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The Impact of FDI on the Industrial Upgrading Progress and the Sustainable Economic Growth of Vietnam

by

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Abstract

This paper examines the impact of foreign direct investment (FDI) in the industrial upgrading process of Vietnam based on the concept of the new structural economics. The most recent development of industries in Vietnam is analysed using the annual data published by the statistical office of Vietnam and the studies done by various academics on spillovers effects of FDI. The paper finds the an important role of spillovers effects such as technology transfer, linkages, exports and wage spillovers of FDI to the relatively more sustainable development of the industries. However, the government's support and role is another crucial ingredient in reaping the benefit that FDI brings into the country. The interrelated and inextricable relation among FDI, the role of government and the development level of the economy, points out that a strategic and balance measure in terms of policies and infrastructure facilitation, is needed in going forward on the industrialisation process for Vietnam.

Keywords: foreign direct invest, FDI, spillovers, industrialisation, sustainable development

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1 Introduction

Since the Doi Moi reform, Vietnam enjoys the annual GDP growth averaging at 6.5% during 1990-2017 with the highest at 9.5% in 1995 (GSO, World Bank), which is an impressive feat since sustaining the high growth rate over a long period is extremely difficult. Vietnam's growth has been facilitated by the combination of increasing globalisation of corporate activities, trade liberalisation, the government's efforts in restructuring economy and partly due to the flying geese pattern of Asia manufacturing network. Continuing the reform, the Vietnamese government has been implementing policies and regulations and amending them in order to facilitate the responsiveness required for the changing economic conditions effectively. Vietnam is striking towards the private sector development, export promotion, trade liberalisation and catching up on industrialisation. The reform process has been greatly interrelated with the Foreign Direct Investment (FDI) and it has served as an important catalyst for the progress of the reformation of the economy and the development of the industrialisation process. FDI has been increasing gradually in Vietnam since Doi Moi reform but the significant rise is observed after Vietnam successfully become a member of World Trade Organisation (WTO) in 2007. Vietnam becoming the member of WTO in 2007 contributes in steering the country's economic reform to the better direction and in the efforts to sustain the economic growth. According to General Statistical Office of Vietnam (GSO), the implemented FDI inflow reaching 17.5 billion USD in 2017 with the total registered FDI being more than 37 billion USD. The contribution of the foreign invested sector to GDP and employment reaches 18.5% and 7.8% respectively in 2017.

Vietnam's manufacturing industries received more than half of the total accumulated FDI as of 2017 and the economy has been engaging and flourishing in low-tech industries such as food products, footwear and garments and assembling electronic devices and components. According to Ohno (2009), Vietnam was at stage-1 of East Asian industrialisation catching-up process (figure – 1) back in 2009. At this stage, foreigners are in charge of all aspects such as design, technology, production and marketing and key materials are imported; the host country's participation is only by providing unskilled labour and production space (land). Even though this stage creates jobs, the internal value creation by the local is small and

foreigners dominate. In the next stage of Ohno's industrialisation process, the local suppliers emerge at this stage with the expansion of the production and competition among the assembly firms become fiercer. Moreover, the industry grows quantitatively and the internal value creation also increases fairly but the majority part of the production is still under foreign management and guidance. Vietnam has been trying to develop its industries further and the tremendous growth in the number of low-tech domestic firms and the growing number of medium- and high-tech domestic firms in manufacturing sector seems to indicate that Vietnam is beyond the stage-1 and in transition to the stage-2.

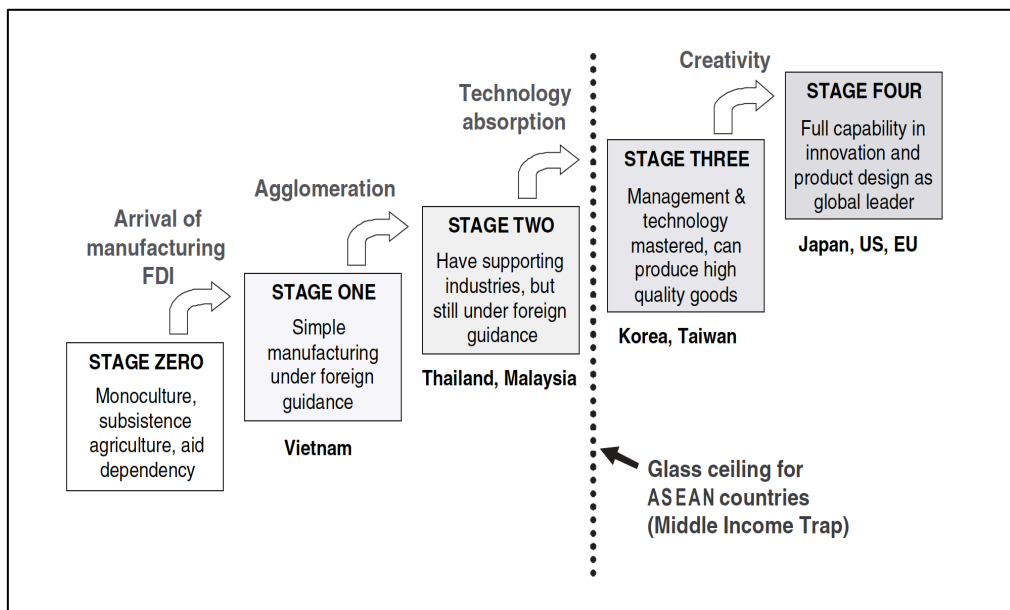


Figure 1: Stages of Catching-up for East Asian Industrialization

Source: Ohno (2009)

As shown in the above figure, Ohno depicts that in the East Asian industrialisation process, the economic take-off starts with the arrival of the manufacturing FDI firms in the light industries such as food industry, garment and footwear. FDI plays as the kick-start for transitioning from agricultural to the early stage of industrialised economy instead of gradually accumulating the capital resources through savings propensity and economic surpluses, which is a slow and difficult process to achieve for the not-yet-industrialised economy. According to the new structural economic, which the analytical framework is based on, the development of the economy differs in accordance with its comparative advantage. The comparative advantage in turn depends on the endowment structure composed of physical and human capital and the economy's surplus is the highest when the specialisation

of production is at the level that is most compatible with the comparative advantage. Thus, FDI could improve the physical capital part of the endowment structure that is crucial in determining the development rate of the industries. However, the other important reason why FDI is desirable is due to the sustainable development aspects it could induce through the spillovers effects. The main spillovers effects of FDI such as the technology diffusion and transfer, enhancing skills and knowledge, creating linkages and competition effect can contribute to the faster and sustainable development of the industries.

Vietnam benefits from the various spillovers effects of FDI and the development pattern of the private domestic firms seems to be in coordination with the positive impacts of the spillovers effects. Even though the development of the domestic firms cannot be credited to the spillovers effects of FDI solely, the correlation is obvious and seems significant. The main weakness of the qualitative study is that the causality cannot be determined and can only be assumed. Another main contributor to the growth of the domestic industry is the efforts of the Vietnamese government. The role of the government in facilitating the development of firms, preventing the externality issues and providing essential infrastructure in order to upgrade from one development level to another is another crucial factor according to the new structural economics. Vietnamese government has been continuing the reform process by implementing and modifying various policies based on the present development level of the economy and facilitating the necessary soft and hard infrastructure. Despite the improvements in various policies, there are several areas in which the government's efforts can be bettered by consulting the recommendations of international organisations such as the World Bank and the Organisation for Economic Cooperation and Development (OECD).

The paper will address *“the impact of FDI on the industrial upgrading progress and the sustainable economic growth of Vietnam”* using the analytical framework based on the new structural economics. The paper will try to determine how far along Vietnam is in this industrialisation catching up process and the role of FDI in different aspects of development channels in supporting the sustainable growth through spillovers effects. The analysis method is the descriptive one using the data published by GSO, World Bank's development data series and the results from the empirical research done on Vietnam by various academics. The paper focuses on the role of FDI in the industrial upgrading process and Vietnamese government effort to attract FDI and facilitate the necessary infrastructure and policies in developing its private sector. The main contribution of the paper lies in determining the

correlation between the spillovers effects of FDI and the development pattern of the private sector. Usually, the spillovers effects are studied through the quantitative methods and the studies focus on specific spillovers effects. This research covers the analysis of the main spillovers effects mentioned before and other relevant spillovers effects observed in Vietnam and their correlation to the development of the domestic sector. As this is not a quantitative study, it might overlook some aspects of the exact causation and correlation and factors that contribute to the developing process. The next session will cover literature review on the impacts of FDI on economic growth through different channels and its spillovers effect. In session 3, the theoretical and analytical framework will be discussed, followed by analytical discussion in session 4. Session 5 will conclude the findings of the paper.

2 Literature Review

There are different types of studies on the impacts of FDI: the macroeconomic studies that focus on the effects of FDI on economic growth of the host countries and the microeconomic studies aims to learn the impacts of FDI on the development of domestic firms. The literature review session is divided into four where the first part covers the macroeconomic studies; the second on the microeconomic studies; the third part focuses on the empirical studies on Vietnam and the fourth is the short summary of the whole session. Definitions of horizontal and vertical spillovers effects and forward and backward linkages are presented below as the micro studies are very much related to the spillovers effects of FDI.

Horizontal and Vertical Spillovers Effects: the horizontal spillovers effect is the intra-industry spillovers effect the domestic firms experience from the presence of foreign firms in the industry. The vertical spillovers effect is the inter-industry spillovers from foreign firms to their domestic counterparts through backward or forward linkages in the supply chain. (Lenaerts and Merlevede, 2011)

Forward and Backward Linkages: The linkages could be forward or backward effect, the former is caused by domestic firms buying intermediate goods from foreign enterprises and the latter happens when domestic firms supply the raw materials to foreign enterprises. (Nguyen Anh et al., 2006)

2.1 Impacts of FDI on Economic Growth – Macroeconomic Studies

Balasubramanyam et al. (1996) use the Solow model with technology, capital, labour, inward FDI and other variables including imports and exports and find that the impact of FDI on economic growth is positive for export promoting countries and might be negative for import substituting economies. With education being added to the model as a proxy for human capital, Blomstrom et al. (1994) and Coe and Helpman (1995) find that the countries need a certain level of human capital in order to reap the positive effects of FDI. Li and Liu (2005)

and Borensztein et al. (1998) find that FDI has direct positive effects on growth as well as the indirect impacts through its interaction with human capital. Alfaro (2003) studies the correlation between FDI and labour productivity in various industries using linear regression method and panel data of 47 countries. The study finds the impact of FDI on the labour productivity of manufacturing industries is positive, while the effect is negative in agriculture and mining sectors.

The studies of Alfaro et al. (2004) and Durham (2004) show that the development level of the domestic financial market of the host country has a large impact on how much the country benefits from FDI. The former study with large sample of countries for the period of two decades from 1975-1995, shows that countries with more liberalized and well developed financial markets gain more from FDI. Durham's study also has the similar outcome and also finds that good governance such as high quality institutions and investor-friendly legal environment enhances the positive impact of FDI on growth. Hsiao and Shen (2003) find that institutional quality and level of urbanization are positively correlated with growth effects of FDI.

While institutional quality could facilitate the positive impacts of FDI on growth; the opposite case of FDI endorses the better institutions is shown by Larrain and Tavares (2004), who find that FDI significantly reduces the corruption. However, Pinto and Zhu (2009) argue that the correlation between FDI and corruption level is positive in authoritarian and poor countries and negative for more democratic countries. This might be due to the fact that foreign or domestic investors in more democratic countries could pressure the government for policy change, which could lead to better institutions and economic growth (Islam and Montenegro, 2002) and also higher competitions could make corruption more difficult (Ades and Di Tella, 1999). Malesky (2009) uses a panel analysis of 27 transitional countries and finds that the more important the FDI is to the transition of the economy, the higher the rate of the economic reform, especially for the manufacturing and service sectors.

On the other hand, there are studies that find the negative impacts of FDI on growth. De Mello (1996) finds that FDI has negative impacts on domestic investment in developed countries, which could indirectly reduce the growth rate. Blonigen and Wang (2005) find that growth impact of FDI is only found in developing countries and not in developed ones and also the significant crowding out effect of FDI on domestic investment in developed countries. Dixon and Boswell (1996) and Kentor (1998) explain the negative impacts of FDI

on long-term growth; it is due to the fact that FDI induced growth such as infrastructure and institutions lead to further foreign investment, which produce negative externalities such as unemployment, over-urbanisation and income inequality.

2.2 Impacts of FDI on the Growth of the Domestic Firms – Microeconomic Studies

The macro study of De Mello (1999) finds the positive correlation between FDI and economic growth in both developing and developed countries and states that the technological and knowledge spillovers brought by investors is one of the main determinants for long-term growth of host countries. The following micro studies show both positive and negative impacts of FDI on the growth of the domestic firms but the positive impacts are observed more compared to the negative ones. The positive horizontal spillovers effects of FDI on productivity are found in various countries such as Australian manufacturing industries (Caves, 1974), Mexican manufacturing industry (Blomstrom and Persson, 1983) and Chinese manufacturing industries Liu (2002). Kokko (1994) and Blomstrom (1985) study the FDI spillovers effects in Mexico, which show that the spillovers effect is not present in the protected industries. Also, the size of the spillovers effects depends on the absorptive capacity of technology by the domestic firms in the host countries and the technological gap between the host countries and the FDI-investing ones. The similar negative correlation is found in Uruguayan manufacturing sectors between the productivity gap and technology spillovers effect; the smaller the productivity gap, the greater the technology spillovers effect since it is easier for the local firms to adopt the technology (Kokko et al., 1996). Blomstrom et al. (1992) find the greater technology spillovers in the industries with higher domestic competition.

On the spillovers effect through backward and forward linkages, Blalock and Gertler (2002) find the positive FDI spillovers through backward linkages for Indonesia using the firm-level data. Similarly, technology spillovers effect through backward linkages is found in Lithuania by Smarzynska (2004). The study in Hungary finds the positive spillovers from the backward linkages while the forward linkages produce negative effects (Schoors and Vander Tol, 2002). The study on China by X. Li et al. (2001) states that the presence of spillovers effect may also be determined by the type of ownership in domestic enterprises. The spillovers effect through

imitation and duplication of technology is only found in private firms but not in State-owned Enterprises (SOEs). In the studies on Indonesia, the type of ownership does not affect the magnitudes of spillovers effects (Sjoholm, 1999) and the enterprises fully owned by foreigners produce greater spillovers effect compared to the joint ventures (Taki, 2001). Blomstrom and Sjöholm (1999) in their study on Indonesian export and non-export domestic industries finds that the former does not experience any significant spillovers while the latter benefits greatly from the spillovers effects.

Negative horizontal spillovers effects are found in 1990s in Bulgaria and Romania (Konings, 2001) and Czech Republic (Djankov and Hoekman, 1998). The macro study by Mencinger (2003) using the panel data of 8 European transition economies from 1994 to 2001 also shows that FDI undermines the catching up process of these countries. The possible explanation is related to one of the negative impacts of FDI spillovers effects, where the FDI creates further competition pressures instead of extra competition pushing the domestic firms to upgrade, it forces them to exit the market due to the small in size and lack of experience. However, Haddad and Harrison (1993) find no negative effect of horizontal competition spillovers in Mexico and competition is more likely to push the domestic firms to improve and become more competitive in low-tech industries.

2.3 Impacts of FDI on the Economic Growth of Vietnam

The study of Hoang et al. (2010) on Vietnam shows a strong impact of FDI on economic growth and states that FDI is the main cause of the improved growth performance. Nguyen and Hemmer (2002) and Tran Tong Hung (2005) also found the similar results using different methodologies and different periods. Pham (2002) analyses the FDI growth impacts using regional microeconomic data and finds that FDI impacts regional development positively by increasing industrial output. Nguyen Mai (2003) studies the impact of FDI on economic growth for the period of 1988 to 2003 and finds the positive correlation between the two at the national level. Hoi and Pomfret (2010) find the impact of FDI on domestic private firms' paid wages in Vietnam: the wage level is higher in the sectors with larger share of foreign firms. Nguyen et al. (2006) find that FDI also raises the investment efficiency and increases the overall labour productivity of private firms in Vietnam. Vu, Gangnes and Noy (2008)

study on China and Vietnam from 1985-2004 find the direct positive impact of FDI on growth as well as the indirect effects through labour productivity in industrial sectors.

2.4 Summary

In an overall economic development in macroeconomic studies, FDI has positive impact on the economic growth and the impact is bigger when the education level is higher. This seems to be the case that when the human capital part of the endowment structure is higher and when FDI comes in as physical capital, which improves the whole endowment structure. This leads to the greater gains for the economy since the absorbability in terms of the human capital is high and it is easier for the spillovers effects to take place. The countries with good governance, more liberalised financial market and better institutional quality benefit more from FDI. Moreover, FDI could improve the quality of the institutions and encourage the economic reform for the better. This means that the soft and hard infrastructure is important for reaping the benefits from FDI and FDI could have impacts on the decisions of the government's policies and regulations in return. On the other hand, FDI could also have little or negative impacts on the host countries as well. The most common negative impact of FDI is the crowding out effect on the domestic investment, especially in the developed countries.

In the microeconomic studies of the impact of FDI, the various spillovers effects and different types of impacts are documented in both developing and developed countries. The positive technology spillovers effect is found in many countries and it seems to be closely correlated with the absorbability of the domestic firms. The important channel for the technology transfer seems to be the backward linkages with the foreign firms. The impact of spillovers effects also depends on the type of industries, type of ownership of the domestic and foreign firms; thus the magnitude of the impact could vary across different industries and economies. The horizontal competition effect of FDI could be either positive or negative depending on the industries and countries. This effect seems to be negative especially in developing European countries, which leads to the question of whether it is the region-specific problems due to certain policies or regulations. This case leads to the point that it is important for the government to facilitate and impose policies for the benefit of the local firms in order for them to become competitive with the foreign firms while welcoming the FDI into the country.

Even though the empirical evidence on Vietnam is limited, based on the results from both macroeconomic and microeconomic studies, Vietnam seems to benefit from FDI in terms of labour productivity, improvement in wages, efficiency, productivity, technological spillovers, skills transfer and capital accumulation. Most of these studies are quantitative type focusing on each spillovers effect. This paper will make use of different data including the results obtained in some of the above studies following the analytical framework based on the new structural economics and analyse the impacts of FDI on the development of Vietnam's economy. The next session will discuss the background theories and the analytical framework.

3 Theoretical and Analytical Framework

3.1 Theoretical Background

3.1.1 New Structural Economics

Lin (2012) defines the three major concepts of the “New Structural Economics”. The first is the endowment structure of a country determines the nature of the development of its economy. Thus, the industrial structure of an economy differs based on its factor endowment. The factor endowment structure evolves with the level of development and then the improved factor endowment further upgrades the economy to the next stage with the support of the appropriate level of soft and hard infrastructure that could facilitate the operations. Here, the endowment structure means the physical and human capital and land is excluded since it is exogenous and could not be changed. The countries at the early stage of development tend to be equipped with relatively scarce capital and abundant labour compared to the more developed countries, the production pattern of the former tends to be more labour-intensive and less capital-intensive and vice versa for the latter based on to the comparative advantage.

The developing countries have the advantage of backwardness when adopting and catching up the industrialisation due to the diminishing return to capital and the faster rate of acquiring the existing technology as the predecessors have already paved the way. However, it is important to develop the right level of technology and industries that is appropriate for the current factor endowment structure. The infrastructure needs to be accommodated in order to develop the industries successfully. When local firms are developed with appropriate technology into the right level of industries compatible with the current comparative advantage, the economy is the most competitive (Lin, 2012: 24). This is the second point mentioned by Lin that the developing countries’ approach or targets to upgrade the industries and the required infrastructure does not necessarily follow the existing pattern of high-income countries.

The failure of many Latin American, African and South Asian countries in the 1960s and 1970s serves as an example. Their essential features of the development strategy, the import substitution and protection, lead the developing countries to defy their comparative advantage

and implement the development of the capital-intensive heavy industries when their economies are not yet ready in terms of physical and human capital. In order to carry out this development plan, the country's government has to protect numerous unsustainable industries from import competition (Lin, 2009a; Lin and Li, 2009). These protectionist schemes produce major undesirable outcomes such as the price increase of the imports and import-substituting goods, fragmentation of the markets by producing various small-scale goods with low efficiency, decreased competition from the foreign firms and higher input and transaction costs due to more opportunities for rents and corruption (Krueger, 1974; Krugman, 1993).

The third point is the active role of the government in facilitating structural changes in addition to well-functioned market mechanism that allows effective resource allocation, is crucial in endorsing the successful economic development. In the old structural economics, governments are advised to develop the advanced capital-intensive industries while defying its economy's comparative advantage and resulting with undesirable outcomes. The new structural economics focuses on the efficient resource reallocation of the market and endorses the policies of governments playing the facilitating role to coordinate effectively and address the externalities that firms face in the industrial upgrading process.

In the industrial diversification and upgrading process, the state should mainly focus on its role of nurturing new industries through policies and attracting FDI, facilitating the information about the new industries, drawing policies to compensate the pioneer firms for their losses due to externalities (Lin, 2009a; Lin and Chang, 2009; Lin and Monga, 2011). Another important role of the state is facilitating the soft and hard infrastructure required for the industrial development process. The development of the hard infrastructure (electricity, road access, transportation, port facilities, telecommunication systems, etc.) and soft infrastructure (regulations, policies, institutions, social capacity, etc.) is very important in reducing the transaction costs of firms and hard to implement without the state's leadership.

3.2 The Impacts of FDI in the Industrialisation Process

In the new structural economics, the industrial upgrading requires the improvement in the endowment structure including physical capital. The capital accumulation depends on the

savings propensity of the economy and the economic surplus (profits). When each level of the development of the industries is implemented gradually based on the corresponding endowment structure and comparative advantage, the largest economic surplus and savings will be achieved. This will allow the highest possible upgrade in the factor endowment structure and capital accumulation is achieved through the gradual development process. Another method of capital accumulation in a much faster way or a shortcut is to attract the foreign direct investment.

Especially in developing countries at the early stage of or before the structural transformation starts when fostering capital accumulation through savings and economic surplus is difficult, FDI could act as a kick-start for transitioning from agricultural to the early stage of industrialised economy. However, the main reason why FDI is so desirable is due to the sustainable development aspects it could induce. The spillovers effects of FDI such as technological diffusion and transfer of skills are one of the main reasons why FDI is very attractive to the developing economies. The spillovers effects might best work and relatively more significant when there is a wide gap between the foreign and domestic firms, where the former equipped with more advanced technology and more capital to invest. Nguyen Anh et al. (2006) states four main spillovers effects of FDI, which could help accelerate the industrialisation process: 1) technology diffusion and transfer; 2) human capital, diffusion of knowledge and labour skills; 3) forward and backward linkages; and 4) creating competition effect.

3.2.1 Technology Diffusion and Transfer

The developing countries at the early stage of industrialisation, they imitate or borrow the existing technology held by the developed countries. The cost of borrowing the technology is much likely to be cheaper than the innovation through R&D (Lin, 2012). By inviting the foreign companies already equipped with the technology to operate in the economy, it could trigger one of the most desirable spillovers effects of FDI: the diffusion and transfer of technology. This spillovers effect is important for the long-term sustainable growth and climbing up the ladder of comparative advantage for the developing economies. When foreign firms invest and move/expand the production into the host economy, they bring along the sophisticated technology into the local production environment. The domestic firms in developing countries, who lack in technology capacity, overcome this obstacle through direct

cooperation with foreign partners via joint ventures or adoption of the technology through diffusion and transfer. In the case of foreign firms being reluctant to share their technology with the local firms, government policies that encourage the foreign firms to establish joint ventures with local firms or making the technology available to the domestic firms via other means are important in order to make sure the domestic firms benefit from the FDI through this channel. The rate at which the industries develop through technology diffusion and transfer hugely depends on the absorptive capacity of the domestic firms and both soft and hard infrastructure of the economy. While infrastructure development depends much on the state's leadership, the absorptive capacity is closely related to the human capital and knowledge dissemination. The higher the technology, the more skilled and trained labour is required for the effective operation of the production. This brings us to the next spillovers effect of diffusion of knowledge and labour skills and how human capital can be improved.

3.2.2 Human Capital, Diffusion of Knowledge and Labour Skills

Upgrading the industry involves handling and managing relatively more advanced technology, production process, marketing strategy, skills and complex managerial process and also R&D and innovation at the higher technology level industry. Improving the human capital increases the workers' ability to absorb the new technology and catching up the managerial skills. When the industry is getting closer to the technological frontier, human capital becomes all the more important since the industry moves on from borrowing the mature technology to innovating the new and less mature technologies. At this stage, human capital becomes progressively complementary to the physical capital (Lin, 2012).

Spillovers effect of FDI associated with human capital is the diffusion of managerial knowledge and labour skills: the new skill and knowledge achieved by the domestic economy. This effect occurs via FDI firms' employment of local people in the positions, which enable the skill transfer such as managerial and professional tasks, research and development and training of technical workers. The spillovers effect happens when these labours exit the FDI enterprises and join the local firms or establish their own. However, the rate of the development of this effect depends much on other factors such as labour market conditions, demand for skilled workers and regulations for market entry for new firms. Cross-border mergers and acquisitions (M&As) could play a channel for this spillovers effect and thus contribute to the economic growth. The entry of foreign firms could stimulate the

competitiveness of the domestic firms and provide the acquired firms access to the multinational enterprises (MNE) networks (supplier and client wise), latest technologies, advanced management and corporate governance practices.

3.2.3 Backward and Forward Linkages

This spillovers effect of creating forward/backward linkages is related to input-output structure of the firms. This effect occurs due to the business transaction between foreign enterprises and domestic firms in regards to the raw materials or intermediate products. There could be forward or backward effect, the former is caused by domestic firms buying intermediate goods from foreign enterprises and the latter happens when domestic firms supply the raw materials to foreign enterprises. Under the backward effect, the domestic firms' production will be expanded and the quality of the product will increase as well. The product quality improvement is due to the requirement imposed by the foreign enterprises and it benefits the domestic firms by making them more competitive in the product market. The domestic firms may progress gradually and upgrade or expand their production in the long run. It also opens the opportunities for the domestic firms to be developed enough to participate in the global export market or dominate the domestic market.

3.2.4 Creating Competition Effect

Another spillovers effect is the competition effect that foreign firms place on the local ones. This effect could have positive or negative impacts depending on the market structure and technology level in the host country. The negative impact of this effect comes from domestic firms being unable to withstand the competition from foreign enterprises, for instant, the new products of FDI enterprises replacing the products currently produced by the domestic firms. When the domestic firms could not adapt to the new competitive environment, they have to exit the market. The positive impacts are achieved when domestic firms successfully upgrade and adapt to the new competitive market, which is a sign that they become more competitive and efficient.

3.3 Analytical Framework

The analytical framework presented in figure – 2 below is based on the new structural economics concept of the industrialisation process that is determined by the present factor endowment structure; developing the current industrial stage and upgrading process contributed by the impacts of FDI and the government's actions. The process starts at Industrialisation Current Stage that is determined by the present factor endowment structure, which is the present physical and human capital, with the technology available. Under the right level of industrialisation that matches the endowment structure, the industries and firms grow competitively and they gradually gain market shares both domestically and internationally. This would lead to making the highest form of profits and income and allow the accumulation of both physical and human capital over time and the industries would advance along with the upgraded endowment structure in the next step. This industrialisation process will develop gradually without the help of FDI depending on the strength of the endowment of the economy. When an economy receives FDI, the first obvious impact would be as shown in the figure, the first arrow of FDI labelled physical capital goes into the factor endowment since it becomes a part of the capital accumulation. FDI accelerates the industrialisation process by improving the endowment structure instead of the economy accumulating the capital gradually over time.

What is more crucial is the second arrow of FDI through the various spillovers effects. No matter the level of the industrialisation stage of a country is, the impacts of spillovers effects could be seen in the rate at which the development progresses and more importantly the sustainability of the development process. As Lin (2012) mentions in the new structural economics concept that technology has to be constantly developing and evolving for the industrialisation process to move up, the technology diffusion and transfer spillovers effect could be said the most desirable spillovers effects that FDI offers. At any stage of the industrialisation, the required technology must be acquired for the domestic firms to be developed. By having the foreign invested firms, the technology could be acquired more easily and quickly and in a more cost-effective way than otherwise. It could be done through different methods such as learning by doing, joint ventures and backward linkages. The backward linkages of FDI is very much related to the technology diffusion since most foreign companies demand the local suppliers to meet their required standard and thus most likely to share their technology with the domestic firms and provide training if needed. Through the

forward linkages, the domestic firms could benefit from having access to the better quality intermediate goods at a cheaper price as they do not need to be imported.

The skills transfer spillovers effect could help accelerate the upgrading progress of the human capital part of the factor endowment structure. One traditional method of improving the human capital is through educational attainment. When the industries are upgraded and more developed, the demand for the skilled labour will go up with every level of the development. The wages for the skilled labour will increase proportionately to the demand and thus the return to education will go up. If the cost of obtaining the education is lower than the return, individuals will invest in it. The human capital accumulated through formal education is the basic foundation. What FDI spillovers effect could contribute is more related to industry-specific skills and knowledge and is more valuable if the skills or knowledge (e.g. technical skills related to high-tech production or complex managerial skills and knowledge) the foreign firms bring over is at the development level that the host country's economy is not yet achieved, yet not too far ahead. Without FDI firms, the domestic firms will have to learn these skills and knowledge gradually by trials and errors, which is likely to take a longer period of time.

The dynamic process of industrial upgrading not only requires the constant technology upgrading, improvement skills and knowledge but also the infrastructure improvements to facilitate the development and policies to guide it through. As an extremely effective coordinated process is required, the government needs to take actions and cooperate with different parties and stakeholders. The government's role in developing the right level of industries based on the endowment structure is crucial in leading the economy to the right track. The government's actions such as implementation of infrastructure, FDI policies, industrial policies have direct impacts on the nature of and the rate at which the industrialisation process develops. Moreover, government could play a role in improving human capital by increasing the spending on education and make the basic education free.

The third arrow going into the industrialisation process in figure – 2 represents all these different actions taken by the government. The third arrow of FDI goes through the role of government since FDI could only be invested in the countries through government's policies and regulations. The arrow being two-sided indicates that the amount or nature of FDI will be shaped by the state policies to some extent and FDI could also influence the policies considered by the state, for example policies set by the state to attract FDI. The final two-way

arrow from FDI to Industrialisation Current Stage represents the correlation between FDI and the development level of the industries as the development level could influence the FDI inflow as much as FDI could affect the growth of the industries. As industries and firms climb up the comparative advantage ladder further and the upgraded industrialisation stage becomes relatively more capital-intensive, the chance of the FDI inflow increases also gets higher since the industries become higher-level technology and product diversification also broadens.

As the industrialisation keeps on upgrading, the technology level will become more and more sophisticated and getting closer to the global technology frontier, the need to innovate also increases. The process of acquiring the technology is likely be more costly and operational process such as skilled labour, administrative and management might be at the higher level and more complicated. At the very advanced technology level, the competition is very high and borrowing the advanced technology would be more difficult. When firms adopt existing technology at the early level of development, the production is aimed for the mature markets and firms only face the risk in managerial ability. At a higher level though, firms need to innovate to be able to produce new products and also explore new product markets. At this level, the impact of the skills and knowledge transfer spillovers effect of FDI could be bigger. However, the impact of technology diffusion and transfer might slow down as the higher the level of technology, the more reluctant for it to be shared by the foreign firms.

Stronger and higher level of forward and backward linkages is likely to be created with the expansion of the industries and the local enterprises established in the previous stage should be at a more mature level, too. The combination of the existing, more mature enterprises and the new foreign and local firms joining the market, the competitiveness in the economy should increase; which could enhance the efficiency of the firms. The negative competition effect of FDI firms would be smaller when domestic firms become more developed, mature and possess the capability to compete in the market. The government also needs to continue with its role in facilitating the appropriate infrastructure and policies for the different level of industrialisation and take on various measures and supports as necessary. This process will repeat till the Industrialisation stages are fully developed and catch up with the global frontier.

As mentioned in the introduction, Vietnam seems to be in transition from stage-1 to stage-2 of Ohno's East Asia industrialisation framework. The main differences in the features of the two stages are the rise in the domestic supply firms and the expansion in the production alongside the increase in the competition. As the industry grows quantitatively, the internal value

creation also increases fairly, however the majority part of the production is still under foreign management and guidance. Accumulation of skill, knowledge and human capital plays a crucial role in taking over the production positions occupied by foreigners such as management, technology, logistics and marketing. In terms of the analytical framework, the next session will analyse whether the different spillovers effects of FDI have the positive impacts on the expansion of the domestic supply firms and develop more in order to take over some parts of the production management from the foreign firms. Along the way, the paper will try to determine the different impacts of FDI on the improvement of Vietnam's endowment structure in terms of physical and human capital, which is a crucial factor for climbing up the comparative advantage ladder. Subsequently, the paper will analyse the importance of the role the government in developing the domestic sector and the progressing in the industrialisation process using the analytical framework.

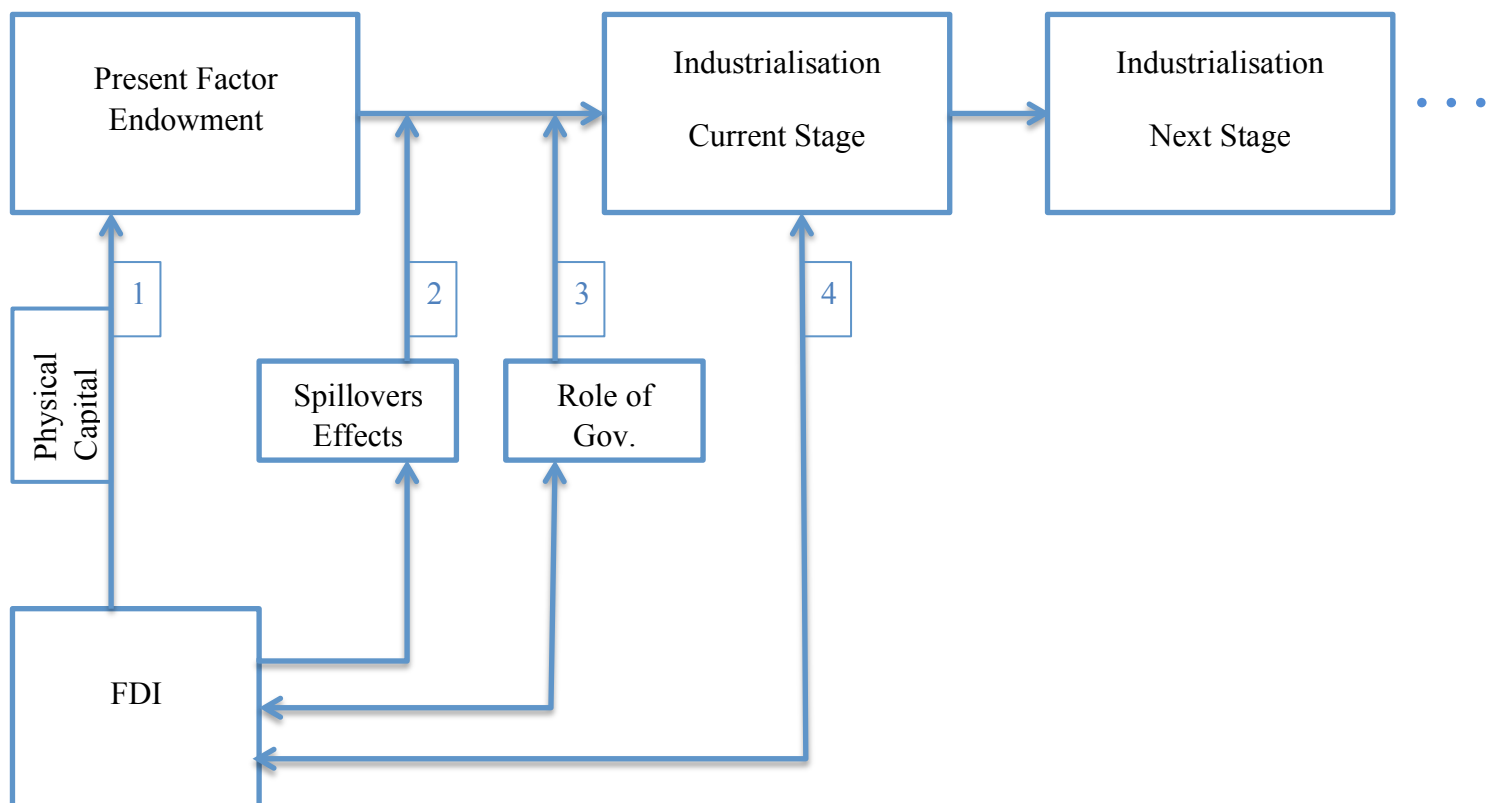


Figure 2: Analytical Model – The Impact of FDI and Role of Government in the Industrial Upgrading Process

Source: Self-drawn based on New Structural Economics framework by Lin (2012)

4 Analytical Discussion

The data presented in the session are mostly collected from the annual statistical yearbook published by GSO and some are retrieved from World Bank and United Nations Conference on Trade and Development (UNCTAD). The spillovers effects from foreign firms are analysed using the results of previous studies done by various academics. This session will first analyse the general impact of FDI in the two highest FDI receiving industries; followed by discussing the spillovers effects of FDI; and lastly study on the actions and policies of government, the development level of industries and FDI inflow have impacts on and interrelated with each other.

4.1 Impact of FDI through Different Channels

As discussed in the theoretical session, FDI could be a shortcut to capital accumulation for the developing countries including Vietnam. FDI inflow in Vietnam as the percentage of gross fixed capital formation is the highest in 2016 and 2007 at around 25% and the average of about 15% in the decade of 1995-2005 also increases to 22% in the 2006-2016 period (UNCTAD, 2019). The sudden rise in FDI share of capital formation in 2007, which is more than double of 2006 and the main reason seems to be the ascension to WTO. This level of FDI contribution to the gross fixed capital formation is far higher than most of the developing countries, especially the ones in Southeast Asia (Masina, 2012).

Majority of the total accumulated FDI inflow as of 2017 goes to the manufacturing and real estate activities as each receives about 58.4% and 16.6% respectively. These two sectors account for the three quarter of the total accumulated FDI with another 10% going into electricity/gas supply sector and accommodation and food service sector (Appendix – 1). The real estates sector that receives the second highest FDI inflow has shown significant growth between 2005 and 2016 with the share of the average capital size of the sector growing from 2.4% to 10.5% (Table – 1), reaching the fourth highest position. However, when we look at the growth of the number of enterprises and employment share in this sector, the former

increases from 1.3% to 2.3% and the latter 0.5% to 1.2% during 2005 and 2016. This type of growth contributes to the capital formation but does not contribute much to the development in terms of the number of enterprises and employment. During the same period, the percentage of average capital size of manufacturing sector decreases from 23.3% to about 20% and this fall reflects in the share of enterprises in that sector, from 19.4% to 14.9%. However, the share of the employment remains about the same and this implies that the share of employment in the sector increases.

The investment in sector like real estates can be withdrawn unexpectedly and suddenly since there is no investment in assets like production mechanisms such as factories, machineries and employees. The economy may benefit for the short period when capital remains in the economy but once it is withdrawn it will take away the benefits as well. Sometimes, sudden withdrawal of large amount of FDI could even create distortion in the related sector market (especially, a sector like real estates) if foreign investors hold the huge amount of market share. This information shows that not every contribution of FDI to the capital formation brings in the sustainable aspects of the development process such as increasing the employment level. Thus, it is important for FDI to be guided into the right direction for the better contribution to the sustainable growth of the economy. This takes us to the next discussions on the spillovers effects of FDI and how much it contributes to the development of the domestic economy.

Table 1: Share of Average Capital Size, Enterprises and Employment by Real Estate and Manufacturing Sectors

	Share of Average Capital Size (%)	Share of Number of Enterprises (%)	Employment Share (%)
Real Estates Sector			
2005	2.4	1.3	0.5
2016	10.5	2.3	1.2
Manufacturing Sector			
2005	23.6	19.4	48.6
2016	19.9	14.9	48.2

Source: GSO

4.2 Impact of FDI through Spillovers Effects

This session discusses the second arrow presented in the analytical framework and analyse the impacts of spillovers effects on the development of the domestic manufacturing industries in Vietnam. Empirical studies on the spillovers effects of FDI in Vietnam might not be as many but they are in support of the presence of the spillovers effects through various channels. All of the studies are heavily reliant on the annual enterprises data and the survey data released by the GSO and carried out using various estimation methods with the study period ranging from 2000 to 2006. The evidence of spillovers effects related to technology transfer, linkages, competition and skills and knowledge transfer is observed in the empirical studies of Vietnam. Other spillovers effects such as wage spillovers, export spillovers and regional spillovers are also present.

4.2.1 Technology Spillovers and Linkages

The most prominent spillovers effects presented in Vietnam are the technology transfer and the backward linkages with foreign firms and the backward linkages seem to serve as the main channel for the technology transfer. Hoi and Pomfret (2011) find the higher productivity is observed in the domestic firms in industries with the higher presence of foreign firms and backward linkages, and the technology transfer happens through the backward linkages the most. Nguyen Phi Lan (2008) also finds that the positive impacts of horizontal and backward linkages of foreign firms on domestic firms productivity and negative impact is observed only through the forward linkages. Both low- and high-tech domestic firms benefit from the backward linkages with foreign firms and the positive horizontal spillovers might be due to domestic firms improving the technical aspects through learning by doing or imitating.

The majority of foreign firms in Vietnam are low- and medium-tech level firms throughout the years. About 89% of foreign firms in 2005 are low- and medium-tech level firmsⁱ and even though the share drops a bit in 2016, it still makes up about 81% (appendix – 2). In this case, through backward linkages and technology spillovers, the low-tech domestic industry would have developed first. In 2016, 96.7% of the total number of firms is operated by non-state domestic enterprises and 15% is in manufacturing (GSO, 2017). The total number of manufacturing firms is 7 times that of 2000; fabricated metal products industry with the highest number of enterprises, followed by food industry being the second and garment

industry with the third highest number (appendix – 3). More than 86.4% of the enterprises are in the small enterprises group with average capital size of less than 50 billion dong; in which 65.7% of them are the firms with capital size of less 10 billion dong (about 42000 USD) and 20.6% with the capital size between 10-50 billion dong (GSO, 2017). The data shows the flourishing low-tech sector and the small enterprises and seems to support the positive impact of technology and backward linkages spillovers effects of FDI.

The rise of the low-tech domestic sector seems to be spectacular but not without a hitch as some of the firms and industries suffer from negative competition effects from foreign firms. Hoi and Pomfret (2011) find the negative impact of the horizontal presence of foreign firms with varying degree depends on types of firms and industries. The negative impact of foreign firms on productivity is significant in private firms, domestic-oriented firms, non-R&D firms and low-tech firms while the impact is negligible in SOEs, collective firms, trade-oriented firms, R&D firms, firms in medium- and high-tech industries. Nguyen Phi Lan (2008) also finds the similar result of low-tech domestic firms being affected negatively by foreign firms. However, the low-tech domestic sector seems to overcome after upgrading their technology, production technique and adapting to the competition in the market after some period. The positive impact from backward linkages and the technology transfer spillovers effect is likely to have outweighed the negative impact of the competition effect overtime.

In a study in 2005 by Pham Xuan Kien (2008) states that Vietnam benefits more from the less capital-intensive and more labour-intensive foreign firms, due to the relatively cheap labour force offered by developing countries. After more than a decade, Vietnam is trying to climb up the comparative advantage ladder with improved endowment structure. Both the share of medium- and high-tech level firms increases even though the increase is quite small in high-tech level industry (figure – 3). One of the reasons for the higher growth of medium-tech firms is definitely due to the fact that medium-tech domestic firms benefit from forward linkages with foreign firms, which high-tech domestic firms do not have the privilege of (Nguyen Phi Lan, 2008). It seems that medium-tech domestic firms benefit from the higher quality intermediate goods at lower cost, which helps increase the productivity of firms and gain from economies of scale. Another obvious reason is that even though the foreign investment in high-tech level firms also increases, the low- and medium-tech level firms are still the majority (appendix – 2), and thus the technology spillovers and skills and knowledge

transfer through backward and forward linkages would be greater at low- and medium-tech levels compared to the high-tech one.

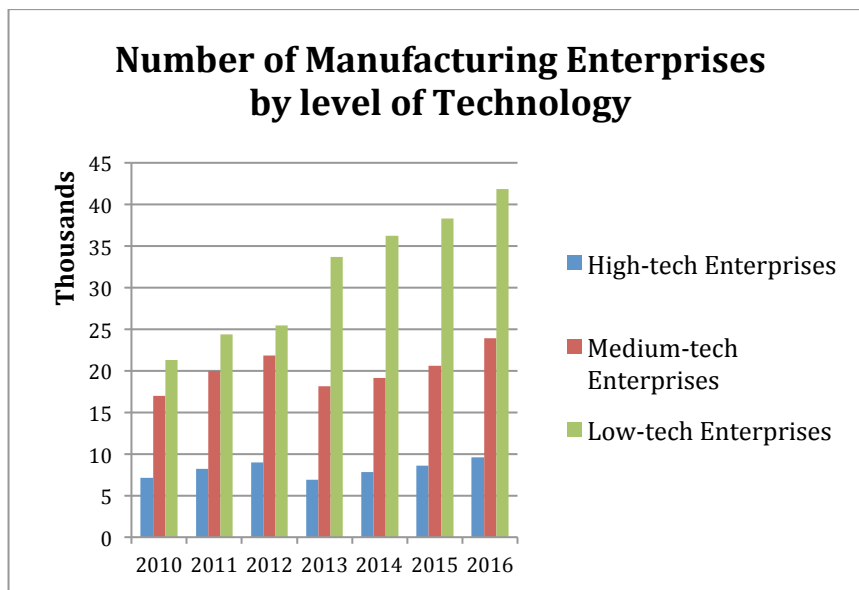


Figure 3: Number of Manufacturing Enterprises by Level of Technology

Source: GSO, 2017

Another reason for the slow growth in the medium- and high-tech firms might be due to the low absorptive capacity of the domestic firms. How much firms benefit from horizontal and backward linkages depends on the absorptive capacity of domestic firms such as human capital, financial development and technology gap. Domestic firms with higher human capital, better financial development and lower technology gap have greater absorptive capacity and thus they benefit more from the spillovers effect (Nguyen Phi Lan, 2008). Hence, this might also be the case that Vietnam's endowment structure is not ready to move towards medium- and high-tech industries yet and there is also the sign of retreating in the medium- and high-tech sectors in 2012-2013 as shown in figure – 3. The number decreases visibly in both medium- and high-tech sectors, it might be the case that domestic firms exit the market due to not making enough profit or some foreign firms moves the firms to another country. Even though one of the studies shows that medium and high-tech domestic firms are not affected by the negative competition effect, the study took place around 2000 – 2006. The number of medium- and high-tech firms of both domestic and foreign owned increases since then. With more fierce competition from both foreign and domestic firms, the competition level in medium- and high-tech industries probably goes up and the negative competition effect comes to present.

A study on Vietnam by Giroud (2007) also supports the development pattern discussed above. In his comparative studies on the knowledge transfer of MNEs to the host country on Vietnam and Malaysia that the longer the foreign firms remain in the host country, the more engaged the knowledge transfer activities with their local suppliers are and thus the impacts are greater. The longer the foreign firms settle in the host country, the more established their supply network with the domestic firms is and the technology and skills transfer are done at a higher level after the trust is built. This pattern follows in the progress of the development of Vietnam's medium- and high-tech industries as the number of domestic firms gradually increases with the higher presence of the foreign firms in the respective industries. Since low- and medium-tech foreign firms remain longer in Vietnam, the development in those sectors are higher and the tremendous growth of low-tech domestic industries can be explained by the absorptive capability by the domestic firms and Vietnam's current endowment structure. From this growth pattern, it can be assumed that the impacts of spillovers effects from the foreign firms are huge and significant in the development of the domestic firms.

This also implies that when the growing number of domestic firms are developed enough to engage in the backward linkages with the medium- and high-tech foreign firms, it could lead to the establishment of the local supplies network as the time the medium- and high-tech foreign firms settle in Vietnam becomes longer. With the increasing backward linkages with foreign firms, the opportunity for technology transfer through this channel would become higher. The slow development in medium- and high-tech level industries seems to be the case of the lacking in the current endowment structure. Even though, the number of high-tech foreign firms increase, it would be difficult for most of the domestic firms to absorb the technology when the gap is too big. The ones who are capable of most likely to be SOEs and it seems that the government plans to push the SOEs towards high-tech and large enterprises, as the number of SOEs are halved during 2005 – 2016 and the reduction is in small and medium capital-sized enterprises and the number of large capital-sized SOEs increases (appendix – 2).

This indicates that SOEs are either developed into high-tech enterprises or combined the small and medium SOEs into a bigger one. Either way, this would allow the SOEs to be more competitive with the foreign firms especially the export-oriented ones. That is if the SOEs become more efficient since many economists believe that SOEs in general lack motivation to pursue the highest gain and efficiency compared to private firms (Ramstetter and Phan, 2013).

Minor et al. (2018) also estimates that the services and manufacturing sectors would benefit the large increase in productivity from the further SOEs reform in Vietnam. This productivity increase could lead to the relatively more competition for the factor of production (capital and labour) and thus could result in more effective resource allocation. The SOEs in Vietnam enjoy the privileges such as not facing harsh budget constraints, being entitled to credit, investment, which private enterprises do not have easy access to (Vu-Thanh, 2017). As McMillan and Woodruff (2002: 156) mention that Vietnam has seen the robust growth of its private sector without much support from the state in terms of formal institutions to facilitate business; it could boost the growth of the private sector if the government could redirect some of the resources in order to develop and expand the private sector to its full capacity as well as to encourage the efficiency and competitiveness of the market.

4.2.2 Spillovers from Fully Foreign-owned Firms and Joint Ventures

Although both fully foreign-owned firms and joint ventures produce positive spillovers effect via backward linkages; yet joint ventures are more likely to produce more benefits through backward linkages compared to the fully foreign-owned firms since the former has already made contacts with local suppliers through their local partners and more likely to use inputs from local suppliers (Hoi and Pomfret, 2011). They also find that the fully foreign-owned firms have negative competition effect on domestic firms' productivity but the joint ventures do not produce this impact. This might be due to the fact that fully foreign-owned firms usually possess more advanced technology, which enables them to be more competitive and affects the domestic firms negatively. Pham Xuan Kien (2008) also shows that strong positive spillovers effect on labour productivity from different types of joint ventures while excluding fully foreign-owned firms. It is likely that the skill and knowledge transfer to local workers may be higher with joint ventures than fully foreign-owned firms since in the latter, high positions which facilitate skills improvement, learning opportunities might be occupied by foreign employees (Pham Xuan Kien, 2008). In joint ventures, at least some high-positioned employees of domestic partners side would benefit the skills and knowledge transfer.

Even though joint ventures seem to produce positive and greater spillovers effect compared to fully foreign-owned firms, the share of fully foreign-owned firms increases from 56% in 2000 to 85.5% in 2016 (GSO, 2005-2017). If this is combined with the increasing share of the foreign firms in high-tech level industry (appendix – 2); this is in line with the hypothesis that

the higher the technology, the more reluctant the foreign firms are to be in joint ventures in order to keep the technology to themselves. Then, it might be more difficult for domestic firms to benefit from the spillovers effects from foreign firms at the higher technology level industry. In this case, the intervention from the government such as incentives for the foreign firms to be in joint-venture with the domestic firms and the facilitation to increase the positive spillovers effects from the fully foreign-owned firms will be of great help in developing the industries further.

4.2.3 Exports Spillovers Effect

Vietnam's exports sector grows significantly from 2010 onwards as shown in figure – 4. However, most of the growth is contributed by the foreign exports sector and the growth of the domestic exports firms is very gradual and barely progressing after 2010. The exports sector's growth is also contributed by the spillovers effects from foreign firms since Anwar and Nguyen Phi Lan (2011) show that the horizontal linkages with foreign firms have positive spillovers effect on domestic firms regardless of technology level and encourage the domestic firms to enter the export markets and increase their export volume. Relatively superior domestic firms and SOEs are most likely to enjoy the spillovers effects from foreign firms and join the exports market. As the study suggests that relatively large domestic firms with higher capacity are more likely to survive in the competitive export market and the survival of the smaller firms that could not bare the huge sunk costs is not as high. For SOEs, they are the only domestic group who benefits from positive effects of the horizontal linkages as they are more equipped with the capacity to imitate the goods produced by foreign firms and have better access to the information related to the export market. As for private domestic firms, they rely more on their innovation and better access to good quality intermediate inputs through forward linkages, which help reduce the production costs and increase the export volume.

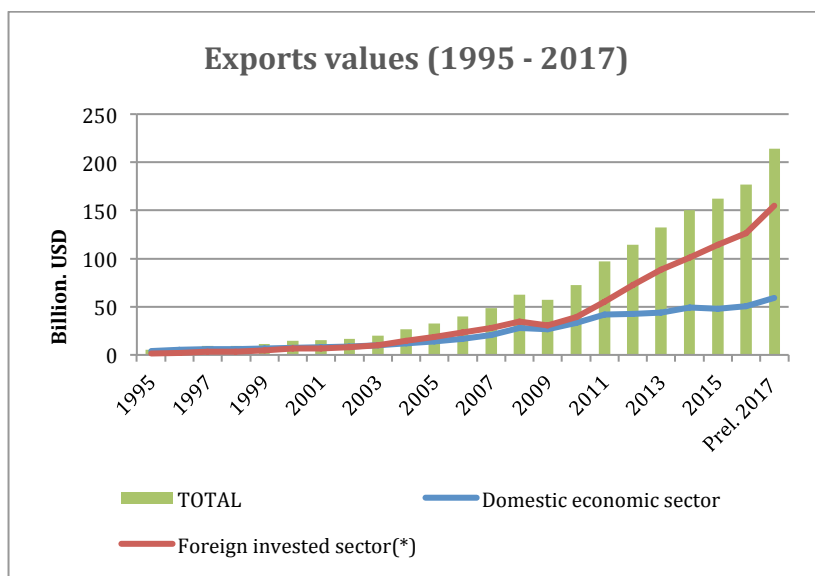


Figure 4: Total Exports Values (1995 – 2017, bill. USD)

Source: GSO

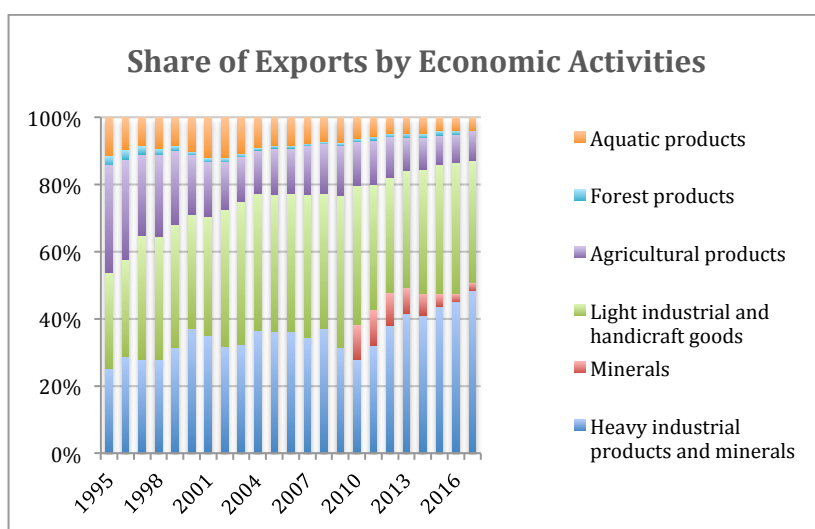


Figure 5: Share of Exports by Economic Activities (1995 – 2017)

Source: GSO

(*) Data in period 2005 - 2008 are adjusted due to non-monetary gold is excluded from light industrial and handicraft products as separated commodity group

The paper suggests that Vietnam seems to benefit from strong imitation and knowledge spillovers from these results and most of the export firms in Vietnam is in the low-tech industry such as textiles, garments, food and furniture due to the positive impacts from forward linkages being present in low-tech domestic firms only. The development pattern is also similar to the ones discussed in the spillovers effects of technology transfer and linkages. It can be assumed that foreign exports firms mostly invest in low- and medium-tech industries

at the early stage of development as most of the foreign firms' investment is in these industries. With the foreign firms mainly export the low-tech products; the spillovers effects would be in the low-tech domestic exports sector as well. Since the quality requirement for exports products are of international level and the survival in the exports sector is more harsher than the domestic market, only the low-tech domestic firms that are established and developed earlier are more likely to be able to participate in the exports market. The development of the exports sector in terms of exporting products shown in figure – 5 supports this assumption as the dominance of the primary sector products in 1995 to the overtaking by light and heavy industrial products. The growth of the heavy industries can be seen clearly after 2010 and it coincides with the sudden increase in the exports share of foreign exports sector. The increase in exports volume might be due to becoming the member of WTO and more foreign firms settle in Vietnam to engage in the exports sector. This data is in favour of the hypothesis of domestic exports firms lacking behind in competitiveness at the international level, especially in the medium- and high-tech sectors and not benefitting from the exports spillovers effects.

The higher the technology is, the harder it is for the domestic exports firms to compete with the foreign exports firms. The domestic export firms who are able to join in the exports market at a higher-level technology industry are the ones who could benefit from horizontal linkages. In other words, the firms with resources to be able to adopt higher-level technology and other production related resources such as human capital, skills and management. It is much harder for domestic firms to be able to compete in the export sectors as shown in the data since the main domestic firms development is at the level of the small-scale enterprises. Moreover, the horizontal linkages with export-oriented foreign firms produce positive export spillovers to the domestic firms, while domestic-oriented foreign firms discourage the domestic firms from exporting (Anwar and Nguyen Phi Lan, 2011). On the other hand, the domestic firms benefit from the backward linkages from both export-oriented and domestic-oriented foreign firms but the gain from linkages with the latter is bigger. It seems that as exports-oriented foreign firms are a part of global sourcing and distribution networks, they usually require higher quality requirements on the inputs. The domestic firms that meet the standard could be fewer and thus the technology spillovers effect from export-oriented foreign firms is likely to be smaller than domestic-oriented foreign firms (Hoi and Pomfret, 2011). Thus, export-oriented foreign firms produce export spillovers effect but they contribute less in the technology transfer, which is an important factor in developing the domestic firms in

order for them to reach the level at which they could participate in the exports sector. It seems to be the case that the positive exports spillovers effects from foreign firms is limited and without the carefully crafted support program from the government, it is hard for the domestic exports sector to be competitive at the international level and to compete with the foreign firms. This again shows the importance of the spillovers effects of FDI; when the spillovers effects are small, it is harder for the domestic firms to be developed in a relatively shorter amount of time.

Anwar and Nguyen Phi Lan (2011) also suggest that Vietnam needs a better export promotion program since new firms that want to enter export market face competition from existing firms both domestic and foreign. Moreover, they have to bare the significant sunk-costs such as the cost of product promotion, the cost of establishing contacts with potential clients and costs related to the product development. The positive export spillovers effect from linkages with foreign firms is present but the negative effect caused by sunk cost of exporting is much higher and thus lowering the sunk costs could boost Vietnamese firms' competitiveness at the international level. Some activities that the state could engage to reduce sunk costs are allowing the domestic exporters grants for renting capital, training, R&D, technology acquisition, subsidies, etc. (Gorg, Henry and Strobl, 2008).

4.2.4 Regional Spillovers Effect

Regional spillovers effects could be observed in several papers. The backward linkages effect is mostly observed in four main economically prosperous regions: Red River Delta, North East, South Central Coast, and South East. These are the regions where most of the imports and exports activities are taken place and have better infrastructure, skilled labour force and technology and 80% of foreign firms are located in these regions (Nguyen Phi Lan, 2008). In 2016, 73% of enterprises are located in South East and Red River Delta region where major cities such as Ho Chi Minh and Hanoi are located, followed by the North Central and Central Coastal areas holding 12.6% of total enterprises (GSO, 2017).

The geographical spillovers effect of foreign firms also exists in export spillovers to domestic firms. The spatial concentration of foreign firms presence in a region increases the probability of the domestic firms to start exporting and also the export share of domestic firms in the same region (Anwar and Nguyen Phi Lan, 2011). However, the negative competition effect also presents alongside the positive spillovers effects of the backward linkages and

technology transfer. Relatively more remote regions do not enjoy the benefit of backward linkages yet they do not have setback from competition effect either, and they still gain from the horizontal linkages with foreign firms through better production technique and technology (Nguyen Phi Lan, 2008). According to the data, the positive spillovers effects more than offset the negative competition effect and thus firms decide to stay in the major economic zones.

4.2.5 Wage Spillovers Effect

The contribution of FDI in the job creation and employment is well known and now it is found that FDI also helps in raising the local wage level through wage spillovers effect. The average monthly wage in both domestic and foreign firms increases tremendously between 2005 and 2016 as shown in table – 2, the increase is more than 5 times for the former and 4 times for the latter. The domestic firms benefit from both horizontal and vertical wage spillovers effect from foreign firms (Hoi and Pomfret, 2010). Horizontal wage spillovers effect is observed and distinctive in low- and medium-tech industries and in all firms regardless of the size. Vertical wage spillovers effect is observed in domestic firms that engage in backward linkages with foreign firms as the productivity gain through spillovers allows them pay higher wages. This effect is only applicable in the low technology industries and small and medium sized firms. In order to benefit from the vertical spillovers effect, domestic firms need to provide training, and it signals that foreign firms choose to work with the domestic firms with better quality who have training commitment. The horizontal spillovers effect is enjoyed by domestic firms with or without training and it seems to be through the competition to attract good and skilled workers. Even though the wage level in both domestic and foreign firms increases, the average wage in foreign firms is still higher than that of domestic firms in 2016 (table – 2). This could be due to the fact that average wage level is positively associated with the education level, capital intensity and scale as found in Hoi and Pomfret (2010). The foreign firms are larger in scale and also relatively more capital intensive and most likely to demand skilled workers.

In the regional average wage level, the South East region offers the highest average wage that is comparable to the average wage level of foreign firms. It is due to the fact that many foreign firms are concentrated and cause the great wage spillovers effect in that region since the major economic hubs including Ho Chi Minh city are located in that region. The red river

delta and Northern midlands areas are also the regions where industries prosper. The technology gap is smaller where the industries are more developed, as technology spillovers effect is greater. The larger the technology gaps between the domestic and foreign firms, the smaller the wage spillovers (Hoi and Pomfret, 2010) since the firms will not compete to recruit the same level of workers in the horizontal spillovers case. For vertical spillovers effect, the backward linkages would be smaller as the technology gap is too big and thus domestic firms could not fulfil the demand from foreign firms. That explains the disparity in regional wage level as the wage level is higher where the wage spillovers effect is greater.

Table 2: Average compensation per month of employees in enterprises by types of enterprise

Thousand Dongs	2005	2010	2016
Domestic firms	1238	3420	6405
Foreign firms	1810	4252	8504
Regional data			
Red River Delta	1600	4215	7281
Northern midlands and mountain areas	1188	2955	6799
North Central and Central coastal areas	1218	2789	5521
Central Highlands	1258	3027	5159
South East	1822	4422	8255
Mekong River Delta	1275	2736	5843

Source: GSO

4.3 Impacts of FDI – Summary and Discussion

If the spillovers effects of FDI were not present, FDI would mainly contribute to the capital formation and facilitate the economic development to certain extent such as the higher productivity and GDP; however, the contribution to the sustainable development in the long term would be limited. It would be difficult for the domestic firms to be developed quickly in a relatively shorter amount of time without the spillovers effects from foreign firms. Vietnam's low-tech industry flourishes more compared to the medium- and high-tech industry and this seems to be in accordance with the current endowment structure of Vietnam. The impacts of spillovers effects from foreign firms on the development of the domestic low-tech industries seems to be huge as this pattern is observed in the development of the medium- and

high-tech domestic sectors as well since the number of domestic firms increases following the rise in the number of foreign firms. However, the rate that these sectors grow also depends on the absorbability of local firms, the availability of the technology and the support from the government such as infrastructure, policies, regulations and efficient allocation of resources.

The results from the previous session also indicate that the continuous and better support from the government is required for the further development of the higher-level industries and the exports sector. As the study shows that the backward linkages with fully foreign-owned firms are much lower than that of the joint ventures; thus the chance for technology and skill transfer is also smaller. The increasing share of fully foreign-owned firms between 2000 and 2016 as foreign firms increase the investment in high-tech level industries seems to point out that the high-tech foreign firms establish themselves as fully foreign-owned firms in order to keep the technology to themselves and the technology transfer would be more difficult. Another problem is the technology gap between the domestic and foreign firms would make it more difficult for the technology and skills spillovers effects to be triggered. In this case, the support of the government such as policies and R&D funding would be all the more crucial in developing the high-tech industries. OECD (2018) also advises Vietnamese government to focus on strengthening the performance and competitiveness of small and medium enterprises (SMEs) by supporting SMEs in building their absorptive capacities with industry-specific measures and increasingly involving the private sector in human resource development policies and training in order to progressively reduce the production gap between domestic SMEs and foreign enterprises.

Another case of requiring more attention from the government is in the domestic exports sector where the growth has been very lukewarm. As only large scale domestic firms with high capacity are likely to survive in the exports sector and it seems that the relatively more mature low-tech domestic sector benefits from the exports spillovers effect. The spillovers effect from the export-oriented foreign firms to the growth of the domestic exports industry does not seem to extend to the medium- and high-tech domestic sectors that are still at the early stage of development. The further development again needs the support from the government to facilitate more in areas such as reducing sunk costs, exemption or lower tax for the new domestic firms and other policies and incentives. This also brings in the issue of export-oriented foreign firms produce less technology transfer compared to the domestic-oriented foreign firms, who have more backward linkages with the local firms. The lower

chance of backward linkages with export-oriented firms might be due to the export-firms' requirement of higher quality inputs; this problem could be solved when the domestic firms improve the quality of their products through the longer production experience of the firms, the improved skills of the workers and the better technology. This brings back to the reducing the production gap between the foreign and domestic firms mentioned before. When the quality of the domestic firms is improved, the spillovers effects from the export-oriented foreign firms have the potential to be bigger than the domestic-oriented ones.

OECD has advised Vietnamese government to involve the private sector more in human resource development and human capital, especially industries-specific skills are crucial in industrial upgrading process. Theoretically, it is easy to see that FDI could bring in the skills and knowledge spillovers effect but it is hard to distinguish this spillovers effect in the empirical data. It is difficult to measure and mostly observed through the improvement in overall productivity and labour productivity of domestic firms but the impact of skills transfer is not possible to extricate from that of the technology transfer as they are interrelated with each other. One indirect signal that can be observed is the increasing wages of the workers. Since the increasing wages indicates the improved skilled workers, it could be seen through the wage spillovers effects. Especially, the presence of the vertical wage spillovers effect found only in domestic firms with training commitment indicates that only the firms with higher quality benefit from the wage spillovers and in order to improve the quality of the product, both technology and skilled workers are required. So, the presence of this wage spillovers effect indicates the skills transfer through linkages.

When we look at the different spillovers effects observed in Vietnam, the growth of the domestic firms needs to be at a certain standard to benefit from the spillovers effects. In order to develop the industries to the standard where they would benefit from the spillovers effect, joint ventures might be the easiest method or the government could help in developing, disseminating and creating opportunities to acquire the technology, knowledge and skills required for the further development of the industries. The technology and wage spillovers effects are more concentrated in areas with good infrastructure, better work force and technology. For the government to develop the less developed regions in consideration of mitigating the poverty and inequality, which will have big impacts for the long-term sustainable development, they need to focus on the providing the necessary infrastructure and industrial policies. OECD (2018) also encourages Ministry of Planning and Investment (MPI)

to carry out more effort in directing FDI into poorer provinces through more coordinated investment promotion activities.

All in all, it is evident that spillovers effects of FDI contribute significantly to the sustainable development of Vietnam. The technology transfer and backward and forward linkages spillovers effects contribute to the development of the domestic industries and raise the overall production level; which leads to higher GDP and capital accumulation. This leads to the improved endowment structure and facilitate the industrial upgrading process. Even if the foreign firms left Vietnam, the already established domestic firms would remain with the technology and the knowledge, unlike the real estate sector. The competition effect of FDI also encourages the domestic firms to improve their quality and competitiveness and increases the overall level of competition in the domestic market. On the other hand, export spillovers effect increases the competitiveness of domestic firms in the global market. The wage spillovers effect helps increase the income level of the domestic firms and workers. Although, the sustainability of the level of wages also depends on other factors such as labour market condition and the demand in the market, it is most likely to be sustained with the continuous development of the industries. The indirect impact of the higher income level of the households and the GDP is the improvement in the human capital. As discussed in the theoretical session, the combination of the higher return to education and increased income encourages individuals or households to invest in education. The higher GDP means higher tax level and the extra income for the government allows them the choice of increasing the spending on education. Especially, if the higher education would lead to higher return at the nation level, the government is more likely than not to be persuaded to invest in cultivating the human capital. When regional spillovers effects also encourage the government to develop the infrastructure in less developed regions and these in turn attracts more invest to the region and leads to the sustained cycle of development. The sustainable development induced by the spillovers effects of FDI are present but the support and facilitation of the government is also crucial for the industries to further develop and some of the main actions taken by the Vietnam government will be briefly discussed in the following session.

4.4 Role of Government and Development of Industries

Since Doi Moi reform started in 1986, Vietnam has been striving to transition from a centrally controlled economy to market-oriented economy. This reform emphasises on the development of the private sector, reducing the role of state-owned enterprises, encouraging the export-promotion, trade liberalisation, catching up on industrialisation and encouraging FDI. Vietnam's attempt to invite and attract FDI started with 1992 new constitution encouraging foreigners to invest capital and technology, guaranteed the rights and business opportunities and protected from being subject to nationalism by the constitution (Article 25). The Law on Foreign Investment in 1987 and the Law on Private Enterprises in 1990 act as the paving road for foreign companies to operate in the joint state-private venture or wholly foreign-owned enterprises and are allowed to invest in any sector. But there was a long list of restriction for investing in certain sector and only limited liability and joint-stock companies were allowed. An open door policy is adopted for the foreign trade to expose the domestic market to the world markets and foreign competition (Van Arkadie and Mallon, 2003).

The success of the effort of modifying laws and regulations to attract FDI have been lukewarm even though it rose significantly since 1991, the real breakthrough seems to come in 2007 (figure – 6) when Vietnam becomes a member of World Trade Organisation. Before that, there are a few important changes in investment related law. In 2005, three important laws are enacted: 1) the Unified Enterprise Law, which applies to enterprises of any type of ownership; 2) the Common Investment Law for both foreign and domestic investment; (OECD, 2018:25-27) and 3) the Competition Law that prohibits unfair practices by the government (Anh, 2014). Even though there are some fluctuations, FDI inflow takes on a totally different level since 2007 and it is consistently on the rising trend from 2013 onwards. The latest report from GSO states that the increase in implemented FDI in 2017 reaches approximated 17.5 billion USD, that is an increase of 10.8% from previous year and the highest amount the economy has achieved so far. The contribution of the foreign invested sector to GDP and employment reaches 18.5% and 7.8% respectively in 2017. (GSO, 2017)

To further facilitate the foreign investment, the investment promotion and facilitation activities are carried out at both central and provincial levels. Foreign Investment Agency (FIA) is specially established under Ministry of Planning and Investment (MPI) and being responsible for making FDI related policies as well as the implementation including

promotion, facilitation and creating the investment-friendly environment (OECD, 2018). The policies encourage the foreign investment towards the direction of industrialisation, especially the export-oriented industries and infrastructure development industries (MPI, FIA).

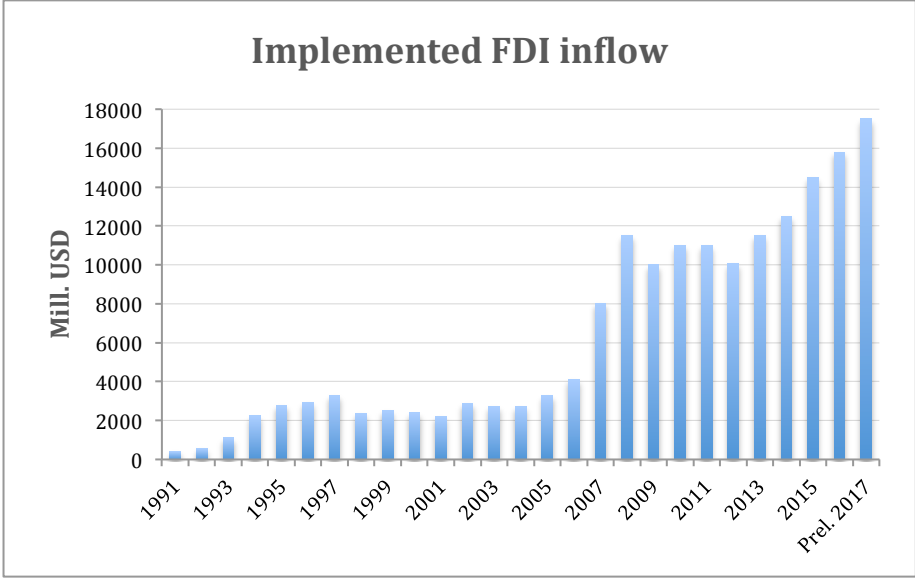


Figure 6: FDI inflows in Vietnam at national level (1991-2017, mill. USD)

Source: GSO

However, the FDI favoured policies and regulations alone will not bring in the investment in the long run. The rise and fall of FDI inflow is closely correlated with the growth level of the industry of an economy as indicated with the fourth arrow in the analytical framework. For FDI inflow to increase, there have to be industries or markets to invest in. As discussed before, the share of small and medium size foreign firms is much higher back in 2005 compared to 2016. Without the adequate development level of facilities such as infrastructure, human capital or market, it is difficult for foreign firms to operate high-tech firms even if they could bring the required capital investment and technology.

Therefore, foreign firms start out with low-tech firms where production is labour intensive and take advantage of the cheap unskilled labours available. When domestic firms are developed with the support of the government’s policies and spillovers effects from foreign firms, the industry is upgraded further. With better infrastructure and human capital in the more developed economy, foreign firms’ investment in medium- and high-tech industries increases. As can be seen in the following table – 3, the average capital size in the manufacturing firms with different technology level increases throughout the period of 2010 to 2016. The increase in average capital size among three different level firms holds a big gap

and the increment is the higher the more advanced the technology of the firm is. Thus, the more developed the industry is, the greater the chance of foreign firms investing in high-tech sector that could lead to the higher FDI inflow. As can be seen in the table – 3, even though the number of low-tech firms is the highest and it is the lowest in high-tech sector, the number is reversed in the average capital size. Hence, it is important to climb up the comparative advantage ladder in order to attract more FDI and reap the benefits that come with it.

Table 3: Average Capital Size of Manufacturing Firms with different level of Technology

Average Capital size (Bill. Dongs)	2010	2011	2012	2013	2014	2015	2016
High-tech firms	69.3	79.9	87.8	129.3	149.8	170.9	181.2
Medium-tech firms	52.5	49.0	49.9	64.2	67.7	73.7	72.5
Low-tech firms	39.2	42.1	44.4	41.1	44.2	48.8	49.8

Source: GSO 2017

Hard Infrastructure

To attract FDI and to develop the industries as well as the economy as a whole, it is crucial to provide the adequate level of infrastructure, both hard and soft. As the industries upgrade from one level to another, the level of infrastructure needs to be improved to facilitate the upgrading process. Vietnamese Academy of Social Sciences (2006) shows that an additional 1% of GDP spent on infrastructure is associated with 0.5% poverty reduction rate, with larger impact in poorer provinces. As Vietnam’s industries expand its manufacturing production and higher value-added goods are traded and consumed, the failure to meet the infrastructure connectivity requirement becomes more costly (World Bank, 2014). Improving the infrastructure connectivity could also increase Vietnam’s participation in global value chains. Portugal-Perez and Wilson (2010) estimate that improving Vietnam’s physical infrastructure to the level of Malaysia could result in 30% exports boost. Moreover, Stone et al. (2012) state that due to the links with China, Vietnam’s GDP could increase by 3.6% if the regional road connectivity and trade facilitation are improved. OECD (2018) states that the infrastructure development is not keeping pace with the exports sector growth and preventing Vietnam from participating in the higher-value added global value chains. World bank (2014) also mentioned that lack of the quality in the infrastructure networks blocks more investment to come in and achieving more economic growth.

These studies show that Vietnam's industries are expanding and developing into the next phase or have the potential to do so. Unlike in the analytical framework where one developmental stage jumps decisively to another when the conditions are fulfilled, the actual process is continual and there will always be a period when all the necessary conditions are not present for the industries to upgrade. For instance, the physical capital as a part of the endowment structure fulfils the requirement to upgrade the industries yet human capital level or infrastructure development is lacking. In this case, the industrial upgrading will still happen without achieving the full potential at competitiveness or gaining highest level of capital surplus. For the full completion of this level of industrial development, the human capital and infrastructure or other necessary conditions will have to catch up. This cycle will go on every time the industrial upgrading occurs until it reaches the fully developed stage. This seems to be the case with Vietnam's infrastructure requirement; there are potential for the current industries to further develop but infrastructure development needs to keep up.

Any kind of infrastructure development involves a large sum of capital investment and high-level implementation plan; thus the new structural economics suggests the country's state to take the leadership in this part. Vietnamese government has been paying attention to this and taking various actions. The government estimated the cost for the investment required for the new and improved infrastructure and related services for the period of 2011-2020 is around 170 billion USD. This is an ambitious plan as well as a challenging one, however the payoff from the successful implementation can be large. (OECD, 2018: 294) Vietnam increased investment in infrastructure after 2008 as a part of economic stimulus (Abidin, 2010) but still needs more investments. The government has been taking actions to increase the private sector investment in the infrastructure by setting up regulatory framework to implement the public-private partnership (PPP) in 2015 (OECD, 2018). This regulation together with the new Law on Public Investment enacted in 2014 aims to increase the capacity to support the improvement of the infrastructure. It will take some time for Vietnamese government to implement the regulations but the state is putting in a lot of efforts to gain more investment for the better infrastructure. Vietnamese government is improving soft infrastructure in terms of regulations, laws and institutional aspects, in order to support the tangible infrastructure required for the further development of the industries and economic growth. From this aspect, Vietnam is adopting recommended principle from the new structural economics in facilitating the necessary infrastructure for the further development of the economy.

5 Conclusion

Vietnam seems to overcome the development stage-1 of Ohno's industrialisation process and transitioning into stage-2 based on the development pattern of its manufacturing industries and domestic firms. The low-tech industry grows tremendously and the sky-high number of small enterprises seems to indicate the successful development of the early stage of industrialisation. The FDI inflow has been increasing and more than half of it goes to manufacturing sector and the second highest amount flows into the real estate sector. But FDI's contribution to the employment of the domestic market mainly lies in the manufacturing sector as expected. The various spillovers effects are very likely to contribute to the high growth of low-tech domestic firms. As the foreign firms focus on the low-tech industry at the beginning of the development process and have been settled in the local market for some time, the backward linkages are formed and a better supply network with the domestic firms seems to be established. Through this network of backward linkages with the foreign firms, the main technology diffusion and skills and knowledge transfer are taken place. The similar development pattern is observed for the medium- and high-tech sectors and thus the spillovers effects of FDI play an important role for the development of the domestic industries and in accelerating the process.

The foreign firms' contribution to Vietnamese export sector is to the point of dominating it and the domestic exports sector barely progresses in the past few years. This is also in line with Ohno's industrialisation stage-2 where there are developments in the domestic sectors in quantity but foreigners still dominate. The domestic firms need to upgrade in terms of production quality in order to be able to compete in the international market and with the strategic support from the government such as tax exemption, policies to promote the domestic firms and some other incentives, there may present an opportunity for the domestic exports sector to catch up in the near future. Since there is the spillovers effect from FDI observed in the exports sector, it has the potential to grow more when the necessary level of hard and soft infrastructure is in place.

The infrastructure improvement is certainly very crucial in developing industries not only for the exports sector but also to attract FDI regionally since the regional spillovers effects are

observed in the areas with the better infrastructure. The foreign firms seem to settle in the regions with good infrastructure and then pull in the skilled work force, thus the spillovers associated with technology, skills, knowledge, competition and wage are greater in these regions. The number of firms and the average capital size of low-, medium- and high-tech manufacturing industries have been increasing over the period and this shows the continuing growth of the industries and Vietnam is climbing up the comparative advantage ladder gradually. More studies should be conducted regarding the spillovers effects of FDI on the medium- and high-tech sectors when those sectors are more mature.

In terms of the support from the Vietnamese government, it has been putting in a lot of efforts in providing both soft and hard infrastructure such as amending/enacting laws to accommodate more FDI and the development of domestic industries and laying out plans and implementing the hard infrastructure to facilitate the next level of industrial development. All in all, the role of FDI in the development of Vietnam's industry seems to be significant through various spillovers effects. The industrial development pattern also follows the economy's endowment structure with low-tech industry being developed first and then medium- and high-tech sectors following in the development path. There are the signs of Vietnam's industrialisation transitioning into the next stage but the infrastructure and endowment structure requirements need to be fulfilled in order to achieve it. When the low-tech industries are fully developed and both physical and human capitals are improved, Vietnam would be able to continue to upgrade its industries and benefit from various spillovers effects including the technology transfer and diffusion in the development of the medium- and high-tech industries since its development level is still far from the global frontier. The paper finds the positive and seemingly significant correlation between the spillovers effects of the FDI and the development of the domestic industries and the importance of role of government in industrialisation process. The paper covers broader aspects of spillovers effects on the general development of the domestic industries that it lacks the deeper analysis of the size of impacts of each spillovers effect. This could be further analysed in detail by focusing on the specific spillovers effects and the development of relevant industries in the future studies.

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Appendix

Appendix 1: Accumulation of FDI projects licensed and total registered capital by type of economic sectors (Effective as 31/12/2017)

Type to Economic Sectors	Number of projects	Total registered capital (Mill. USD)*	Total registered capital (%)
Manufacturing	12460	186514	58.36
Real estate activities	639	53226	16.65
Electricity, gas, steam and air conditioning supply	115	20821	6.51
Accommodation and food service activities	644	12004	3.76
Construction	1481	10847	3.39
Wholesale and retail trade; Repair of motor vehicles and motorcycles	2805	6200	1.94
Mining and quarrying	105	4876	1.53
Transportation and storage	666	4647	1.45
Agriculture, forestry and fishing	511	3521	1.10
Information and communication	1653	3337	1.04
Professional, scientific and technical activities	2478	3096	0.97
Arts, entertainment and recreation	133	2782	0.87
Water supply, sewerage, waste management and remediation activities	68	2339	0.73
Human health and social work activities	134	1867	0.58
Financial, banking and insurance activities	81	1488	0.47
Other service activities	156	763	0.24
Education and training	376	760	0.24
Administrative and support service activities	298	527	0.16
TOTAL	24803	319613	100

(*) Including new registered capital and supplementary capital to licensed projects in previous years. Since 2016, contributing capital and purchasing shares of foreign investors are included.

Source: GSO

Appendix 2: Number of Enterprises by size of Capital

Number of Enterprises by size of Capital							
Year	Total	Billon Dongs			Percentage (%)		
		< 50	50-200	> 200	< 50	50-200	> 200
State owned enterprise							
2016	2662	804	701	1157	30.20	26.3	43.5
2010	3283	1350	945	988	41.12	28.8	30.1
2005	4086	2278	1121	687	55.75	27.4	16.8
Non-State enterprise							
2016	488395	460832	19836	7727	94.36	4.1	1.6
2010	280762	267966	9625	3171	95.44	3.4	1.1
2005	105167	103487	1388	294	98.40	1.3	0.3
FDI enterprise							
2016	14002	8257	3101	2644	58.97	22.1	18.9
2010	7254	4429	1674	1151	61.06	23.1	15.9
2005	3697	2485	793	419	67.22	21.4	11.3

Bill. Dong: 50 = 2.1 million USD. approx., Bill. Dong: 200 = 8.4 million USD. approx.

Source: GSO

Appendix 3: Types of Manufacturing firms and Number

Types of Manufacturing firms	2000	2005	2010	2016
Manufacture of food products	3485	3466	4977	7137
Manufacture of beverages		762	1711	2291
Manufacture of tobacco products	24	25	26	23
Manufacture of textiles	408	908	1862	3150
Manufacture of wearing apparel	579	1609	3992	6413
Manufacture of leather and related products	258	499	1096	1908
Manufacture of wood and of products of wood and cork	742	1638	3362	4676
Manufacture of paper and paper products	386	932	1673	2448
Printing and reproduction of recorded media	270	1157	3362	5601
Manufacture of coke and refined petroleum products	11	25	73	124
Manufacture of chemicals and chemical products	410	872	1732	3370
Manufacture of pharmaceuticals, medicinal chemical and botanical products	44	198	289	484
Manufacture of rubber and plastics products	467	1323	2856	5040
Manufacture of other non-metallic mineral products	1104	1752	2963	4482
Manufacture of basic metals	116	421	858	1174
Manufacture of fabricated metal products	623	2403	6535	13065
Manufacture of computer, electronic and optical products	3	257	613	1399
Manufacture of electrical equipment	258	501	922	1380
Manufacture of machinery and equipment n.e.c	237	464	1006	1723
Manufacture of motor vehicles; trailers and semi-trailers	177	232	318	491
Manufacture of other transport equipment	265	460	637	737
Manufacture of furniture	527	1300	2619	4172
Other manufacturing	5	453	1241	1745
Repair and installation of machinery and equipment	-	219	749	2318
Total	10399	21876	45472	75351

Source: GSO

ⁱ The number of the foreign firms in terms of technology level is not available, hence average capital size is used to categorise. The average capital size of different tech-level manufacturing firms is calculated and the total foreign firms are divided according to this average capital size.