

USING SUPPLY CHAIN INTEGRATION THEORY FOR ESTABLISH INDUSTRIAL CLUSTER TO FACILITATE THE GROWTH OF SMALL AND MEDIUM ENTERPRISES: EVIDENCE IN VIETNAM

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Abstract. In an economy, the product of one industry is the input to another, the product of one enterprise is the input of another business and the end consumer. Countries that know how to create industry linkages to attract businesses to participate will promote business growth in both quantity and quality. In Vietnam, an efficient chain of industry links has not been formed, so it has not created favorable conditions for businesses to develop. Most of the FDI enterprises come to Vietnam to participate partly in the global value chain, but the ability of domestic enterprises to participate is still very limited. The domestic industry linkage chain has not been clearly shaped, the domestic enterprises operate sporadically, so it has not created an attractive ecosystem for small and medium enterprises to participate. To create industry linkages for domestic enterprises to participate, it is necessary to build models of production organization in industries from market research, product design, and organization of satellite businesses to the production of details and components in order to establish a distribution system to the market. Mechanisms and policies focus on supporting and providing incentives for enterprises joining industry clusters operating in all phases of investment in research, design, supply of ancillary products, and distribution.

Keywords: Industrial clusters; supply chains integration; business ecosystems

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JEL Classifications: F15, L69, Q01

1. Introduction

Vietnam is showing a high determination in business development in both quantity and quality. Many policies to promote and support businesses have been issued such as the Law on Small and Medium Enterprise Support, the Law on High Technologies, the Decree on Industrial Development of Supporting. At the same time, in recent years, the Government has issued many resolutions related to business development, administrative reform, and improved business environment. However, business development has not been as expected. The number of newly established businesses has grown well, but their operations are ineffective and unsustainable. Industry linkages between domestic and FDI enterprises have not yet formed, as well as few domestic enterprises participating in the global supply chain, few FDI enterprises place orders for domestic enterprises. Therefore, the stability of the order source of the business is not high and the development is not sustainable. The goal of this study is to analyze the current state of the link chains in a number of typical industries in order to point out the causes of the fragmentation of domestic firms. Then, proposing a number of solutions to promote the formation of industry linkages to create conditions for SMEs to develop.

2. Literature Review

2.1. Overview of Supply Chain Integration (SCI)

Supply Chain (SC) is a manufacturing and distribution network that carries out the functions of purchasing raw materials, transforming and distributing final products to customers (Suong, 2011, 2012, 2017; Suong & Tri, 2019). SC is made up of relevant, necessary, direct or indirect phases to satisfy customer requirements. SC comprises not just manufacturers and suppliers, but also warehouses, dealers, retailers and consumers. SC is generally considered as connections in the business process among suppliers, customers, manufacturers and service providers. This implies that SC is a process from the raw material to the finished product that is manufactured and delivered to consumers to fulfill two fundamental objectives (i) forming a relationship among suppliers and customers as they affect SC's outcomes and performance, (ii) increase productivity and efficiency through SC. An integrated partnership is therefore important to enhance the effectiveness of SC's sector.

Supply chain integration (SCI) can be broadly defined as the strategic collaboration in both intra-organizational and inter-organizational processes. SCI is widely recognized as a multidimensional variable (Flynn et al., 2010) because it involves information sharing, cooperation, partnership, and collaboration across functions, suppliers and customers. SCI is further divided into three dimensions: internal integration (II), supplier integration (SI), and customer integration (CI). In other words, SCI dimensions and the external environment can be seen as the bundles of characteristics that are mutually supportive, leading to specific arcs of integration. Industrial differences may be explained by the fact that external environments such as supply market, customer demand, and industrial norms may create different dominant coalitions in an industry. SCI requires the sharing, preparation, collaboration and controlling materials, parts and finished products at strategic, tactical and operational levels (Towill, Childerhouse & Disney, 2002). In addition to the search, contract, negotiation and tracking costs associated with outsourcing, SCI decreases the costs of transactions due to the fewer partners involved. As a result, businesses can use SCI to achieve benefits from making and buying (Shen, 2007).

In addition, internal fit can be achieved when there are tight constellations of mutually supportive SI, II and CI, forming the balanced SCI configurations. To achieve internal fit, II is maintained at a level close to the levels of SI and CI such that efforts in SI and CI can be effectively translated into purchasing, production, inventory and distribution planning. From the organizational information processing (Schoenherr & Swink, 2012; Wong et al., 2011) and organizational capability perspectives (Zhao et al., 2011; Wong et al., 2013), demand input from the customers (via CI) and supply information from suppliers (via SI) have to be effectively 'absorbed' by II. II interacts with SI and CI which then complement each other by enabling information sharing, trust, and collaboration across functions, suppliers and customers. Such a complementary effect has been previously acknowledged (Gimenez & Ventura, 2005; Stank et al., 2001).

Today competition stimulates organizations to improve their capabilities for customer fulfillment, reliability and product versatility and many organizations take advantage of SCI to achieve this objective. In order to achieve reliable, effective product, service, information, money and decision flows to optimize the value of the SCI's client, SCI intends to cooperate strategically with its SC partners and to manage intra- and inter- corporation processes (Fabbe & Jahre, 2007). Although outsourcing can reduce production costs, SCI also decreases searching, contracting, negotiation and surveillance costs associated with outsourcing due to fewer partners involved.

However, there are also industries with very different upstream and downstream environments so firms in such industries might form different arcs of integration (Frohlich & Westbrook, 2001) or unbalanced SCI configurations (Flynn et al., 2010). Such arcs are formed to fit with the competitive environment (external fit). Some industries (e.g., those producing commodities, functional products) compete mostly on cost so there may be an emphasis in II and SI to cut cost, others rely on customer services so they may emphasize CI. For example, automotive manufacturers are known to focus on customer orientation (Brady and Cronin, 2001); electronics manufacturers emphasize CI due to demand uncertainty; while food manufacturers may focus on SI to

secure reliable supplies of low-cost raw materials (Goss et al., 2000). Despite SCI's benefits, a high degree of integration goes with some inherent risks for the companies involved in the alliance including the risks of confidential corporate information being leaked to potential rivals, difficulties to coordinate business policies, and the potential for interdependence among partners. SCI partners need investments in new assets to customize machinery and technology, as well as to cover costs in designing and instructing new work and consulting teams' projects, which are too expensive and increase risk by sharing partners to benefit from the relationship. In addition, the lack of confidence and trust among SC partners could lead to opportunistic behavior at the cost of overall SC performance and profitability. Specific definitions of SCI were given by some authors. The definition of integration is defined by Romano (2003) as a mechanism for supporting business processes across the supply network to overcome internal and inter-organizational boundaries. Singh & Kumar (2020) mentioned it has become challenging for small and medium enterprises (SMEs) of growing economies to survive in this global competition. Effective supply chain management (SCM) can be a major driving factor for success of Indian SMEs in dynamic world economy. SMEs face many operational challenges while implementing effective SCM. Last but not least, Benzidia & Makaoui (2020) tested using data gathered from 126 French SMEs. Drawing upon resource orchestration theory, the empirical results provide useful guidelines for SMEs that wish to invest in e-procurement tools to enhance competitiveness and performance.

2.1.2 Industrial cluster integration

It becomes important to integrate different business activities between units, when businesses pay a great deal of attention to their core business activities. Their fertility therefore relies on their ability to manage internal and external operations beyond their own borders in the value chain. The need for integration is obvious in SCs as companies that form SCs are affected by the activities of other organizations. SC cooperation is achieved when a decision-maker takes decisions that are rational and beneficial to the entire SC. The term *arcs of integration* reflects two aspects of integration: direction and degree. The first dimension concerns integration towards consumers and/or suppliers and the second dimension, level or degree of integration, which describes the extent to which businesses function in organizational terms and the extent to which knowledge is exchanged.

Industrial cluster concept

An industrial cluster is the geographic concentration of intended industries which take advantage of opportunities via geographic links. Companies in the industrial cluster will share these requirements and internal relationships with suppliers and customers. Relationships inside the company requires additional services from consulting, training and coaching, financial institutions, key companies. The industrial cluster will create a high-quality workforce and export goods, services, linking relationships between housing authorities, universities, research institutes, foundations and other stakeholders (Porter, 1990). According to Porter (2001), the strength of a cluster is tied to the level of fierce competition among businesses in the clusters and it requires that every organization that wants to exist must achieve a certain level of performance. There is a lot of contemporary literature devoted to the clusters' performance and their impact on regional development (Huy, 2012; Monni et al., 2017; Amraou et al., 2019; Bubligné et al., 2019; Huy et al., 2020; Lis, 2020).

Business ecosystem

Business ecosystems will consist of entities that compete and collaborate with each other with survival goals. Elements of the business ecosystem include fragmentation, intrinsic alignment, cooperation and competition. The three main factors that make one business successful are the productivity, the intrinsic strength of the ecosystem, the event and opportunities for the creation of new businesses. Productivity helps entrepreneurs survive in market competition. The power of businesses prevents it from being damaged by internal or external adverse agents and new-formed businesses will replace non-viable businesses, rebalancing the business ecosystem.

2.2 The role of industry linkages in the development of small and medium enterprises

Any economic sector is established by the stages of raw materials, preliminary processing to intermediate products; terminal products; and distribution to consumers. To produce the end products, it is necessary to have the participation of many businesses distributed in many different spaces according to the comparative advantages of each locality. In the value chain of the industry, the role of the enterprise manufacturing the end product is very important, they guide all activities of other enterprises in the value chain. It is a business of researching, designing brands and assembling end products.

The enterprise holding the end product has a strong research and development (R&D) and branding apparatus, this is the “core stage” of the industry. They do market research and detailed product design about the product’s design, packaging, style, materials, and texture. Research products are produced and tested many times to order raw materials from suppliers, manufacturing intermediate products and linking with communication and distributing products to the market. The production process of those firms creates a lot of demand for businesses in the value chain (Dien, 2016). Countries that attract many private label end product businesses will form an efficient chain of industry links. Meanwhile, the linkage in production and business will be closer, the business opportunities of SMEs will be better, and production orders will be more stable. When the industry linkage chain is formed, it also creates many business opportunities for businesses providing ancillary services. Experience in industrialization in countries shows that the growth of branded businesses with end-product has led to the development of the business community producing products and supporting services. This development process is thanks to reasonable regulatory policies of the Government. The industrialization process has always focused on fundamental industries, which gradually formed two groups of activities: the “core stage” group and the supporting group. For example, Japan in the 1940s, when the mechanical industry thrived, mechanical enterprises needed to further specialize in the production of finished products and minimize costs, so there was a need to order components. From other businesses, thereby creating a driving force for SMEs to participate in manufacturing components for this industry, at that time, support for the mechanical industry was born (Dien, 2014). To promote SMEs to participate in the value chain, the Government has issued many supportive policies and operating orientations (see Figure 1).

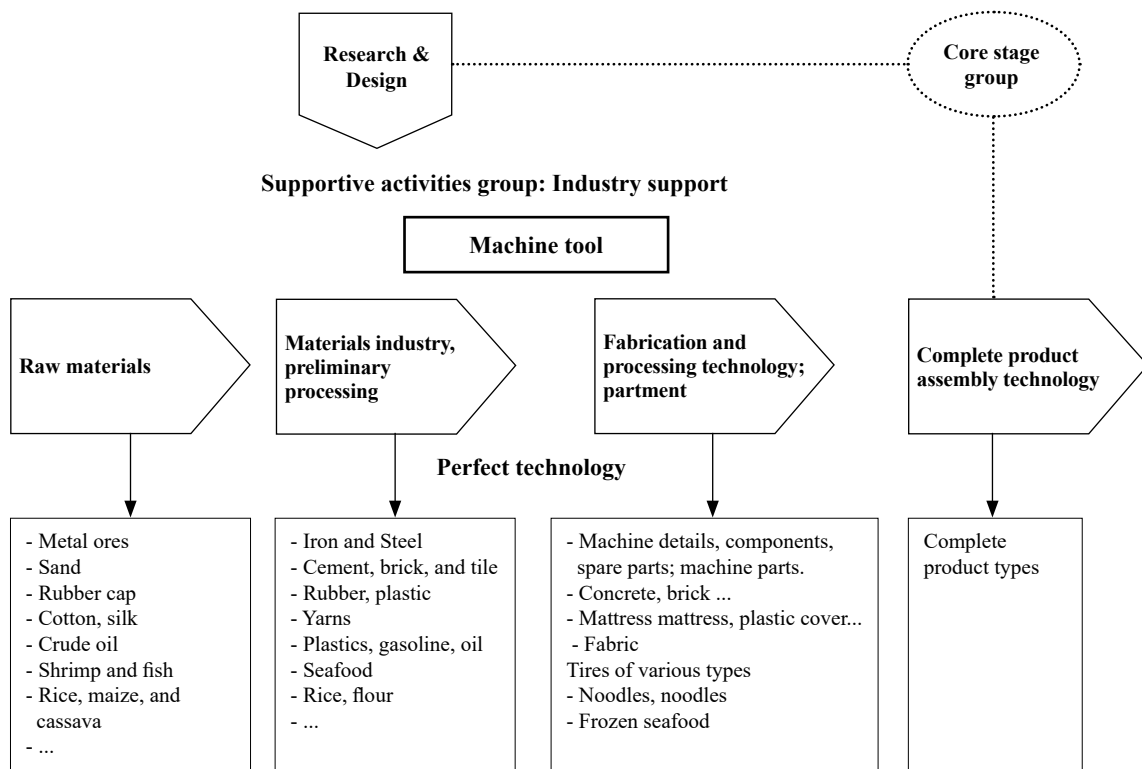


Figure 1. Value chains of industries

Source: Research by authors, 2020

Unlike Japan, in recent decades, in countries such as Thailand, Malaysia, and Korea, the promotion of SME development is associated with the activities of industries in which the FDI sector participates. Governments of these countries are quite successful in their policies to attract and orient FDI enterprises to create a driving force for domestic SME development through policies to promote cooperation between domestic enterprises and FDI (Dien, 2014). From the above arguments, it is shown that the development of SMEs depends on the needs of large firms operating in the “core stages” of those industries. When the country attracts and develops industries that manufacture and assemble end-product, it will motivate SMEs to invest in. When technology for machine tool production develops strongly, it will reduce technology investment costs and reduce business risks, leading to improving SME competitiveness. When the competitiveness of domestic SMEs increases, the confidence of domestic and foreign customers will be created, leading to the need towards domestic enterprises. The model of SME development conditions is outlined in Figure 2 below.

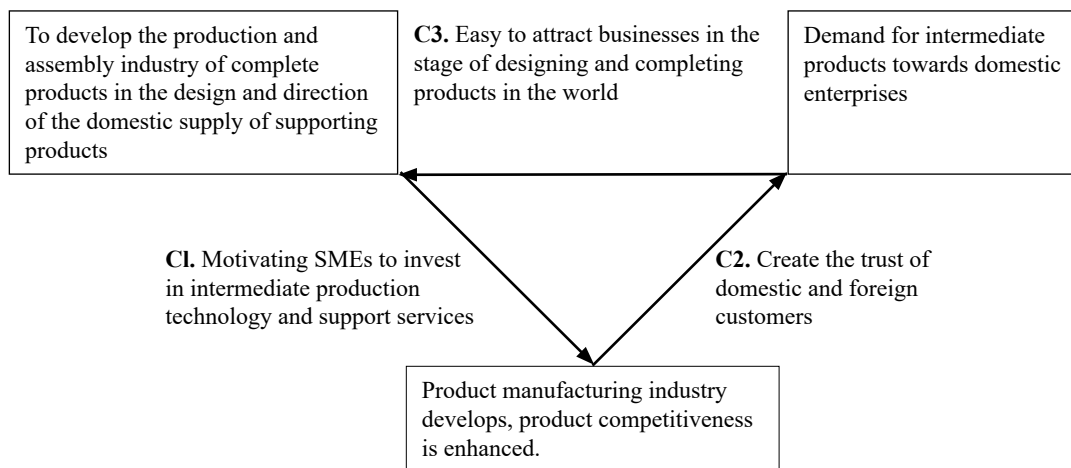


Figure 2. National model of SME development conditions

Source: Research authors, 2020

3. Research methods

This study is carried out using two methods: (1) Qualitative research aims to establish and calibrate the component scale: partners trust rates, the level of maturity between partners, cultural cooperation, partner leadership, price policies, product strategy, technology and information sharing within partners in SC of Vietnam dairy industry; (2) Quantitative research focuses on collecting, analyzing data and testing component scale, measuring research theoretical models and hypotheses. Preliminary research is established, adjusted and supplemented by qualitative and quantitative methods to observed variables. Preliminary qualitative study is undertaken by prudent experts after discussions with managers interested in the dairy industry by the sampling approach. The discussed factors affecting the integration of SC stakeholders were brought to the group for comment. The research model and proposed scale were established by a group of writers and updated by a discussion group. The discussion group endorses the new model after sharing ideas. Some of the names in the scale components will be calibrated in the discussion group, some of the variables found are modified and the scale is amended. The research group therefore agrees that the dairy industry variables include: (1) the confidence levels among partners, (2) the level of maturity of relationships among partners, (3) the cultural cooperation, (4) the leadership of partners, (5) the price policy of partners, (6) the product strategy of partners, (7) technology among partners, (8) information sharing among partners. There are 39 observational variables of the research model measured in the Linkert scale of 5 with 1 - completely disagree to 5 - completely agree

4. Research outcomes and debate

4.1 Overview of Vietnamese SMEs

In the 2010-2019 period, the enterprise sector contributed to the state budget an annual average of 12.6%, equal to over 61% of GDP. SMEs account for 98% of the total business operating, contributing about 45% of GDP, 31% of total state budget revenue and creating jobs for more than 5 million workers. In the period 2012-2019, on average, the number of SMEs rose by 8.7%, higher than the average growth rate of big businesses of 5.4% (Department of Enterprise Development, Ministry of Planning and Investment, 2018). Vietnamese SMEs are still subject to a lot of restrictions as most of them do services, only approximately 20% are in production activities; 42% of businesses with annual turnover less than 1 billion VND and 85% of businesses operating with a turnover of less than 2 billion VND. Every year the number of private businesses goes up but they are still small companies. The average human/business ratio is still low and currently 80-100 people are working in ASEAN countries. Meanwhile, each enterprise has only one enterprise (Department of Business Development Industry, Ministry of Planning and Investment, 2018). However, the rate of Vietnamese enterprises participating in the global supply chain is only 21%, while this rate in Thailand is 30%, Malaysia is 46%. Vietnamese companies' investment costs in science and technology innovation are below 0.3% of revenue, compared with 5% in India, South Korea 10%, and Japan 50% (National Assembly Standing Committee, Legislative Research Institute, Legislative Science Information Center, 2017).

4.2 The role of SMEs in the industry value chain

SMEs in Vietnam mainly participate in simple stages such as support services, repair, catering, stationery, manuals, transportation for most industries. The proportion of SMEs producing intermediate products for the "core" group of businesses is not high. Typical in some industries are as follows:

Electrical - electronic equipment industry

The structure of the electrical and electronic equipment industry is seriously imbalanced, the household electronic products account for nearly 90%, and there is a lack of specialized electronic products. SMEs mainly participate in manufacturing with processing methods, only making machine shells, frames, racks, packaging, processing circuit boards, sensors, signal collecting devices, and conductive vibration motors. Auxiliary products such as transformer oil, insulating paint and auto control components must be imported. The localization rate of products for the electrical - electronic equipment industry is as follows (see Table 1):

Table 1. Rate of localization of electrical - electronic equipment

Product Groups	The products have manufacturing strengths	The rate of localization
Supporting industry for Audiovisual equipment cluster	Wafer, sensor, printed circuit, information technology equipment, signal receiver, mobile phone motor, camera electronics	6%
Supporting industry for electrostatic equipment cluster	The whole core part (punching iron, wire), peripheral parts like frame, holder etc.	60%
Supporting industry for rotary electrical equipment cluster	Stator and rotor parts, peripheral parts (impellers, radiator blades etc.	55%
Supporting industry for other electrical equipment cluster	Metal and plastic parts such as trays, base, covers; Some products are supported from domestic accessories such as wires, electrical panels, switches	50%

Source: Author's survey of 10 Vietnamese electric - electronic equipment enterprises in 2018.

SMEs mainly participate in supporting production of electrical equipment; for electronics, only participating in finishing products by making packages, manuals, and plastic details; manufactured following pre-designs, or processed according to foreign models. For electronic ancillary products that can only supply packaging, manuals, and plastic components, only a few FDI enterprises can produce electronic circuit boards and industrial electronic equipment to the order.

Mechanical engineering industry

Materials used for the industry are mainly prefabricated metals. In the country, there is a stable supply of steel that can serve the mechanical engineering industry. The biggest difficulty is mold steel. If this problem can be solved, development of supporting production can be ensured. In the production of intermediate products, mainly serving the production of household mechanical products, repairing and replacing equipment in import synchronous lines. The localization rate of products of the mechanical engineering industry is as follows (see Table 2):

Table 2. The localization rate of mechanical engineering

Product Groups	The products have manufacturing strengths	The rate of localization
Supporting industries for metal structural clusters, barrels, tanks	Corrugated iron, steel pipe, shaped steel	76%
Supporting industry for Mold and metal tools assemblies	Cluster Mold and metal tools (the biggest difficulty is now steel making molds)	55%
Supporting industry for engines, turbines, pumps, compressors	Details of small engine and diesel engine for agricultural production. Cast iron pump or compressor body and other accessories for assembly and repair such as glove ring, oil stopper, hand ring ...	32%
Supporting industry for kitchen clusters, furnaces	Some parts such as furnace, burning fear, conveyor	42%
Supporting industry for common and specialized industrial machinery clusters	Usually only in the chassis	13,5%
Supporting industry for manual machines and other mechanical goods	Supporting products for manual machines and mechanical products such as: semi-finished products, surface treatment and providing standard details (feathers, nuts, washers, pins ...), balls, cakes tooth..	60%

Source: Author's survey of article 10 Vietnamese mechanical engineering enterprises in 2018

Motor vehicle manufacturing industry

SMEs are mainly in charge of electrostatic painting, powder coating, shells, wire sets, airbags, furniture, plastic details, tires, brake pads, seats, beds, lampshades, oil filters, glass, tweezers, air conditioner, semiconductor IC, hydraulic control panel. Most of the details and detail assemblies have to be imported such as: engine, chassis, transmission system, control system, carburetor. The product localization rate of the automobile manufacturing and assembly industry is as follows (see Table 3)

Table 3. The localization rate of automobile production and assembly

Product Groups	The products have manufacturing strengths	The rate of localization
Industrial support for individual vehicle clusters	The process of electrophoresis coating for some frame and shell details Please pay tribute to the body after complete installation. Supporting products such as wire sets, airbags, hydraulic control panel details, semiconductor ICs, oil filters are provided by a few supporting companies (usually foreign-invested enterprises). Tire (shell) products for cars also began to appear on the wall	8,5%
Supporting industry for passenger cars	Sewing of body and cushion seats, brake pads, tubes, tires, floor mats, accelerators, interior plastic products, door handles, seats, beds, transmission wires	20%
Supporting industry for Trucks and other specialized vehicles	For the body and chassis, a number of auto parts and accessories have been studied and manufactured to include high-load tires, leaf tweezers, oil filters, lamp holders, brake pads, glass. , Carpet...	15,5%

Source: Author's survey of article 2 Vietnamese car manufacturing and assembling enterprises in 2018

Most of the car manufacturers are FDI enterprises. Some FDI enterprises in the automotive components sector operate under the model of export processing enterprises, the quantity supplied to the domestic market is very small, making it difficult for SMEs to participate in the supply for industry.

Textile industry

Vietnam’s garment products are diversified, but mainly produced by outsourcing methods, so most of the raw materials are ordered and supplied by customers. Although in the past, Ho Chi Minh City has oriented to change the business mode of the garment industry from outsourcing to design ownership, but has not yet brought into play its effectiveness because businesses still have limited designs and low market capacity; Meanwhile, the construction of fashion brands to export Vietnamese branded products is facing many difficulties because there are many big fashion brands in the world, and the research and development level of products is very high. This leads to a lack of motivation for enterprises to participate in production to support the industry. SMEs produce intermediate products mainly in low value-added stages such as buttons, mex, foam, containers, cotton pads, plastic fasteners, staples, blankets-pads, threads, key chains, glue, bandages, tape. The stages of high added value such as fiber, chemicals - dyeing aids, dyeing, flower printing and finished fabrics must be imported. The product localization rate of products in the textile and garment industry is as follows (see Table 4):

Table 4. Rate of localization of textiles and garments

Product Groups	The products have manufacturing strengths	The rate of localization
Industrial support for clusters of Fabrics, threads, nets, braids	Supporting industries for the production of textiles, non-woven fabrics, and net Fibers are the main supporting industrial products, mainly synthetic fibers accounting for ~ 98% in value), natural fibers only ~ 2%.	34,5%
Supporting industry for the Adult Clothing cluster	Many types of building materials (mex, erect foam, cotton cushion) or plastic, support ... are made available by local businesses, but for low- and middle-end products. Materials for export production must be imported	Mainly imported 42%
Supporting industry for the Children’s Clothing cluster	The domestic supply of raw materials is quite good	60%

Source: Author’s survey of article 10 Vietnam textile enterprises in 2018

Footwear industry group

Similar to the textile and garment industry, Vietnam’s leather and footwear industry is mainly export processing, the production and supply of raw and auxiliary materials of the industry depend heavily on foreign partners. Raw and auxiliary materials for footwear production, leather goods for export are mainly imported from China, Taiwan, and Korea under the designation of partners. With the outsourcing method, it will be difficult for SMEs to participate in activities supporting the industry. Raw leather products have not met the domestic production requirements, and tanning is limited; synthetic leather and artificial leather products have not met domestic demand and are of low quality. The localization rate of products of the leather footwear industry is as follows (see Table 5):

Table 5. Footwear localization rate

Product Groups	Rate of localization in 2013
Supporting industry for Footwear, Footwear and imitation leather for adults	37%
Supporting industry for children’s footwear, leather and imitation leather	38.5%
Supporting industry for shoes and canvas shoes	41%
Supporting industry for sports shoes cluster	39%
Supporting industries for other products that use leather and imitation leather	38%

Source: Deep interview with 10 leather shoe enterprises by authors, 2020.

From the above analysis, it shows that the development of SMEs has many limitations, not yet created a solid foundation for the sustainable development of the industry. Mechanical industry SMEs mainly serve the production of products related to household mechanics, repair and replacement of equipment in the import chain.

SMEs in the automobile industry and related fields are only at an average level, so they cannot participate deeply in the value chain of the automobile industry; SMEs in electronics are still at a low level; Garment and footwear SMEs depend largely on imports because they mainly produce and process (see Figure 3).

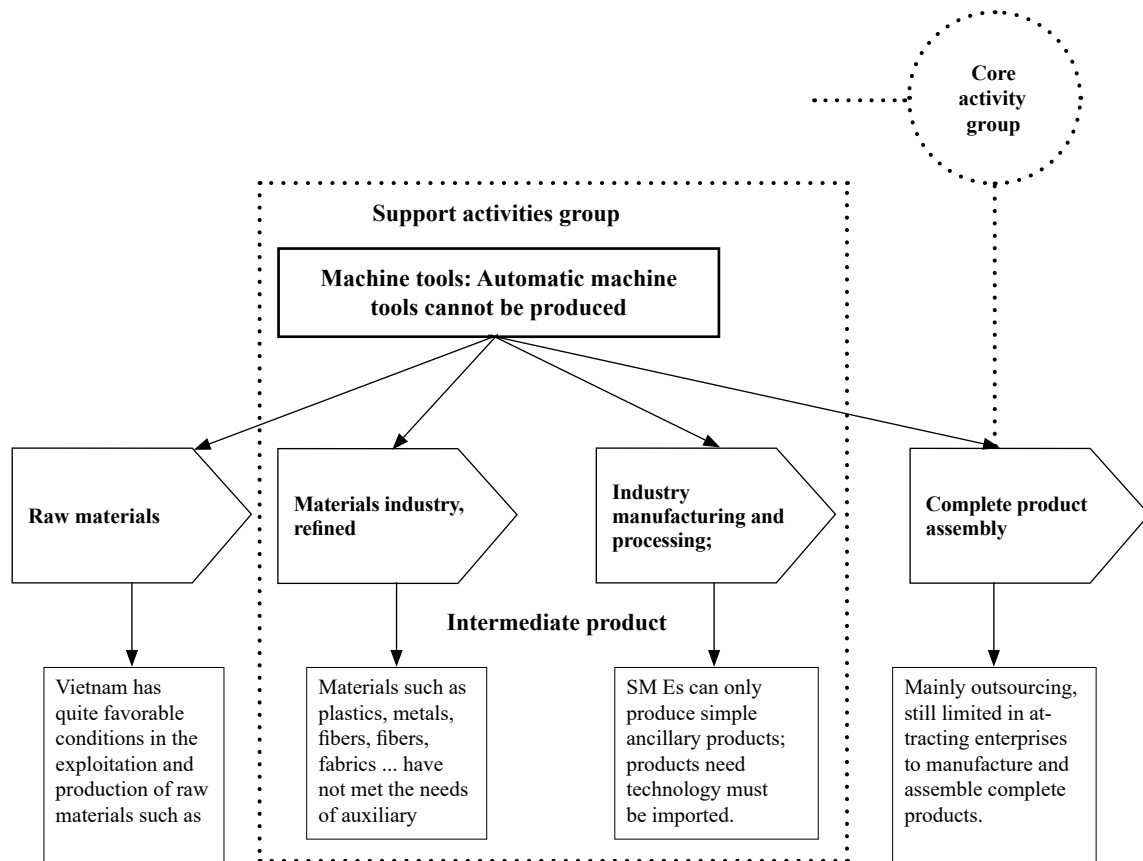


Figure 3. Summary of current state of Vietnam's industrial price chains

Source: Summary of authors, 2020.

Deriving from the below result, actors shared more views on tangibles as compared to other dimensions. Relating actors have more preference towards the aesthetic and facilities provided by the resorts as compared to the services delivered by others (see Table 6).

Table 6. Total comments under each dimension and their supporting industries

No	Dimensions	Total Comments	Positive (P)	Neutral (Ne)	Negative (N)	Ratio (P:Ne:N)
1	Supporting industry within suppliers	544	288	11	245	53:02:45
2	Supporting industry within manufacturers	472	184	38	250	39:08:53
3	Supporting industry within distributors	399	311	20	68	78:05:17
4	Supporting industry for subcontractors	435	222	4	209	51:01:48
5	Supporting industry between suppliers and manufacturers	363	228	15	120	63:04:33
6	Supporting industry between manufacturers and distributors	1378	896	69	413	65:05:30
7	Supporting industry between distributors and customers	37	30	4	3	81:11:08
Overall		3628	2159	161	1308	60:04:36

Source: The result includes predicted result and not the manually coded result for the test comments from 4 above industries, 2020.

4.3 Analysis of barriers to SMEs development

Market barriers, the demand for intermediate products have not been directed to domestic SMEs. End - product manufacturers in Vietnam maintain their processing methods for such a long time (such as textiles, leather shoes), so it is difficult to attract the supply of intermediate products as ordered by their customers. On the other hand, there are also some industries such as electronics, automobile manufacturing and assembly. FDI enterprises account for a major proportion with the orientation of the source of supply to support domestic SMEs due to not meeting the numerical requirements for quality and commitments in transactions. Furthermore, there is a lack of bridging between SMEs and FDI terminal product manufacturers to carry out the production and supply of ancillary products (Dien, 2017).

Technological barrier

Technology is slow to develop, most machine tools have to be imported. Vietnam has not been able to produce specialized machine tools in industries, but has to import technology from abroad with investment costs higher than many enterprises in other countries. This creates quite a barrier for SMEs to join the industry linkage chain. In addition, intermediate products are typically associated with the design and technical requirements of the end product manufacturer, so the production of the product requires integration with the manufacture and assembly of products. The end products should require SMEs to closely link with the manufacturers. Meanwhile, end product manufacturers in high value-added industries are often FDI enterprises that have established support networks with outside firms in the past. Vietnam's new SME supply chain is for delivering on the commitment.

On the other hand, for some industries such as yarn, weaving, finishing dyeing, component manufacturing, automobile assembly, electronic circuits require quite high technology investment costs. Thus, SMEs can hardly participate if there is a lack of linkage with large enterprises that manufacture end products. Moreover, in Vietnam, organizations with technology research and transfer functions such as Institute of Technology and Universities have not been linked with businesses in research and technology transfer. The reason is that the science and technology development investment policy has not had a binding mechanism between enterprises and the Institute / University. From the above analysis, it is shown that the technology barrier for SMEs is the most critical one, and is the reason why SMEs only participate in auxiliary activities at simple stages with the lowest added value in the industry value chain.

Barriers in attracting businesses to produce end products with their own brands (group of businesses in the core stage of the industry)

The weak production capacity of SMEs leads to the result that many major industries will lack competitiveness, which makes it difficult to attract FDI companies and they will have to depend heavily on imports. When it is unable to attract manufacturers of high added value end products, the market barriers for SMEs continue to be established (see Figure 4).

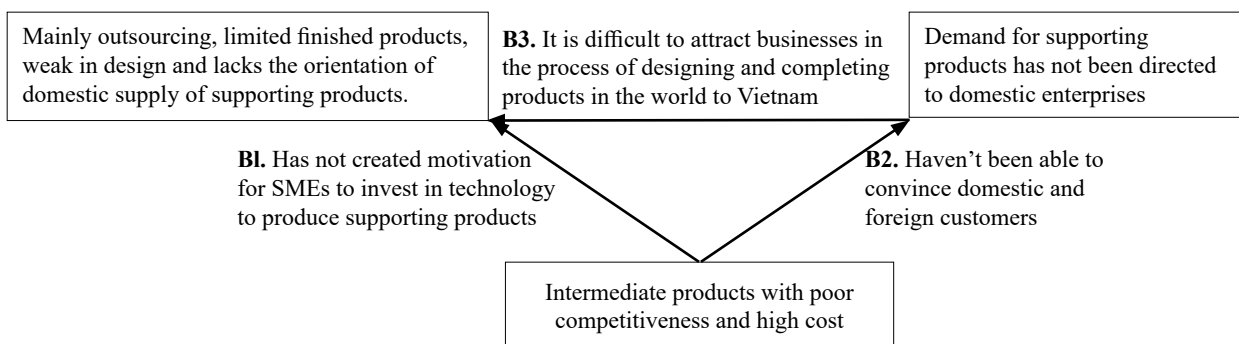


Figure 4. Summary of barriers to SME development

Source: Author's synthesis from analysis results.

4.4 Analysis of Vietnam's SME development policy

Over the past years, Vietnam has made many efforts to promote enterprises, the Government has focused on specific support policies: Promoting, encouraging and increasing the productivity of SMEs, innovative companies; Boosting start-ups; Supporting technology innovation, modernizing, and developing human capital that can contribute to regional and global networks of production and value chains; Strongly restructuring administrative practices, providing conditions that are favorable for private economic to grow. The Government has also issued a variety of fiscal incentives for SMEs; establishing capital sources and production, encouraging trade and market knowledge, enhancing corporate governance skills and equipping employees with skill training. The SME Support Law by the National Assembly comes into force from January 1st 2018, regulates principles, contents and resources to support SMEs in production and business; duty of organizations and individuals with certain preferential regulations. Next, the Government issued Decree No. 39/2018 / ND-CP guiding the Law on SME Support with many State policies such as: Information support, consultation, human capital growth, business households transformation, innovative startups, business clusters joining and value chains. Therefore, the Government keeps paying attention and set bigger and more comprehensive targets in order to better the business environment. However, the proportion of SMEs participating in and benefiting from the State's policy support programs is still limited. SME support activities are not specific, lack of focus, and have not created industry linkages to promote SME participation. Besides, administrative procedures for SMEs to enjoy the State's support policies still have many shortcomings and difficulties.

5. Conclusions and solutions

5.1. Conclusions

Supporting industry development in Vietnam is a relatively new issue in both theory and practice. In terms of implementing the shortened industrialization strategy in Southern Vietnam, the theoretical research and experience of the industrialized countries work are essential. In the framework of this article, the author has given a new approach as a suggestion for the formulation of policies to promote supporting industries based on theories of industrial cluster theory and the theory of birth systems business ergonomics. With its important role, supporting industry development is becoming one of the key conditions for the development of a viable industry participating in the international labor division chain, successfully implementing the strategy to attract capital and technology sources from the developed countries into national industrialization and modernization.

Governments around the world often focus on issuing policies to support SMEs to assist in the early stage of industrialization and FDI attraction. Japan in the 1940s, for example; Korea, Thailand, and Malaysia in the 1980s. These policies revolve around the principle that SMEs are considered as a job-creating sector supporting many of the country's fundamental economic sectors, so they should be facilitated for development. Such policies often give priority to SMEs through equipment cost support, technology transfer, the promotion and / or forcing and / or forcing large firms and the Government to purchase SME products, validating the role of subcontractor as SMEs, establishing a state management organization to advise and manage SMEs promotion policies (Yoshiaki Takahashi, 2017; Dien, 2017). Although the lessons from SME promotion policies are diverse, the context and opportunities of each country are different from time to time, so policies need to be defined with reference to previous countries' experience and adjusted to suit Vietnamese characteristics. Following are some examples of SME promotion policies in the support sector that can be considered in the Vietnamese context: (i) There are central and local SME management agencies (Japan, Korea). (ii) Establishment of capital support fund for SMEs, establishment of credit guarantee units for SMEs (Japan). (iii) Establishing machinery and equipment support centers to help SMEs access new machinery and equipment (Japan, Korea, Thailand). (iv) There are specialized technology research institutes associated with universities to perform technology research functions in association with enterprises. There is a financial support mechanism for technology research projects associated with application and transfer to enterprises (Korea). (iv) Building talent development center (Malaysia), promoting SMEs to start a creative business. (v) Develop programs to promote linkages between SMEs and large companies by setting up DN product databases (Japan, Thailand). (vi) Human resource devel-

opment policy on the basis of linking between technology research organizations - enterprises. In particular, the research organization is located at a human resource training institution (Korea). (vii) Concretize preferential policies to support SMEs through national programs for each sector, each specific locality in terms of cost support, market, technology, premises, and training human resources (Thailand, Malaysia). (viii) Site support for SMEs such as high-rise factories (Japan).

5.2. Solution to build industry linkages to create conditions for SMEs to develop

Currently, the legal framework to support SMEs has been quite complete, but there are also many programs to promote industry linkages to attract SMEs to participate. It is necessary to establish a model production association, these models need support from the policy. First of all, it is necessary to find out the types of products that Vietnamese enterprises can produce domestically, with high demand for domestic consumption and export. The next step is to establish a value chain link model in production from market research, product design, and organizing satellite businesses to produce details, components, etc. and to setting up a distribution system of products to the market. In order for SMEs to boldly join the chain of products in the industry, the state needs to have supportive policies for them to boldly invest. Building a model of production association from market research, product design, satellite SME organization to manufacture details, components to establish a distribution system to the market.

Select an enterprise in the core activity group

In each industry group, enterprises operating in the “core stage” will be identified as having sufficient ability to conduct research, design and assembly of end products. This group of businesses will formulate a feasibility study project on the market, technology, human resources and financial efficiency aspects of the project, and at the same time prepare an investment plan (Dien, 2017). The feasibility study report for the production of the core products must detail the production organization model from market research to design, packaging, pasting styles, materials, to every detail, components of end products. Each detailed component must analyze the production capacity of domestic enterprises (specify the address of production and supply); details and components imported from abroad (specify the country of supplier). At the same time, clarify the costs of investing in technology transformation for participating businesses to provide details and components, as well as propose necessary supports. The final product manufacturing process will have many details and components from different industries. The “Core” enterprises will be given incentives and subsidies to transfer production technology of details and components to auxiliary suppliers. SMEs participating in the supporting product supply chain will be supported with interest expenses on technology transfer investment.

Production organization model in the chain

In order to manufacture the end product, the first step must be to research the market of each product group, thereby determining the required product attributes, on which the product is designed. After designing the final technical standards, the “core” enterprise develops a plan to link production with SMEs that provide auxiliary supplies. The plan to associate production of auxiliary products for end-products is only done by satellite SMEs, investing and supporting satellite enterprises to change technology to meet the production standards of machine parts. At the same time, detailed plans to support technology transfer and quality control of production details and components of private security enterprises are presented. To focus on production techniques, end-to-end product distributors are required. The units participating in the end product distribution will be supported with the trade promotion costs. The “core” enterprise creates a network of suppliers participating in the value chain that manufactures end-products. At the same time, actively supporting them to innovate production technology and techniques; technical regulations. Besides, always closely follow the progress of production testing, inspection and certifying product quality.

Policy to support enterprises to join production chain

For businesses to boldly join industry clusters, it is necessary to support business policies as follows: (i) First, tax incentives: Corporate income tax exemption for “core stage” businesses and SMEs provide ancillary products. Exemption from personal income tax for professionals participating in production projects of industry clusters. (ii) Second, support interest expenses for investment in construction of intermediate product factories and terminal product assembly. (iii) Third, support the cost of research and design of production of end products: Support investment costs for research centers and product design, product test; Support costs for hi-tech application contracts and technology transfer contracts. (iv) Fourth, support for consultancy on intellectual property, exploitation and development of intellectual property: Support costs for consultancy contracts on procedures for establishing, transferring and protecting intellectual property rights; consulting contracts on formulation and implementation of intellectual property policies and strategies; consulting contracts on design, registration for protection, exploitation and development of the value of trademarks, industrial designs and inventions; consulting contracts on construction and development of intellectual property for geographical indications. (v) Fifth, consult on standards, technical regulations, metrology, quality: Support costs for consulting contracts for the establishment of basic standards in enterprises; reducing the testing device sample fee and verifying fees, calibrating and testing measuring instruments and measurement standards; reduce the cost of quantitative marking of pre-packed goods in accordance with technical measurement requirements; Support the costs of consulting contracts for enterprises to organize their own measurement. (vi) Sixthly, support the implementation of production testing, verification, inspection and quality certification procedures: Support costs of testing, inspecting, product quality certification; Supporting the use of goods quality testing laboratories of enterprises participating in industry clusters and value chains; Reduce charges for goods quality testing at the testing systems of state management agencies; Support contract costs for institutes, schools to research and develop products and services. (vii) Seventh, support production and business linkage: Supporting the costs for consultancy contracts to promote “core” businesses to develop supply support satellites; Support the costs for consulting contracts on building business association projects to promote market development, improve the value of products and goods. (viii) Eighth, support for brand development, market expansion: Support for the cost of booths at National and International Trade Promotion Exhibition Support Association; to be given priority to participate in trade promotion programs using the state budget; Support costs for consulting contracts on branding, trade names, trade secrets; Support costs for contracts of information search, products promotion, brand development. (ix) Ninth, support the full cost of training human resources to participate in industry-linked production projects. Support training costs for technology transfer from “core” businesses to SMEs providing supporting products.

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