

EDITOR IN CHIEF

DINH VAN SON

DEPUTY EDITOR IN CHIEF

SECRETARY OF EDITORIAL OFFICE

PHAM MINH DAT

EDITOR IN ENGLISH

NGUYEN THI LAN PHUONG

EDITORIAL SCIENTIFIC COUNCIL

Dinh Van SON - Thuong mai University, Vietnam - President

Pham Vu LUAN - Thuong mai University, Vietnam - Vice President

Nguyen Bach KHOA - Thuong mai University, Vietnam - Deputy President

THE MEMBERS

Vu Thanh Tu ANH - Fulbright University in Vietnam, USA

Le Xuan BA - Centural Institute for Economic Managerment, Vietnam

Hervé B. BOISMERY - University of La Reunion, France

H. Eric BOUTIN - Toulon Var University, France

Nguyen Thi DOAN - Vietnam Learning Promotion Association, Vietnam

Haasis HANS - Dietrich - Institute of Shipping Economics and Logistics (isl) Bremen - Germany

Le Quoc HOI - National Economic University, Vietnam

Nguyen Thi Bich LOAN - Thuong mai University, Vietnam

Nguyen Hoang LONG - Thuong mai University, Vietnam

Nguyen MAI - Vietnam Economist Association, Vietnam

Duong Thi Binh MINH - University of Economics HoChiMinh City, Vietnam

Hee Cheon MOON - Korean Trade Research Association, South Korea

Bui Xuan NHAN - Thuong mai University, Vietnam

Luong Xuan QUY - Vietnam Economicst Association, Vietnam

Nguyen Van Song - Vietnam National University of Agriculture

Nguyen TAM - California State University, USA

Truong Ba THANH - University of Danang, Vietnam

Dinh Van THANH - Institute for Trade Research, Vietnam

Do Minh THANH - Thuong mai University, Vietnam

Le Dinh THANG - University of Québec à Trois Rivières, Canada

Tran Dinh THIEN - Vietnam Institute of Economics, Vietnam

Nguyen Quang THUAN - Vietnam Academy of Social Sciences, Vietnam

Le Nhu TUYEN - Grenoble École de Managment, France

Washio TOMOHARU - Kwansei Gakuin University, Japan

Zhang YUJIE - Tsinghua University, China

Journal of Trade Science

ISSN 1859-3666

Volume 9

Number 2

June 2021

CONTENTS

Page

1. **Trang, T. T. T.** - The impact of working capital management on the financial performance of manufacturing companies: a context of plastic companies in Vietnam 3
2. **Viet, N. H. and Duc, D. L.** - A research on the Impact of Organizing Strategic Market Implementation on Business Performance of Hanoi Trade Corporation 10
3. **Thao, T. V. and Huyen, V. T.** - The Impacts of Linkages on the Development of Vietnam's Supporting Industry in the Context of the Covid-19: Approach to the Inter-Sector Balance Sheet Method 26
4. **Huyen, L. T.** - The Impact of Internal Factors on the Profitability of Listed Food Producing Companies in Vietnam 39
5. **Nhan, N. T. T. and Duong, V. T.** - A study on student satisfaction in tourism industry-specific training programs 48
6. **Hieu, H. M.** - Study on Factors Affecting the Choice of Logistics Service Provider of Vietnamese Customers in the Covid-19 Discussion Period 61
7. **Toan, D. V.** - Spin-offs Academic Enterprise from Universities Around the World and the Problems Posed to Vietnam's Higher Education 70
8. **Uyen, N. T. U. and Niem, L. T.** - The Impact of Diversification on Idiosyncratic Risk of Listed Companies on Vietnam Stock Market 83
9. **Linh, N. P. and Khanh, C. T.** - The Relationship of Absorption Capability, Cross-Channel Integration Capability and Firm Performance of Retail Enterprises 97
10. **Nhung, D. T. H.** - Studying the Effect of Goodwill on the Market Value of Companies Listed on Vietnam's Stock Market 108

THE IMPACTS OF LINKAGES ON THE DEVELOPMENT OF VIETNAM'S SUPPORTING INDUSTRY IN THE CONTEXT OF THE COVID-19: APPROACH TO THE INTER-SECTOR BALANCE SHEET METHOD

Tran Viet Thao

Thuongmai University

Email: tranvietthao@tmu.edu.vn

Vu Thanh Huyen

Thuongmai University

Email: thanhhuyenvu86@gmail.com

Received: 8th September 2020

Revised: 21st December 2020

Approved: 7th January 2021

The research paper takes into consideration the role of promoting the linkage of the supporting industry (SI) of Vietnam in the context from the end of 2019 up to now, the world and domestic economies are suffering from severe impact from the Covid-19 pandemic. In order to push back the challenges, the development of supporting industries will be of utmost importance in promoting the connection between domestic SI businesses and assembly enterprises, FDI enterprises... to improve the localization rate then enhance the added value of the product and enhance the competitiveness of the product and the economy... Based on the inter-sector balance sheet (I/O) approach, the article identifies the coefficients of the link between the SI and other manufacturing industries in the economy and the whole economy. On these bases, the conclusion of the article shows that the SI has an important role as the leading supply sector, entering the manufacturing industries in the economy and promoting linkages will be of great significance in the process of developing the industries of Vietnam in the pandemic.

Keywords: supporting industry, backward linkages, forward linkages, I/O sheet, Covid-19.

JEL Classifications: D22, D50, D51

1. Problems

Since the end of 2019, the Vietnamese economy in general and sectors in the economy in particular are facing many challenges due to the negative effects from the Covid pandemic. In the early 2020 period, the processing and manufacturing industries (P&MI) of Vietnam were also affected by the shortage of imported parts and accessories for production due to the impact of pandemics from countries that are experiencing outbreaks. Along with that is the decline in the demand for export of industrial prod-

ucts, ... causing the growth of the whole industry to decline seriously... Thus, to limit the negative effects from the pandemic, developing the domestic supporting industries is very important, thereby promoting the integration within the industry, as well as the economy as a whole; increasing the localization rate, reducing the cost of intermediate goods, as well as improving the competitiveness and added value of exports... Besides, the development of supporting industries also promotes the process of technology improvement, improving the productivity of other

factors, attracting FDI... Developing SI will create a spillover effect on other economic sectors. The analysis of the linkage effects of the development of Vietnam's supporting industries will be the necessary basis for the formulation and implementation of policies for development of supporting industries in the context of a complicated epidemic in the world

2. Some theoretical basis and research model

2.1. Some related theoretical basis

Definitions

Supporting industry (SI) in a collective meaning is understood as the production of intermediate products for the main production process such as preliminary processing of raw materials or manufacturing a part of similar main products according to technical standards. Or in more specific meaning, "Supporting industries are a group of industrial activities that provide intermediate inputs (including components, parts and tools to make spare parts) to the processing and assembly industries" (Thuy, 2007); (Mori, 2005). In the scope of this study, the authors choose to approach SI in a specific meaning. Accordingly, supporting industries are industries that produce basic materials, components, spare parts, and semi-finished products to supply assembly industries such as automobiles, motorcycles, electricity, electronic...

Industrial linkage: In a narrow meaning, industrial linkages can occur when one producer buys inputs to produce goods or services or sells them to another. In a broad meaning, industrial linkages include all cooperative activities, including material and information flows, between individual elements and production system functions. Industrial linkage is a combination of products that flow from factories, to retailers, wholesalers, to the general public, as well as to other manufacturers (Dobson, 1984).

Industrial linkages can take place vertically and horizontally. In particular, the vertical linkage takes place along the production line of a product, from the supply of raw materials and equipment to the supply to the market. Enterprises participate in vertical linkage to create a value chain to help improve the competitiveness of an industry. Vertical linkages include forward linkages, also called upstream links, when the product of one business is the input of another, and a backward linkage or downstream link

in circulation and consumption. Horizontal linkage occurs when a number of businesses work together to receive a large order beyond the capabilities of one business (Liem).

Thus, the object of the linkage in industrial production in general is the enterprises participating in the production process, including: assembly enterprises, P&MI or the linkages between domestic enterprises, FDI enterprises and multinational corporations... From there, it can be understood that the objects receiving the impact from the linkage of industrial development industry will include all enterprises engaged in real estate processing and manufacturing industries: from supplying supporting industries such as raw materials, accessories... to producing finished products and supplying them to the market.

The impact of the Covid epidemic on the development of supporting industries:

Definition of the Covid-19 pandemic: The World Health Organization (WHO) explains that Coronaviruses (Cov) is a virus that infects the respiratory system, Corona virus causes the common cold to more serious illnesses such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). Corona virus is transmitted from animals to humans. The development of the COVID-19 case in Wuhan began on December 30, 2019 when the Wuhan Municipal Health Commission issued the announcement "urgent notification of the treatment of unexplained pneumonia". Corona virus spreads rapidly, even between countries. So far 188 countries have confirmed the Corona virus. The spread of the Corona virus has spread to many parts of the world having impacts on economies, including production, trade, investment and tourism.

From the definition of Covid-19, we can conclude how dangerous Covid-19 is, it spreads easily and spreads so quickly that it can infect almost any country anywhere in the world.

Impacts of the Covid-19 epidemic on the supporting industries:

In terms of economy, the shock caused by the Covid-19 pandemic had a great influence on the whole economy in general due to the decline in both the supply and demand side, for the supporting

industries, the impacts can be seen in the following major aspects:

(i) On the supply side, the supply has decreased due to the slowdown in production and business, the rising costs... due to the shortage and disruption of labor, raw materials, and credit capital to implement the restricted movement policy, isolation and other disease treatment, prevention and avoidance measures (Sulistiyani & Riyanto, 2020); (Sodhi, 2020).

(ii) On the demand side, demand (consumption demand) also decreased sharply due to increased costs and the market felt the level of risk increased with reduced income (due to unemployment, reduced employment...) (UNIDO, 2020); (Sulistiyani & Riyanto, 2020); (Sodhi, 2020)

The above impacts have spread globally due to the openness, integration and globalization of economies, especially in the financial and trade sectors. Export of industrial products in general and supporting industries in particular has declined due to the breakdown of global production and supply chains. At the same time, FDI attraction activities are also severely disrupted due to the impact of epidemics (UNIDO, 2020).

The linking role of the supporting industry to economic growth and development in the context of a pandemic

Firstly, the role of national competitive advantage: According to (Porter, 2012), the supporting industry is one of the four factors that determine a country's competitive advantage. The existence of ***internationally competitive*** supporting industries within a country creates linked advantages for industries to use outputs for proactive integration. Details as following:

(i) By accessing most of the available inputs from the supporting industry, the industry will profit effectively, quickly and sometimes with incentives.

(ii) The supporting industry creates an advantage through continuous coordination in the use of machines and other inputs. The SI has the ability to create links between companies in the value chain and their suppliers.

(iii) SI creates a process of innovation and improvement through the work linkage between supporting goods suppliers and manufacturers. Providers help companies know new methods and have the

opportunity to adopt new technology. Companies were given quick access to information, new ideas and knowledge, and supplier inventions. They influence suppliers' technical efforts as well as become testers for product development. The exchange of R&D activities and participating in solving problems leads to faster and more effective solutions. Providers also tend to be a channel for transferring information and inventions from company to company. Through this process, the speed of invention in the entire domestic industry was accelerated.

Secondly, the role of promoting linkages of the supporting industry contributes to the long-term growth of the economy, especially in the context of a pandemic creating disruptions to global production and supply chains. by (i) attracting and maintaining FDI for the final assembly industry for longer than a country without a competitive industrialization industry; (ii) products of the supporting industry supplied to domestic production and assembly enterprises and exported to countries where the final assembly industry is in demand; (iii) the development of the supporting industry will create a positive effect in promoting technology innovation for all types of enterprises participating in the production chain, thereby improving the welfare of a country (Chau, 2010).

Thirdly, the linkage role of supporting industries contributes to improving the competitiveness of industrial export products, helping industrial production to be proactive in the context of epidemics. The development of domestic supporting industries will promote links between "upstream" and "downstream" enterprises, between domestic enterprises and multinational corporations, transnational corporations...; help reduce production costs by improving localization rates and help assemblers with FDI to expand production. In addition, the close linkage between the parties will create a stable supply of quality inputs, thereby helping to ensure the delivery ability for businesses in the main industry (Binh, 2010).

Fourthly, the leading role of FDI inflows. The concentration of components and accessories industry will facilitate investment in foreign assemblers. This is especially important in the context of an ongoing pandemic. A country will have more opportunities to exploit the positive effects of FDI if it has

competitive supporting industries that can expand business deals with multinational assemblers (Thuy, 2007); (Chau, 2010); (Sang & Huyen, 2011);...).

Fifthly, the linkage role of supporting industries helps absorb technology transfer. Obviously, the expansion to attract FDI to the domestic market will not only provide a large amount of capital, but also go with innovation and technology transfer for domestic enterprises. In addition, the experiences in production management, human resource training... can also be conveyed through production and business cooperation with large economic groups, foreign investors. In addition, since then, it can improve efficiency and take advantage of integration (Thuy, 2007; Chau, 2010; Sang & Huyen, 2011...).

In summary, the linkage role of SI is extremely important. Through the linkage characteristics in the development of the domestic supporting industry, the supporting industry will affect the economy through many different channels and affect all types of business in the production and supply chains, processing and manufacturing industries: (1) the impact of promoting the linkage between businesses within the industry and between businesses in the economy; (2) the impact on enhancing the competitiveness of manufacturing enterprises, (3) affecting the attraction and orientation of FDI for all types of manufacturing enterprise, (4) technology development, promoting production innovation in all enterprises.

2.2. I/O model in impact analysis

I/O table stems from the ideas in Karl Marx's Book "Capital" when he found a direct relationship according to the technical law between the factors involved in the production process. This idea was then developed by Wassily Leontief by comprehensively mathematical the supply-demand relationship throughout the economy. Leontief considers each production technology a linear relationship between the number of products produced and the physical products and services as the input costs. This relationship is represented by a system of linear functions with the coefficients determined by the technological process. In Vietnam, the application of the I/O model has been widely used by many researchers. According to (Cuong, Trinh, & Hung, 2004); (Toan, 2011), (Thao, 2015)... the I/O model

has important meanings in analyzing the spillover effects of an industry on the whole economy; From there, it is also possible to apply this model to determine the importance and key industries in a national economy. Therefore, the use of the I/O model in the linkage impact analysis of the supporting industry in Vietnam, according to the author, is appropriate.

Principle relation:

$$(A^d + A^m).X + Y^d + Y^m - M = X \\ \implies A^d.X + Y^d + A^m.X + Y^m - M = X \quad (1)$$

Included:

$A^d.X$ is the intermediate cost vector of domestically produced product;

$A^m.X$ is the intermediate cost vector of the imported product;

Y^d is the domestically produced end-demand vector;

Y^m is the vector of the end-demand of the imported product (including the final consumption demand of the individual, the final consumption of the State, the accumulation of wealth and the export).

Import demand is divided into two purposes: for production ($A^m.X$) and for final consumption (Y^m) or:

$A^m.X + Y^m = M$, Then, equation (1) is rewritten as: $A^d.X + Y^d = X$

$$\implies X = (I - A^d)^{-1} Y^d \quad (2)$$

Thus, the relation (2) returns to the standard relation of Leontief in the non-competitive form, the inverse matrix Leontief $(I - A^d)^{-1}$ much better reflects the sensitivity and the spread of branches in economy.

Applying the model of I/O in spillover effect analysis:

The Leontief inverse matrix quantifies Keynes's notion of how much a unit change in demand ultimately affects production of sectors in the economy, and hence total output of the economy. In addition, in most countries around the world, people use the Leontief relationship to select key sectors of the economy, so that when the end-demand of that industry increases, it will strongly stimulate the whole economy through inter-industry linkage

- *Economic spillovers (Backlinks/Backward linkages):*

This is used to measure the relative importance of an industry as the user of physical products and services as input from the entire production system

compared to the average level of the whole economy. The backlink is determined by the ratio of the total column (corresponding to the industry being analyzed) of the Leontief matrix to the average of the entire production system. This ratio is also known as the spillover coefficient and is defined as:

$BL_i = \sum r_{ij}$ (add up according to the column of the Leontief matrix) (3)

And Backlinks coefficient = $n.BL_i / \sum BL_i$ (4)

Included: r_{ij} is the element of the matrix Leontief; n is the number of sectors in the model. If this ratio is greater than 1 and become higher, it means that the backward linkage of that industry is larger and when the industry grows rapidly, it will lead to rapid growth of all supply industries (products and services of the whole system).

- *Forward linkages (Sensitivity):*

Measure the importance of an industry as the supply of physical products and services to the entire production system. This association is seen as the sensitivity of the economy and is measured by the sum of the row elements of the Leontief inverse matrix relative to the system average. The forward linkage index of an industry is calculated as follows:

$FL_i = \sum r_{ij}$ (add by row of inverse matrix) (5)

Sensitivity = $n.FL_i / \sum FL_i$ (6)

If this ratio is greater than 1 and becomes higher, it means the greater the forward linkage of that industry and represents the relative necessity of that industry with the rest.

- *Import factor:*

Let "k" be the import coefficient vector between the import value and the production value for each product. We have:

$V1 = kA^d$ is a vector of direct effects imported during the manufacturing process. (7)

$V2 = k(I - A^d)^{-1}$ import requirement for the production of a final consumption unit. (8)

- *Impact on Value Added (GDP of the economy)*

Let "h" be the value-added coefficient vector between the added value and the production value for each product. We have:

$V^* = h.(I - A^d)^{-1}$ (9)

3. Data source and proceeding method

Applying the meaning of the Leontief inverse matrix, the study will calculate the impact coefficients of the SI to other industries in the economy,

production value, added value, coefficients backward and forward link, spillover coefficient to import.

Regarding data sources: using a non-competitive form of I/O of Vietnam in the two periods of 2012 and 2016.

The author approaches the concept of SI in a narrow sense, then SI is the production of basic materials, components and spare parts to serve the final manufacturing and assembly industry. SI products here include plastic materials, rubber, metals, basic chemicals, plastic-rubber components, metal components and electrical - electronic components. Based on this approach, the author determines the corresponding SI product group identified in I/O 2012 and I/O 2016, including (Table 3.1):

Because the product portfolio in the I/O 2012 and 2016 includes 164 industry codes and is not classified in further details, the product groups will be combined with some final products.

After determining the products of the SI, the author will conduct impact assessment according to the following steps:

Step 1: Aggregate the products and consider this a representative product group for the supporting industry.

Step 2: Calculate the impact of the supporting industry on the total production value of the whole economic sector, backward and forward linkage, import effect, and value added according to the formula (2) (3), (4), (5), (6), (7), (8), (9).

Step 3: Prepare the results and evaluation.

4. Results and discussion

4.1. An overview of the development of the supporting industry in Vietnam

In recent years, SI has become a central issue, concerned with the development of the Vietnamese government with many changes in awareness and policy. However, in general, supporting industries only meet at a low level the maximum demand for domestic production.

Regarding the number of enterprises:

According to the Ministry of Industry and Trade, the number of supporting enterprises in Vietnam is still small, there are only about 2,000 domestic supporting enterprises in the country, of which about 300 are participating in multinational conglomerates and it is still difficult to find a source for the produc-

Table 3.1: List of supporting industry products

Product names	I/O 2012; 2016	VCPA(level 5,6)	VSIC (level 4,5)
Primary plastic and synthetic rubber	64	20131+20132	2013
Products from rubber	68	22110+22120	2211+2212
Products from plastic	69	22201+22209	2220
Cast iron, iron and steel products	74	24100	2410
Non-ferrous metal products, precious metal products, metal casting services.	75	24200+24310+24320	2420+2431+2432
Prefabricated metal products (except for machinery and equipment)	76	25110+25120+25130 +25200+25910+ 25920+25930+25991 +25999	2511+2512+2513+ 2520+2591+2592+ 2599
Prefabricated metal products (except for machinery and equipment)	77	26100+26200	2610+2620

(Source: Vietnam Product Industry System, General Statistics Office)

tion chain. Component and spare parts production also attracted more than 242 thousand workers, mainly concentrated in metal parts manufacturing and electric - electronic component production (Ministry of Industry and Trade, 2018).

However, if you compare the number of firms producing spare parts and the number of firms in the main industry, an unreasonable difference can be seen. In 2018, the total number of manufacturing enterprises in the manufacturing industry was 96715, while the number of enterprises producing components and spare parts was only 2000, accounting for 2.07%, which is a very low rate and represents an underdeveloped supporting industry.

In terms of technology, enterprises mainly use technology and machinery from Japan, Taiwan, China, the EU and some machineries manufactured or upgraded domestically with medium level of technology. Basically, in general, technology in SI production in Vietnam is backward, due to lack of capital and low quality of human resources, it is dif-

ficult for us to quickly access modern production technology. Most of SI enterprises are small and medium enterprises, so the process of technological innovation is prolonged and takes longer.

Main products of the production of components and spare parts are all kinds of components and spare parts for domestic downstream industries such as motorcycles, cars, agricultural machines, movers, electrical industries. Some Vietnamese component manufacturing enterprises have quite good capacities in the fields of: Manufacturing molds of all kinds; bicycle and motorbike components; standard mechanical components; power cable; plastic components - technical rubber; tires and tubes of all kinds. These products have met the domestic demand quite well and are exported to many countries around the world. However, basically, the level of meeting the demand for domestic production is still very limited. The products produced by domestic enterprises have low quality, high cost (outdated technology, slow innovation due to limited

resources, poor production process...), so they can only be sold domestically. In addition, among manufacturing industries, with the exception of motor-bikes, which have a high percentage of domestic supply, the rest have a relatively low percentage of domestic supply, especially is a high-tech industry (the percentage of domestic supply is only 10%) (Ministry of Industry and Trade, 2018).

Regarding FDI attraction: Vietnam is an attractive investment destination for electronics manufacturers, especially in the context of production shift, risk allocation, avoiding focusing on China only. In the last November, more and more FDI enterprises in the electronics field have invested in expanding production in our country. Specifically: on November 14, 2020, Universal Scientific Industrial (USI) started a factory to assemble and manufacture electronic circuit boards at DEEP C Industrial Park in Hai Phong with an initial investment capital of 200 million USD (expected to increase investment capital to 400 million USD in the next period). Then, on November 25, 2020, Foxconn, officially known as Hong Hai Science and Technology Group, announced an investment of \$ 270 million to establish a new subsidiary called FuKang Technology to help expand production activities in Vietnam.

Major markets and customers of components and spare parts manufacturing enterprises are FDI enterprises, focusing on both manufacturing and assembling enterprises and component manufacturing enterprises. FDI customers have had a strong impact, promoting the development of Vietnam's supporting industries. While many manufacturing industries were heavily affected by the Covid-19 epidemic, many parts and accessories manufacturing sectors were still growing fairly well. Especially, some SI serving automobile, electronics... have a fairly good growth rate in terms of both exports and imports in the past time. The main export markets of component manufacturing enterprises are countries and regions in East Asia (including Japan, Korea, China, Hong Kong, and Taiwan, these are also countries/regions having a huge investment in Vietnam) and other countries in the ASEAN region. Regarding the import of components and spare parts, the main markets are also East Asian countries such as China, Korea, and Japan.

In short, for more than 10 years of establishment and development, the supporting industry in Vietnam is still in a underdeveloped state, which also leads to the fact that the manufacturing activities of the processing and manufacturing industry depend heavily on imported materials. This will lead to many negative impacts on the activities of domestic manufacturing and processing and industries, especially under the impact of the pandemic, the global production and supply activities will continue to be disrupted due to quarantine measures, shutting down the economy.

4.2. The results of the analysis of the linkage effects of the supporting industries in Vietnam

Using Vietnam's I/O sheet in 2012 and 2016, assuming 2012 I/O table represents Vietnam's economic structure in the period 2011 - 2015; Table I/O 2016 represents the fluctuating trend from 2016 to 2020, the author calculates the impact coefficients of the SI in Vietnam on the production value of sectors in the economy; added value; import and forward linkage coefficients. Calculation results are presented in the table 4.1:

Regarding the linkage effect, SI has the largest forward linkage among 12 industry groups and tends to increase in the period 2016 - 2020, demonstrating the important role of SI to other manufacturing industries in the economy. However, the back-link coefficient of SI is relatively low, and tends to decrease in the period 2016 - 2020 (0.97), showing that the demand for domestic products to serve the production of domestic supporting industries remains at low level; the underdevelopment of the supporting industry has not created a driving force to promote production for the industries that supply inputs for the supporting industry; at the same time, this also shows that domestic production has not met the requirements for SI production.

Regarding spillover effects on imports: the spillover co-efficient on imports of the supporting industry is relatively large, second only to electronic products. This shows the huge dependence of SI production on import. In the context of complicated pandemic developments around the world, broken production chains and supply chains, this will cause many difficulties in industrial production in general and SI production in particular in Vietnam.

Table 4.1: *Impact co-efficients of supporting industries*

	2011-2015					2016-2020				
	Production factor / Impact on production value	Impacts on Added value	Back links	Forward links	Spillover coefficients to other sectors	Production factor / Impact on production value	Impacts on Added value	Back links	Forward links	Spillover coefficients to other sectors
Agriculture forestry seafood	1.75	0.61	1.05	0.95	0.61	2.18	0.65	1.07	1.29	0.74
Extractive	1.53	0.63	0.91	1.02	0.79	1.79	0.60	0.88	0.87	0.84
Processing food, beverages, and tobacco	1.90	0.41	1.13	0.94	0.54	2.86	0.61	1.41	0.87	0.81
Textiles, footwear, wood production, paper and printing products	1.57	0.46	0.93	0.99	1.11	1.96	0.48	0.97	0.95	1.08
Products from coal, petroleum products, chemical products; drugs, pharmaceutical chemistry; Glass, cement and other non-metallic minerals	1.87	0.50	1.11	1.30	1.05	2.17	0.50	1.07	1.48	1.03
Electronics	1.29	0.31	0.77	0.63	1.48	1.59	0.36	0.78	0.55	1.34
Supporting Industries	1.68	0.38	1.00	1.72	1.31	1.98	0.41	0.97	1.86	1.22
Manufacturing electrical equipment, civil electricity	1.61	0.33	0.96	0.62	1.42	1.84	0.41	0.90	0.64	1.22
Manufacturing machinery and equipment; means of transportation	1.98	0.42	1.18	0.78	1.22	2.16	0.45	1.06	0.69	1.15
Other Industries	1.68	0.44	1.00	0.70	1.17	1.95	0.46	0.96	0.62	1.12
Production of electricity, gas, water, wastewater treatment, construction	1.76	0.61	1.05	0.81	0.82	2.05	0.59	1.01	0.69	0.86
Trades and Services	1.52	0.75	0.91	1.56	0.49	1.85	0.71	0.91	1.48	0.60

(Source: Data processing from 2012, 2016 I/O tables, General Statistics Office)

Regarding the impacts on production of other industries, the calculation through I/O also shows that some industries in which SI has high sensitivity (forward link). These sectors are mainly concentrating in the manufacturing industry related to electricity and electronics production; devices; automobile and motorbike.

quite rapidly, the index of backward links of SI with the electronics industry tends to decrease in the period 2011-2016, and increase significantly in the period 2016-2020 (from 0.14 to 0.34). Thus, the supporting product manufacturing industries should make efforts to sustainably meet the domestic production needs, help production activities become

Table 4.2: Some industries are closely linked with the supporting industries

2012			2016		
Industry Names	Code	Sensitivity	Industry Names	Code	Sensitivity
SI		1.38	SI		1.52
Manufacturing electrical equipment, civil electrical appliances	81.84 85.86	0.36	Manufacturing electrical equipment, civil electrical appliances	81. 84 85. 86	0.49
Manufacturing machines and equipment; means of transport	87-93	0.33	Manufacturing machines and equipment; means of transport	87-93	0.37
Production of electricity, gas, water, wastewater treatment, construction	99-111	0.16	Electronic product	78-80	0.34
Other manufacturing industry	94-98	0.16	Production of electricity, gas, water, wastewater treatment, construction	99-111	0.21
Electronic product	78-80	0.14	Other manufacturing industry	94-98	0.21

(Source: Data processing from Table I/O 2012, 2016, General Statistics Office)

These are industries heavily influenced by the development of SI in the country. Developed supporting industries will provide intermediate inputs mainly for these industrial groups. However, there is a point to note, while the forward link index of supporting industries with machinery and equipment; means of transportation and production of electrical equipment, electrical appliances tend to increase

more proactive, and improve the competitiveness of the domestic industry.

4.3. Evaluation of the role of the linkage of the supporting industry under the impacts of the Covid-19 epidemic

Impacts of pandemic on the development of Vietnam's supporting industries:

Covid-19 pandemic originated in Wuhan, China from the end of 2019. Up to now, the epidemic has spread around the world, seriously affecting human health as well as the global economy. For the *Firstly*, there is a shortage in the supply of raw materials and input components. Vietnam is integrating deeply, many manufacturing industries following the supply chain model such as telephones, electronics, computers... are all negatively affected due to interruptions and faults in the global supply chain causing a lack of input supply. Because the industrial production sector of Vietnam is still heavily dependent on imported raw materials and fuels, mainly from China, South Korea and Japan (accounting for about 56% of Vietnam's intermediate goods supply in the year 2019) (Lực, 2020); (Long, 2020).

Many FDI enterprises in Vietnam and together with Vietnamese enterprises act as suppliers, agents of level 1, level 2... in the above industries are also affected, facing two major difficulties: (i) lack of input supply from outside and (ii) lack of workforce due to blockade, isolation or travel restrictions for workers and experts from partner countries.

Secondly, the consumption market is narrowed for both supporting enterprises and assembly enterprises. Many industrial manufacturing sectors focus only on the outsourcing segment for export. The Covid-19 epidemic has caused many difficulties in foreign trade activities, reducing the demand for output consumption, so partners have been, and will continue to delay, cancel orders, cause a decline in export turnover and quantity. Complicated developments of epidemics around the world, especially in the US and Europe - 2 major export markets of Vietnam have caused export orders to be postponed, canceled and temporary orders are not negotiated. (Luc, 2020); (Long, 2020).

Thirdly, the lack of capital for production and business for enterprises engaged in industrial production activities. According to the survey results of the General Statistics Office (2020), up to 45.4% of enterprises surveyed are short of capital for production and business, this is one of the top difficulties of businesses today and also is the general state of the entire business sector. Industry and construction enterprises had a capital shortage rate of 52.1%,

ranked second after the agriculture, forestry and fishery sector (General Statistics Office, 2020).

Fourth, the burdens of SI enterprises and assembly enterprises, including domestic enterprises and FDI enterprises, are caused by the Covid-19 epidemic. According to the General Statistics Office (2020), remuneration is considered the biggest burden for businesses at present. The Covid-19 epidemic makes the national economic situation difficult, the business activities of enterprises are delayed, in addition, enterprises are also under pressure from huge expenses to maintain the operation of the business. such as: expenses for renting premises, paying interest from banks, pay for labor, other regular expenses...

On a scale from 1 to 5, including: 1 is the largest burden, 5 is the smallest burden, businesses assess the level of each type of expense they are facing as follows:

Ranking according to the average score of the entire business sector, remuneration is considered the biggest burden for enterprises at the moment, with an average score of 1.89; bank interest payment 2.41 points; other regular operating expenses 2.67 points; site rental costs 2.68 points; other costs 4.02 points.

In terms of the proportion of businesses that choose the type of cost as the biggest burden, remuneration is the most chosen by businesses, accounting for 40.3%, paying interest on bank loans and renting premises are 30.8% and 27.2% respectively, and the last one is spending on other regular activities 16.8%.

Similar to the general trend of the entire business sector, remuneration is the biggest burden, the second expense receiving 1 point by enterprises is to pay interest from banks (except that FDI businesses opt for another regular expenditure).

The influence of SI linkages under the impact of the Covid-19 pandemic can be shown under the following aspects:

Firstly, from the results of the analysis of the above situation, it can be seen that, SI production in Vietnam is still in a nascent stage, underdeveloped, weak and lacking in both the size and number of enterprises; the linkage between enterprises in the internal supporting industries and between SI enterprises and assembly enterprises is still weak. In the context of a pandemic, the underdevelopment and weak linkage of the supporting industry will make the

operations of all domestic industrial enterprises more difficult due to limited accessibility and market penetration. The international market and global production chains were broken under the impact of the epidemic, making the import of SI products serving domestic industrial production face many limitations.

Secondly, we cannot deny the role of the supporting industry in the production of the remaining industries in the economy, this is reflected in the forward linkage index of the supporting industry at a relatively high level. Therefore, SI still needs to ensure development to limit imports, further promote domestic industrial production, thereby reducing the difficulty of input supply for assembly enterprises, manufacturing enterprises promote economic growth.

Thirdly, the weak linkage in SI production will hinder cooperation, production connection, business connection with FDI enterprises operating in the country as well as multinational corporations, transnational enterprises... limit the process of joining global production chains and supply chains. Therefore, promoting the development of supporting industries, whose focus is to promote linkages in production and supply of supporting products is important in grasping opportunities of capital flows movement trend of FDI to Vietnam recently.

Regarding the causes of the underdevelopment and weak linkage of the supporting industry in Vietnam:

Firstly, because the capacity of the SI enterprises themselves is still low, mainly focusing on the small and medium enterprises, lacking both capital, human resources and technology; while policies to attract investment capital, especially FDI, are mainly focusing on processing and assembling industries, the added value is low and does not promote the cohesion in industrial production activities. In the context of complicated epidemics around the world, the connection between production and business has become more difficult.

Secondly, the quality of industrial human resources is currently very low, the linkage between training institutions and enterprises is weak, so the labor force does not meet the requirements of production and technological innovation in enterprises..

Thirdly, production technology in enterprises is currently only average, while the government does not have strong policies to support enterprises to

innovate and apply advanced technology, and access to policies. Technology innovation funds are also facing many difficulties.

Fourthly, enterprises lack information about technology trends, market information, business connections... due to disruptions, shifts of supply chains, global industrial production chains in the context of pandemic

5. Conclusion and policy implications

From the above analysis and evaluation, it can be seen that SI is in a very underdeveloped state, however, the development of supporting industries to promote industrial production linkage is still an extremely necessary solution so that Vietnam can overcome difficulties in the context of a complicated epidemic in the world, and at the same time, can take advantage of opportunities from international economic integration. To be able to develop the SI to promote linkages in the context of a complicated epidemic, it is necessary to focus on a number of solutions as follows:

Firstly, focus on policies to attract investment, especially foreign direct investment. In the context of epidemic, along with conflicts between two major economies in the world, China and the US, Vietnam's supporting industries are facing many opportunities to attract FDI inflows. At this time, SI need sources of foreign direct investment to develop technology, create links in production and consumption of supporting products. In order to attract FDI projects into SI production, it is necessary to have policies to properly orient FDI flows into Vietnam. Along with that, there are appropriate incentives that are attractive enough. For medium-sized or higher FDI enterprises, often have relatively strong resources, so one of the incentives they are most interested in when investing in Vietnam is preferential corporate income tax. In addition, small and medium FDI enterprises with very high technology and production level are also the subjects that need to be targeted to attract. These businesses are small and medium sized, they need support and availability in terms of infrastructure such as premises, factory systems, administrative procedures... in supporting industrial groups.

Secondly, to increase the formulation and implementation of policies to support science and technol-

ogy for SI enterprises together with policies to improve the quality of human resources. In particular, in the immediate future, the policies to support technology can be implemented through the system of business associations, business support centers... to receive experts from countries with developed SI such as Korea, Japan... in order to provide technology guidance services, guidance on accessing new technologies, as well as training and improving human resources. The support centers and associations need to upgrade their facilities as well as professional qualifications to provide services such as quality inspection of supporting products for businesses; support in the construction and modernization of production technology; act a bridge to attract investment in technology for domestic supporting enterprises.

Thirdly, it is necessary to strengthen more policies to support information, introduction, trade promotion, and support enterprises to find new suppliers and new customers in the context of old supply chains being broken due to the effects of the pandemic. Organizations such as Business Associations, for example Small and Medium Business Associations; Hanoi Association of Supporting Industries Enterprises, Business Support Center... need to better promote the role of bridging information, investment and trade promotion between domestic supporting enterprises and corporations, assembly enterprises in Vietnam and multinational corporations, ...

References:

1. Bình, T. T. C. (2010), *Phát triển công nghiệp hỗ trợ trong ngành điện tử gia dụng ở Việt Nam*, (Tiến sỹ LATS Kinh tế), ĐH Kinh tế quốc dân, Hà Nội.
2. Bộ Công thương. (2018), *Thực trạng và giải pháp thúc đẩy phát triển công nghiệp hỗ trợ Việt Nam*, Paper presented at the Hội nghị về các giải pháp thúc đẩy phát triển công nghiệp hỗ trợ Việt Nam, Hà Nội.
3. Châu, H. V. (Ed.) (2010), *Chính sách phát triển công nghiệp hỗ trợ ở Việt Nam đến năm 2020*, Hà Nội: Nhà xuất bản Thông tin và Truyền thông.
4. Cường, B. B., Trinh, B., & Hùng, D. M. (2004), *Phương pháp phân tích kinh tế và môi trường thông qua mô hình Input - Output*, Hà Nội: Nhà xuất bản Thống kê.
5. Dobson, S. M. (1984), *An analysis of the role of linkages in peripheral area development: the case of devon and cornwall*, University of Exeter.
6. Liêm, P. S, *Tăng cường liên kết công nghiệp giữa Hà Nội và các địa phương trong vùng thủ đô*, Retrieved from http://www.vncold.vn/Modules/CMS/Upload/10/YKien_BinhLuan/141226/LienKetHNvaCacTinh.pdf.
7. Long, N. (2020), *Ngành công nghiệp chế biến chế tạo "ẩn mình" chống chọi với Covid-19*, Retrieved from <https://www.vcci.com.vn/nganh-cong-nghiep-che-bien-che-tao-oan-minh-chong-choi-voi-covid-19>
8. Lực, C. V. (2020), *Đại dịch Covid-19 tác động mạnh đến ngành kinh tế nào của Việt Nam?*, Retrieved from <https://trungtamwto.vn/chuyen-de/15243-dai-dich-covid-19-tac-dong-manh-den-nganh-kinh-te-nao-cua-viet-nam>
9. Mori, J. (2005), *Development of Supporting Industries for Vietnam's Industrialization: Increasing Positive Vertical Externalities through Collaborative Training*, (Master), The Fletcher School, Tufts University.
10. Porter, M. (2012), *Lợi thế cạnh tranh quốc gia* (sách dịch), (N. N. Toàn, L. N. Hà, N. Q. Nga, & L. T. Hải, Trans.). Hồ Chí Minh, Việt Nam: Nhà xuất bản Trẻ.
11. Sang, L. X., & Huyền, N. T. T. (2011), *Chính sách thúc đẩy phát triển công nghiệp hỗ trợ: Lý luận, thực tiễn và định hướng cho Việt Nam*, Paper presented at the Chính sách tài chính hỗ trợ phát triển công nghiệp hỗ trợ Việt Nam, Hà Nội, Việt Nam.
12. Sodhi, H. S. (2020), *Effect of Corona Virus on the Manufacturing and Supply Chain Industry across World*, doi:10.26488/IEJ.13.6.1251.
13. Sulistiyani, & Riyanto, S. (2020), *The Impact of the Covid-19 Pandemic on the Manufacturing Industry*, International Journal of Research and Innovation in Social Science (IJRISS), IV(Issue VI, June 2020), 172-175.
14. Thảo, N. P. (2015), *Sử dụng mô hình cân đối liên ngành trong việc lựa chọn ngành kinh tế trọng điểm của Việt Nam*, Tạp chí Khoa học ĐHQGHN: Kinh tế và Kinh doanh, 31(4), 1-10.
15. Thủy, N. T. X. (2007), *Chương 2: Công nghiệp hỗ trợ: Tổng quan về khái niệm và sự phát triển*. In K. Ohno (Ed.), *Xây dựng công nghiệp hỗ*

trợ tại Việt Nam (pp. 29-52), Việt Nam: Nhà xuất bản Lao Động Xã Hội.

16. Toàn, N. M. (2011), *Mô hình cân đối liên ngành trong phân tích và dự báo sản lượng, thu nhập và việc làm*, Tạp chí Khoa học và Công nghệ, Đại học Đà Nẵng, 3(44), 215-223.

17. Tổng cục Thống kê. (2020), *Báo cáo Kết quả khảo sát đánh giá tác động của dịch Covid-19 đến hoạt động sản xuất, kinh doanh của doanh nghiệp*, Retrieved from Hà Nội: <https://www.gso.gov.vn/default.aspx?tabid=382&idmid=2&ItemID=19623>.

18. UNIDO. (2020), *Impact of Covid-19 on the manufacturing sector in Egypt*, Retrieved from https://www.unido.org/sites/default/files/files/2020-08/Brefing_Note_Egypt_Impact_of_COVID19_on_the_Manufacurting_Sector.pdf.

Summary

Bài nghiên cứu sẽ đi vào xem xét vai trò thúc đẩy liên kết của ngành sản xuất công nghiệp hỗ trợ (CNHT) Việt Nam trong bối cảnh từ cuối năm 2019 đến nay, nền kinh tế thế giới và trong nước đang phải gánh chịu những tác động nặng nề từ đại dịch Covid-19. Để đẩy lùi các thách thức, phát triển CNHT sẽ có ý nghĩa vô cùng quan trọng trong việc thúc đẩy sự liên kết giữa doanh nghiệp CNHT nội địa và doanh nghiệp lắp ráp, doanh nghiệp FDI,... nâng cao tỷ lệ nội địa hóa, nâng cao giá trị gia tăng cho sản phẩm và nâng cao sức cạnh tranh cho sản phẩm và cả nền kinh tế,... Dựa trên cách tiếp cận phương pháp bảng cân đối liên ngành (I/O), bài viết xác định các hệ số liên kết giữa ngành CNHT với các ngành sản xuất khác trong nền kinh tế và với toàn bộ nền kinh tế, từ đó, kết luận của bài viết cho thấy rằng, ngành CNHT có vai trò quan trọng với tư cách là ngành cung ứng đầu vào cho các ngành sản xuất trong nền kinh tế và thúc đẩy liên kết sẽ có ý nghĩa lớn trong quá trình phát triển các ngành CN CBCT Việt Nam trong bối cảnh đại dịch.

TRAN VIET THAO

1. Personal Profile:

- Name: **Tran Viet Thao**
- Date of birth: 10th March, 1980
- Title: Doctor
- Workplace: Thuongmai University
- Position: Deputy Manager, Department of Research Administration

2. Major research directions:

- (1) Researching works for teaching - learning activities of lecturers and students. This research direction is carried out by scientific researchs.
- (2) Issues of trade and commercial infrastructure ...
- (3) Restructuring issues, sustainable development, economic integration, enterprises ...
- (4) Macroeconomic issues such as growth, budget, investment, import and export ...

3. Publications the author has published his works:

- Journal of Trade Science
- Journal of Information and Economic Forecasting
- Journal of Asia-Pacific Economics
- Journal of Information and Socio-Economic Forecasting
- Journal of Science and Technology
- Journal of Science, Technology and Food
- Industry and Trade Magazine
- Economy and Forecast Review
- Trade Journal
- Publishing Research Quarterly