Moreover, the labor force in Vietnam is fairly well-educated, with a literacy rate of 90%. This brings competitiveness to Vietnamese worker's environment because the enterprises can not only use well-trained labors but also reduce the production cost (labor cost). According to statistics of Vietnam Foreign Investment Agency, a large number of the FDI companies are doing in the manufacturing industry in Vietnam in order to take competitive advantage of cheap labor force in Vietnam. In fact, many branded companies, such as Samsung, Toyota, and Intel already invested in Vietnam in order to use cheap labor to reduce cost of manufacturing.

Despite impressive economic growth in current years, Vietnam still has a problem pertaining to infrastructure. Actually, the infrastructure in Vietnam is underdeveloped and it is still in the process of upgrading and developing. Infrastructure in Vietnam is inadequate and leads to some difficulties in operating business, such as transportation.

Although infrastructure in some big cities, such as Ha Noi, Ho Chi Minh and Da Nang, has been vastly changed and modernized, it is still unequal to infrastructure development in rural areas. The outages of electricity or water stoppages are popular because the development of power sector does not keep up with the growth of power demand (World Bank, 2009).

Blackout is always the concern of companies, especially for those who do manufacturing. The generator is usually used only for the most important phase because not enough power supply for operation and production activities; in addition, the usage of generator can cost approximately six times the usage of grid electricity. Some industrial parks have no power and financial enough to build their own generation, they have to accept this issue. Some Industrial Parks want to improve this status and they built the generation for themselves. However, the investors in these industrial parks can receive benefit from

this activity, but they have to pay electricity bill more expensive than normal EVN price. In some case, with the advantage from the geographic bordering location, some company such as Kizuna JV Corporation can get benefit from the strength of 2 main power sources of Ho Chi Minh City and Long An province to supply electricity 24 hours a day with EVN price. The tenants in Kizuna rental serviced factory will no longer worry about the shortage of power for their production and they also can save cost from electricity bill.

2.7 Vietnam in the global supply chain

The process of trade liberalization and international economic integration brings a lot of opportunities to Vietnam becoming an attractive destination of investment. Vietnam is actively involving in the ASEAN Economic Community (AEC), Economic Partnership Agreement Trans-Pacific (TPP), the FTA with the Union Customs Russia-Belarus-Kazakhstan ... is the key to help Vietnam businesses penetrating in the global supply chain.

For ASEAN markets, the opportunity for Vietnam exporters to ASEAN are greater than ever when the AEC has been established in 2015. Vietnam will have the opportunity to participate in global supply chains not only with ASEAN countries but also with countries that have participated in free trade agreements with ASEAN such as Japan, Korea, China.

The continued rise of global supply chains and the development of the service sector have brought advantages for enterprises. According to the Ministry of Industry and Trade (2015), at an early stage, in a series of products, Vietnam just takes some simple parts, but by the time, it will have the enterprises that invest in the higher value stages as IC manufacturers, chip...

However, according to the Chamber of Commerce and Industry of Vietnam (VCCI), the participation of Vietnamese enterprises in the production chain of global value network is low compared to the economies of similar size in the Southeast Asia region. Specifically, only 36% of Vietnamese enterprises involved in the production network, including direct and indirect exports, while this ratio in Malaysia, Thailand is 60%. This reality shows that supply chain in Vietnam economy are fragmented and less likely to benefit from spillover effects of foreign investment, technology transfer, knowledge transfer and improved productivity.

According to VCCI (2015), the main cause of this situation is due to Vietnam has only

about 4% of large and medium-sized enterprises in the total number of enterprises, so it has lower competitiveness and participants in supply chain; mostly focus on local market.

Another problem, although many MNCs have invested production and trading activities in Vietnam, almost all of domestic enterprises have stood outside their global value chains.

According to a survey report of the CUTS Internationals Company in Vietnam, in total of 68 enterprises involved in the supply chain of Samsung Vietnam company, there are 48 FDI enterprises and only 20 Vietnam enterprises, similar only 2/12 Vietnam enterprises involved in Toyota's supply chain in Vietnam.

At the seminar "Integration of global supply chain for SMEs: Improved access to regional and international markets for Vietnam enterprises" by the American Business Council-ASEAN held (2015), most experts agree that, Vietnam SMEs have many restrictions in participating in global supply chains as competitive position, low ability to participate in assignments international labor, lack of vision and competitive strategies. Therefore, most Vietnam enterprises only at the stage of the lowest participation in the supply chain, they are assemblers or outsourcing.

As reported by the People's Committee of Ho Chi Minh City, only 300 Vietnam enterprises are qualified to join the global supply chain, but most of them also provide spare parts rather than join the main export products. Because, they lack of capital, inability to price competition, lack of qualified human resources, unfamiliar with the complicated procedures, lack of promotional activities.

Besides, according to experts, a weak point of Vietnam enterprises now is the lack of links between them when joining together the supply chain. They have to find a strategy and a position by themselves in the market. Meanwhile, in a supply chain of a product, an enterprise can cooperate with others to specialize each stage of production instead of producing by itself.

In order to participate in global supply chains, enterprises need to look to the high-tech products, large brain content, create high added value, rank high in global supply chains.

In addition, the experts also said that issues such as the limited government support; regional competition from rivals; low infrastructure and logistics industry are also barriers that Vietnamese enterprises have not made full use of the opportunity to participate in the global supply chain.

3. Vietnam human resource in the global supply chain – a case study of Vietnam enterprises in mechanic industry

3.1. Vietnam mechanical enterprises

3.1.1. Vietnam mechanical industry

Mechanic is a key industry of Vietnam. According to the Vietnam Association of Mechanical Industry, at the end of 2015, there are about 3,100 enterprises in total 53,000 mechanical manufacturing units. Approximately 50% of these units are specialized in manufacturing and assembling, others are repair facilities. However, after a long striving period, in general, the domestic mechanical engineering technology is still simple and backward. In 2014, it imported \$ 27 billion of machinery and equipment, while export reached only \$ 15 billion. Mechanical engineering capacity has only met 32.12% of domestic demand.

This situation has come from some important causes:

- Supporting industry of mechanic is dependent on 70% of imported raw materials.

In the whole country 2015, Vietnam has over 300 enterprises producing components and spare parts, but most of them are simple products, low technology; the important accessories such as engines, gearboxes and move have to import 100%. Domestic capacity has not met the demand, annually import machinery and equipment of Vietnam is up to billions USD, domestic mechanical products accounts for only about 7% of the market. For example mechanical supporting industry for the automobile industry, the Department of Heavy Industry (MOIT) said this area is modest development, localization rate for 9 seats cars has still been about 7-10% in comparison with objectives are 40% in 2005, 60% in 2010. Most automotive components are imported, therefore the Vietnam automobile manufacturers incur additional costs such as packaging, shipping and import tax. Total production cost in Vietnam cars is higher than the region, such as Thailand or Indonesia. It leads to automobile mechanics supporting industry has not developed.
- The supporting policies for industrial supporting industry development are not yet strong enough, most local enterprises develop and search market by themselves

Over the years, Vietnam Government has driven for supporting industry, however how to understand and apply is still confuse. According to the Ministry of Science

and Technology (2015), as most of enterprises are lack of capital and equipment, outdated technology, production fragmentation, so even they have the supporting policies, mostly benefit on paper.

- Organizational, management and technology capacities of Vietnam enterprises are very limited, cannot meet the requirements of FDI's cooperation

Surveys in several manufacturing enterprises of mechanical supporting industry, most of them are SMEs with weaknesses in finance, in equipment to ensure product quality and productivity and cannot meet the delivery schedule.

- Lack of information and links between enterprises

Typical evidence that some enterprises imported the supporting industrial equipment from the US, but they used to be Vietnam products. Investors are very lack of data on purchasing power market, the industry growth, the enterprise ability... to connect investors with enterprises. If the connection is good, they can save both time and money.

There have been many workshops, studies to seek the solutions for this problem. Some stands out are:

- Development of mechanic industry in general and supporting industry in particular should be identified as a national strategy, not only enterprise's mission.

Vietnam Association Mechanical Industry said that just being a national strategy, the Government's decisions have strong enough to lift this difficult mechanic industry.

Government should build a strategy development of mechanic industry in the coming period with a number of product and services which need the supporting orientations, such as machinery and equipment for vital industries; machinery, equipment, tools, spare parts for the mining and processing of agricultural products (agricultural products, foodstuffs, seafood, furniture, ...), agricultural robots.

Government policies should be more evident in the support mechanism for the domestic engineering products at projects that are financed by the state; or the State should issue more solutions as financial support and tax policies for imports of equipment or expand eligibility in bidding for public projects.

- Enterprises have to rise up by themselves and accept competition in integration economy.

Invest in new technologies, radically change the outdated management thinking and apply advanced management methods / systems, train human resources... are the specific path to the success of many enterprises.

- Enterprises need to rebuild production models toward becoming the “chain” of global value chain. Many companies have created new ways to be able to gradually participate in the global supply chain. They cooperate together, formulate the chain link patterns to create strengths and diversities of products and types with reasonable prices and high competitiveness.

On the issue of information for businesses and investors, Government / enterprises / associations should set up a website and publish information of imports, quantity and value of import, export in order to enterprises / investors exploit and analyze these data.

3.1.2. Vietnam mechanical supporting industry and four case studies

Vietnam supporting industry

Considered as the backbone of Vietnam industrialization and modernization of process, but the development of Vietnam supporting industries in the recent years has not met the market's demand yet, mostly supporting industrial products are imported. According to statistics of the Ministry of Industry and Trade (2015), import turnover of supporting industrial products in Vietnam reached more than 100 USD per year. This figure has partly reflected the reality of Vietnam supporting industry.

In order to set up the supporting industry, since 2007, the Ministry of Industry (now the Ministry of Industry and Trade) has issued Decision No. 34/2007 / QĐ-BCN of approving the development plan of supporting industry to 2010, toward to 2020. Then in 2011, in Decision No. 12/2011 / QĐ-TTg, the Prime Minister issued development policy for some industries to motivate this field. However, Decision 12 / QĐ-TTg do not clearly define product categories which are priorities and only one enterprise has endowed from it.

In recent years, the failure of supporting industry has main cause from the small domestic market capacity while the foreign assemblers' domination are too big, it makes a lot of difficult for local enterprises to join in the global supply chain. According to the Ministry of Industry and Trade (2014), in total 500 supporting industrial enterprises in the manufacturing sector, only about 200 local ones which are participating to produce for foreign firms but concentrated mainly on the sectors of motorcycles and electronics,

while others such as textiles, footwear, mechanical, automobile ... have left opened.

According to the 2013 report of the Institute of Industrial Strategy, the proportion of domestic components and accessories has only reached 27.8%, while that rate in Thailand has reached 60% and China is 50%. Many areas do not achieve their objectives, namely:

- The automobile industry set a goal 60% of domestic products in 2010-2020, but by 2013, it was only 7% - 8%;
- The textile industry planned to increase the localization rate to 60% in 2015 and 70% in 2020, but by 2013, this sector had still to import 99% cotton, 60% fiber, 70% cotton;
- The mechanics was expected 75% localization in 2020 but until now the domestic mechanical technology is still simple in general.
- The electronic industry reached localization rate nearly 20%, but in fact Vietnam has no electronic industry, just electronic assembly industry.

Characteristic of the supporting industry is that enterprises must invest in specialized machineries, has advanced technology level to participate in the chain link. Therefore, some orientations for Vietnam supporting industry are:

- Develop Vietnam supporting industry need toward the main country industries which attract FDI and have a large demand of supporting industrial products, such as textiles, mechanics and electronics, assembly...;
- Rapidly modernize technology, train high quality labor to soon be able to produce the qualified products;
- Encourage enterprises to invest in this sector by adopting competitive in quality and price according to the international commitments;
- A number of preferences of corporate income tax and the regulations on the construction of supporting industrial clusters to attract the global MNCs to invest in Vietnam;
- Focus on measures to support the technology, production management, customer approach... to overcome the weaknesses of the Vietnam enterprises in supporting industry.
- Solve problems related to the capital and arrange ground for the supporting industrial enterprise;

The Vietnam latest decree of Supporting Industrial Development No. 111/2015 / ND-CP has set out a number of incentives:

- The supporting industrial projects will be exempted from income tax up to 4 years, 50% of the tax payable in maximum 9 next years since the first year of taxable income;
- Personal income tax is also exempted 50% from regular personal income applicable to expert training and technology transfer, maximum in 1 year;
- The SMEs that have supporting industrial projects will enjoy preferential investment credits from the Industrial Investment Fund with an interest rate not exceeding 80% loan rate trade, and the loan term up to 10 years; and can be guaranteed by SMEs credit fund. These projects is also extended tax payment 6 months from the first time under the provisions of the Law on Value Added Tax.

The goal of the national program for supporting industrial development to support Vietnam's supporting industrial products basically meet 45% the domestic demand in 2020 and elevated 60% in 2025.

Mechanical supporting industry

Vietnam's supporting industries are 2-3 generation behind compared to the region. Along with that, a series of issues that are considered "weakness" of Vietnam's supporting industries are obsolete devices through years of use, poor accuracy, lack of spare parts, lack of maintenance, lack of capital for alternative investment, innovation and upgrade. Stage of creating embryonic - a very important part of the engineering industry, the manufacturer is still used mainly by sand mold casting technology, low-quality castings. Vietnam mechanic has been inexperienced in high precision casting, quality and durability. Suture heat and surface treatment quality of mechanical products were weak, affecting negatively the quality of the finished product. Mechanics currently lacks the advanced thermal treatment facility. In supporting industries, the rate of supply of domestic raw materials of some industries such as automotive accounts for 20-30%, leather - shoe, textile - garment over 10%. Mechanical industry capacity can only meet 32.12% of the domestic demand (Ministry of science and technology, 2016). State policy currently stimulates localized products of SI, but the general policy considers the technology is imported mainly in the next 10-15 years.

Surveys in several manufacturers in SI mechanical industry, the majority have said that domestic companies operating in this sector are mostly small and medium enterprises, weak financial capacity, so deficient equipments to ensure production, leading to low productivity, cannot meet the delivery schedule. Besides, the capacity of the organization, management and technology of Vietnam enterprises are very limited, cannot meet the

requirements of business cooperation with FDI.

It can be seen that currently the SI Mechanical sector has been invested spreadly and underdevelopment in comparison with its potential and advantages. Realizing this, over the last time, the government has issued many preferential policies and mechanisms for SI firms of the mechanical industry so that many companies have created new ways to be able to involve in the global supply chain as Vietnam is getting increasingly deeper integration into the world economy. Many companies in the industry have come together to work, forming chain link together to create strength and product diversity of models and types with reasonable prices and high competitiveness. Currently many businesses have applied in the chain link and achieved certain success.

Beside the efforts of the company, the experts also said that the state should issue more solutions to support the industry such as support in capital, tax policy on imported equipment or expand conditions for participation in bidding for public projects.

Three case of suppliers in machinery supporting industry

According to Hoang (2009), there were three case studies of both domestic and foreign suppliers showing different models of development in machinery supporting industries. In all these models, a long relationship with assemblers is key for their development because it enables suppliers to improve technological capabilities, human resource skills...

Supplier A

Supplier A is a member of a Vietnamese state-owned corporation in the machinery industry. The company was established in the 1960s and is still a state-owned company. The main technologies used in supplier A include casting, forging, heating and mechanical procession with high specification tools. Currently, the company has more than 1000 employees. The products of supplier A include cylinders, axe pistons, gears, and shafts. In addition to products for the supporting industry market, the company also has their own completed products, such as gear boxes and some kinds of agricultural machines. However, products for motorcycles account for 80% of the company's total sales. Honda is the main customer of company A, and this supplier also has a subcontracting relationship with other Japanese motorcycle producers. Two years ago the company started receiving orders from overseas customers and is now increasing the portion of its

exported products.

The development of supplier A, especially since 2000, is consistent with the development of foreign corporations invested in Vietnam, particularly Honda. Before 1998, when the company was a small factory, and although it had a labor force with good technological capabilities, it has lower productivity. The main reason was its management system, particularly the fact that its production management was less effective.

Supplier A has significantly improved since the late 1990s, after having a subcontracting system with Japanese companies, and especially after having a contract from Honda. Its subcontracting relationship with Honda includes technology transfer, and production management cooperation. The company gradually adopted and built up its own production system, following the model of Japanese manufacturers. Technologies were transferred through dispatched engineers from Honda. In the early stage of subcontracting, the dispatching time was 2-3 months. Subsequently, when the company had its own technologies, the dispatching time reduced to some days. Since 2002, after the first stage of striving to respond to its customers' requirements, the company has rapidly enlarged its production capacity. The company has oriented itself to foreign markets since 2006.

The development model in supplier A is in the traditional model of firms in developing countries. By participating in a FDI subcontracting system, these firms enhance their technological capabilities and expand internationally. This process starts by improving production technologies, then moving to improve products before they have the capabilities to design and create new products. In Vietnam, numerous suppliers were developed by this model; especially in the industries oriented toward local markets.

Supplier B

Supplier B is a component parts producer in the Honda Group. Its factory in Vietnam was established following the opening of Honda Vietnam in 1997, and the first customer of supplier B was Honda Vietnam. Since then, the company has expanded its market to other Japanese assemblers in Vietnam, but with a small amount of products. Supplier B has developed rapidly since 2002 and has started exporting indirectly, i.e. through the export products of Honda Vietnam. Since 2005 the company has directly exported its products, mainly to Honda's affiliate factories in ASEAN and the United States. The company has had high growth in recent years and the different types of its products have

increased.

The development of supplier B is similar to other typical FDI companies. In the early stage of development, these companies receive production system transfers from headquarters; followed by the accumulation of production related technologies, improved production efficiency, product quality and subsequent move towards exports. Companies supplying component parts for the host country market become global suppliers, providing to corporations worldwide. Some support from the government can be used during this process, particularly in human resource development.

The model of supplier B is typical for suppliers who are in a foreign corporation's group. Along with assemblers, these companies enter the markets of developing economies and build global production bases there. The penetration of this group of suppliers is meaningful not only for building supporting industries for the local needs of host countries, leading host country industries to global production networks, but also in having a spill-over effect to local firms. The significant contribution is through turnover labors and subcontracting with local firms.

Supplier C

The last case study is the model of SME investing in Vietnam and participating in supporting industries in the host country. Factory C in Vietnam, which was established in 2005, is one of some of the company's factories in the world: 2 in China, 1 in Thailand, 1 in Indonesia, 1 in Philippines, 1 in Vietnam, and 1 in America. Supplier C's products are precision functional products, such as valve springs, ABS sensor rings, and wave springs, (automobiles); digitronic products, such as wire springs and multi-forming parts, (electronics); and devices, such as adapters and optical transceivers (communications). Supplier C (in Vietnam) has 370 employees, and its customers are mainly FDI companies in Vietnam (about 80%) and export (about 20%). After a few years operating in Vietnam, the factory runs efficiently.

Regarding Vietnam as good location for building a production base, supplier C concentrated on exploiting the country's low labor cost in its early stage of development; it then focused on building its technological capabilities and worker's skills in particular. According to supplier C's managers, for its long-term development the company needs to have highly skilled labor. To have a good worker, it takes about 7 years at the factory in Indonesia, 4-5 years at the factory in China and about 3 years for workers in Vietnam.

To have highly skilled labor may take the company more than 10 years, but these laborers are critical for sustaining the competitiveness of the company, as well as its capabilities to improve and innovate products.

SMEs in Japan as well as other countries, such as Korea and Taiwan...contribute significantly to supporting industries in Vietnam. SMEs often have limited resources, so they tend to be slower to invest abroad. Only when SMEs consider that the risk for investing in a new destination is not so high will they decide to invest. However, since the number of SMEs is very large, when there are positive signs from an investing environment a considerable amount of them will take that step and invest. Furthermore, the development of SMEs in Vietnam has had a strong effect on building industrial clusters, which can enhance the productive capacity of both FDI and local companies in Vietnam, and attract more FDI.

The trend of SMEs expanding their production systems internationally has been strengthened in recent decades. On the one hand, today's SMEs have more independent technological capabilities and production capacity, so that they are more independent of large corporate production systems. They can have their own products, and participate more in large corporations' new product development. With their own capabilities, they can more easily invest abroad. On the other hand, globalization and the development of global networks push SMEs to invest abroad. The global investment environment is now less risky to SMEs. Supporting industries in developing economies have more chance to host SMEs, such as in the case of supporting industries in the machinery sector of Vietnam.

3.2. Human resource in Vietnam mechanic industry

3.2.1. Vietnam mechanical human resource

According to the Ichi Vietnam, manpower market of the mechanical engineering industry is a lack of supply. A lot of large industrial parks in Hanoi, Binh Duong... are seriously shortage of labors for CNC machine, turning, milling ..., despite recruiting with a high salary and remuneration. Not only the large industrial zones, but also the small industrial zones, or firms need the number of technicians that are very scarce. Among over 2000 industrial parks, primarily focusing on the apparel industry, chemistry, CNC machining, production ... the mechanical engineering industry is the sector with the most shortage of the manpower. According to statistics, in the 10 years ahead, this industry grows and as labor demand remains high for the industry.

According to the Center for Forecasting Manpower Needs and Labor Market Information HCMC (Falmi), for manpower demand in period from 2015 to 2020, that of mechanical industry ranked first, accounting for 28% of labor demand; in which personnel of vocational degree is needed the most, accounting for 50%, followed by colleges - university (30%), unskilled workers (20%). However, the supply can only meet 60% of demand. By 2020, there are four major economic sectors that need a lot of labor, including precision mechanical engineering - automation: more than 8,000 people / year; electronic information technology: 16,200 / year; food processing: 10,800 / year; Chemical - pharmaceutical - cosmetics: Need 10,800 person / year. Demand for qualified manpower in this area tends to increase, which requires employees to actively improve knowledge.

At a national conference of scientists from the Institute of Mechanics (Hanoi University of Technology) in collaboration with training institutions and research organizations dated 13/10/2011, human resources of the sector are assessed to be lacking and limitations on qualifications. Leading experts, skilled technical staff are shortage; labor training are not high; mechanical engineers, graduate mechanical engineers have not risen with the increased demand of the market...

The cause of weakness, according to experts, is due to the small investment in the mechanical engineering industry, lack of concentration, but duplicate; engineering enterprises do not have enough skilled manpower. Besides, the scientific and technological capacity of enterprises, qualification of human resources are limited. Production enterprises are less innovative research. Technology is too outdated compared to the world (around half a century). Besides, the cause from the labor force, such as lack of skilled / experienced when just graduating but highly skilled ones require relatively high wages and makes the business or industrial parks not meet this; and workers in the CNC industry tend to imigrate rather than working in domestic companies.

3.2.2. Human resource practices in Vietnam

Human resource training and education

Until 12/2009, there are about 80 universities and colleges that trained field of mechanical engineering. Development Strategy of Vietnam's mechanical engineering industry till 2010 and vision to 2020 clearly state investment priorities to upgrade the training facilities for mechanical industry and funding for officials and good worker to

go training and internships abroad under the program, projects approved.

General situation of education system in Vietnam are heavy on theory, lack of practice, and knowledge learnt not close to the business needs. Besides, the teaching facilities are backward and lacking.

While mechanic companies are shortage of human resources, especially human resources with high technical level, the students and parents are little interested in this industry.

Labor recruitment of enterprises

Existing industrial parks and export processing zones in southern provinces such as Ho Chi Minh City, Binh Duong, Dong Nai and neighboring provinces are always placed in the shortage of skilled engineers in the manufacturing sector of machine, turning, milling ... in spite of many job postings with attractive salaries. As for the labor market in the northern provinces, the mechanical engineering company in the industrial zones in Hanoi, Bac Ninh, Thai Nguyen also needs to recruit a number of the employees. When watching on sites such as job recruitment 24h, Quick Job Search or Careerlink ... Mechanics is one of the sectors that businesses have the greatest need. Not only the large industrial areas, but also small businesses need the number of technicians that are very scarce.

Income

While the mechanical human resources in the country is severely lacking in this sector, the students prefer to work abroad in foreign countries instead of working for engineering companies in the country. Many companies hire mechanics, mechanical engineers in Korea with an attractive salary of 30 million VND / month. Or the average salary of the mechanical engineer in England is £ 40,000 / year; in the US it is \$ 67,000 / year. Therefore, the domestic engineering companies are getting more labor shortages. Especially, experienced engineers, who has undergone intensive courses, with one of the international certification, is a member of the association, to understand the international standards such as JIS, ASME, ASTM, CSWIP , NDT, Frosio, Nace, Nebosh, PDMS, PMCs, SPR, HVAC & Freezer, Solar Gas Turbine and Gas Compressor, Laser Aligment, Maximo, Amos ... often gain very high incomes and good career advancement. Currently, Vietnam has many engineers who can replace foreigners as OIM, FM, Field Superintendent, Rig Manager, Barge Captain, Maintenance Manager ... with wages from about 4000-6000 USD / month.

Career Development

Shortly after graduation, mechanical engineering students can take on many different positions: as technical staff in technical or operating session in mechanical workshops, participating in research and technical improvements, lectures or software exploitation of the engineering industry as CAD-CAN / CNC ... Employees also have the opportunity to raise the level of master's, doctoral domestic and abroad; advanced training or professional qualifications.

4. Discussions and recommendations for human resource development for mechanical industry in global value chain

The role of skill formation in industrial competitiveness is so basic and widely accepted that it does not require much analysis here. What is worth noting, however, is that with the growing pace of technological change, the spread of information technologies and intensification of global competition, the need for skill development has become more pressing. More importantly, the patterns of skills required to compete in modern manufacturing have changed, as have the tools and institutional structures suitable for skill formation.

Traditional methods of education and training often prove inadequate, even in developed countries. In the traditional setting, industrial development only entailed improving the quantity and quality of primary schooling and basic technical skills, and encouraging all forms of in-firm training. In the emerging competitive setting, greater emphasis has to be placed on high-level, specialized training, with close interaction between education and industry to assess and communicate evolving needs.

Basic skills have taken Viet Nam a long way on its path to industrialization. However, if Viet Nam is to move up the technology ladder and ensure higher value added, the skills competencies in specialized technical areas need to be strengthened.

Viet Nam's current educational and vocational training system does not produce an adequate level of skills for its workforce. Many firms are forced to retrain workers at high costs so they are able to work in those firms. This reduces Viet Nam's competitiveness and makes Viet Nam less attractive for medium- and high-technology

manufacturers looking for lower cost producing countries or alternatives to their Chinese production bases. A lack of skilled workers and managers holds back domestic firms and lowers Viet Nam's overall productivity level, especially compared to China.

Investment in human capital is closely associated with creating a more attractive destination for foreign investment and increasing domestic productivity (Baldacci et al., 2008; Contractor & Mudami, 2008).

The existence of a skilled workforce reduces the need for training and ensures a high quality of production for investing companies and individuals.

Interestingly, investment in education is found to have a substantial effect on export growth, though the effects of increased literacy are very marginal (Contractor & Mudami, 2008). This finding is somewhat intuitive and highlights the significance of investment not only in education, but in higher level education and technical training – especially geared towards industry demands.

In addition to technical skills, “technology management skills” are considered an important area for improving Viet Nam's skills set (Laosirihongthong & Lim, 2008). The lack of technical experience at the managerial level is suggested to deter potential investors. This is being addressed by some universities such as VNU (University of Social Sciences and Humanities, University of Economics) and the National Economic University (NEU) that offer a Master's degree programme in technology management.

Currently, Viet Nam is characterized by a weak collaboration between government institutions, government bodies and private institutions in guiding and shaping the formation of curricula to respond to industry demands (Laosirihongthong & Lim, 2008; Bekkers & Freitas, 2008). There is, however, a number of limited success stories in which technical training has been tailored to industry needs. A number of vocational and technical training centres have been identified as successfully developing technical skills: Cao Thang Vocational College, Viet Nam Germany Centre, Viet Nam Singapore Centre and Viet Nam Japan Centre. These schools are also involved in industrial consulting work which facilitates knowledge transfer from industry back to the academic sphere.

Based on the above facts, key policy recommendations to boost Viet Nam's human resources for manufacturing are as follows:

- Elaborate a study to benchmark Viet Nam's education and training system against major

competitors in terms of quantity, quality, relevance and cost effectiveness, and identify areas of improvement. Viet Nam should use regional benchmarks such as China, Republic of Korea, Taiwan (Province of China) and Singapore;

- Conduct regular skills audits, particularly in vocational training, once the new measures have been introduced;
- Encourage enterprise training using several measures, including subsidized training expenditures and tax exemptions or charge a levy to refund it later;
- Develop a programme to link vocational training institutions with industry, setting up training centres in industrial parks, high-tech parks and export processing zones. A successful university-industry link would require the following:
 - + A longer-term vision and a more strategic approach to replace the current shortterm objectives of simply earning fees in order to benefit the academic system;
 - + To overcome the separation of research from teaching in the university system, more autonomy and incentive systems to encourage innovative research are necessary;
 - + Investment should be more focused to avoid wasting resources and
 - + fragmentation;
 - + Modern university and R&D management practices such as peer review, advisory committees and performance-based evaluations should be thoroughly applied.

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