

Assessment of the Coronavirus Pandemic (COVID-19) Impact on Supply Chain and SME Manufacturing Firms' Performance in Malaysia

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Abstract— As the backbone of the economy, Malaysian SMEs are the most contributor to the economy; and many SMEs are in the manufacturing sectors. SMEs contribute to the employment and GDP of the country. Unfortunately, the recent coronavirus pandemic outbreak has heavily affected all businesses, including SMEs' supply chain functions- production/manufacturing, procurement, inventory/storage, and logistics/transport. This project investigated how the coronavirus pandemic outbreak affects supply chain and SMEs manufacturing performance in Malaysia due to limited empirical evidence. This research focuses on SME manufacturing firms located in Selangor and Kuala Lumpur (Bangi, Shah Alam, and Ulu Kelang). Total 17 SMEs manufacturing owner-managers (Eight sub-sectors) were interviewed based on an open-ended questionnaire using GoogleMeet Platform. The study adopted the thematic analysis (TA) to grab the interview themes regarding assessing the impact of COVID-19. The extracted 15 themes were coded into two major constructs- sustainable business strategy and Government policy and support and conceptualized a research framework. These two themes affect supply chain performance on four functions. This framework will contribute to body knowledge of supply chain management and policymaker with significant insight how to manage SMEs supply chain functions during and post-pandemic. Future studies can be done by removing the limitations.

Keywords— *CVID-19, Malaysian SMEs, Lockdown, Supply Chain, Manufacturing.*

1. Introduction

Regardless of the size of the economy be it large, small or medium, SMEs are the backbone of the

country's economy [1] as it has a wider role in the global economy [2-5]. Many countries achieved their high level of development through small and medium businesses [6]. Ref. [7] and Ref. [8] highlighted the importance of SMEs in economy such as a strong instrument of development, valuable input in the society, employment generating, and meeting up local demand of society as per their requirement and etc. A significant aspect of SMEs is that this sector generates 52% - 57% employment in developed countries and employment 61% in developing countries. A World Bank report (2020) showed that SMEs contribute 40% to GPD and 50% to employment generation [9].

SME manufacturing is described as having less than 200 employees and a sales turnover of less than RM50 million (approximately \$12 million) in Malaysia (ADB, 2018). SMEs may be categorised depending on a variety of important factors, including the number of employees, average turnover levels, and the size of fixed assets. However, the most commonly adopted criteria is the number of staff, but this criterion ranges across countries and within countries, with varying opinions on the precise number of jobs and the number to be used [10]. Similarly, the World Bank (2013) classifies a company as a MSME if it follows any two of the following criteria: microenterprises

hire up to ten people and have total assets and annual sales of up to \$10,000; small companies employ up to 50 people and have total assets and annual sales of up to \$3 million; and medium-sized businesses employ up to 50 people and have total assets and annual sales of up to \$3 million; and medium-sized businesses employ up to 50 people and have total assets and annual sales of up to \$3 million. Ref. [11] points out, the concept of SMEs is influenced by a variety of influences, including market culture and the scale of the country's population. Manufacturing companies in Malaysia are classified as SMEs if they employ less than 200 people and generate less than RM50 million (approximately \$12 million) in sales (ADB, 2018).

According to a report by Ref. [12], total number of SME firms is 907,065; of them 2.3% are medium, 21.2% are small and the rest are micro enterprises. The SME firms are 98.5% of the total business enterprises in Malaysia. In accordance with the subsectors, SMEs are services (89.2%), manufacturing (5.3%), constructions (4.3%), agriculture (1.1%) and mining and quarrying (0.1%). With respect to regional distribution, 19.8% of enterprises are in Selangor state, followed by Kuala Lumpur (14.7%) and Johor (10.8%).

Malaysian SMEs are predicted to have a contribution of more than 40% to national gross domestic product (GDP) by 2020 [13]. Supporting the prediction, SMEs contributed 38.90% to the national economy, which is 5.8% GDP growth (total GDP growth is 4.3%). However, SMEs contributed to national economy with 5.2% (overall 4.5%) in 2015; 5.20% (overall 3.7%) in 2016; and 7.2% (overall GDP 5.9%) in 2017. This growth trend showed fluctuations. The total contribution of SMEs to the country's economy is 36.6% in 2016 and 37.1% in 2017. Besides, SMEs are contributing 48.40% to employment in all sectors (agri, service,

construction, manufacturing, and mining etc.). This report also demonstrated that in earning foreign currency from exports SMEs earn 17.9% though in agriculture it is negative trend. Department of Statistics Malaysia reported that in the manufacturing sectors of petroleum, chemical, rubber and plastic products, etc., the annual growth (4.50%) was a little bit sluggish in 2019 compared to the growth (5.5%) in 2018. Similarly, basic metal and fabricated metal products, non-metallic mineral products showed growth of 4.9%, and the food, beverages and tobacco sub-sector had a growth of 3.2%: both these sectors experienced a slower growth rate in 2019 than in 2018 [14].

During the last 20 years the world has faced several economic crises. Covid-19 has caused a severe global shock [1] that has resulted in the world economic operations being stuck. Malaysia, instead, faced several natural, manmade and political and economic disaster and crises. COVID-19 transcended all the hazards it experienced in recent history. The coronavirus pandemic has caused mass deaths and misery across the globe. It is the greatest global health problem in living memory, and it has caused a significant economic slowdown, with development stopping in impacted nations, a decrease in demand and morale, and stock markets reacting adversely to increased instability [15].

Small and medium enterprises (SMEs) are among the hardest hit following the implementation of the MCO from March 18, 2020. With few exceptions, so far, limited empirical evidence is available on how the COVID-19 crisis impacted the supply chain capability and the performance of SME manufacturing firms across Malaysia. The policy makers need evidence to draw a plan on how to mitigate supply chain problems that effect business operations. There are mounting concerned of every

business, especially SMEs and end users, that need to be addressed urgently.

Supply chain issues need to be immediately solved, especially during the coronavirus pandemic, or the country may face problems with food security. Malaysia is still import dependent. As Ref. [16] quoted, "In 2019, the country had yet to reach self-sufficiency in the main foods, with self-sufficiency in rice at 70%, vegetables at 46.6%, beef at 23.9%, mutton at 11.2%, fresh milk at 61.3%, dairy products at 5%, and fruits at 79%. This has also caused a trade deficit that has been increasing from year to year". The policy makers need to take aggressive efforts to ensure the food supply chain will not be disrupted.

SMEs business sustainability is an issue. According to Ref. [17] and online survey conducted by the SME Association of Malaysia, only 37.8% have sufficient cash flow to sustain themselves through April 2020. The survey also found that SMEs really need a helping hand. Since March they have taken several measures to cope with the downturn in business. These include cutting down on manpower-related costs, seeking a cheaper raw material supply, as well as putting expansion plans on hold. Ref. [18] reported, and the SME Association of Malaysia predicted that about 200,000 to 300,000 SMEs (or up to 30%) may collapse over the next one year if the policy makers do not make a serious attempt to help SMEs.

Ref. [19] listed four distinct supply chain competences: 1) functional competence; 2) relational competence; 3) managerial competence; and 4) behavioral competence, by embracing supply chain capability and ability to influence firm performance. On the other hand, they also summarized that the supply chain competence analysis can be carried out at the individual level, intra-organizational level and inter-organizational level as the business wishes Apart from that, supply

chain capability can be described as the internal support system for every business that focuses on their core competencies that would include manufacturing/production, purchasing/material supply, inventory management and distribution-transportation.

Supply chain competency and capability is a key factor in achieving superior performance and competitiveness. Ref. [20] concluded that supply chain competency leads to business improvements both operationally and financially. Large firms in Malaysia depend on supply from SME manufacturing firms. Ref. [21] reported that 68.1% of SMEs are direct suppliers of large foreign firms in Malaysia; meaning that the survival of SMEs really contributes to the survival of the whole Malaysian economy. The focus on SMEs and SME manufacturing clearly requires more depth in terms of their survival not only during this health crisis, but especially in the aftermath.

The general objective of this study was to assess the impact of the coronavirus pandemic on the supply chain and SME manufacturing firms' performance in Malaysia. Specifically, the study aimed to examine the effect of supply chain capability (consisting of manufacturing/production, purchasing/material supply, inventory management and distribution-transportation) on firm performance. Thus, the study designed the research question: Does supply chain capability (consist of manufacturing/production, purchasing/material supply, inventory management and distribution-transportation) effect firm performance?

The current study proceeded with the following sections- literature review, methods, data analysis, results, discussion, and conclusions.

2. Literature Review

Supply chain management is characterised as the process of designing, preparing, executing, controlling, and tracking supply chain operations with the goal of generating net value, constructing strategic infrastructure, leveraging global logistics, synchronising supply chain demand, and evaluating global success. The supply chain focuses on distribution, sourcing, intelligence, and an automated approach to operations management. Supply chain management, on the other hand, is the method of getting a commodity from raw material to the customer. Supply planning, product planning, demand planning, sales and operations planning, and supply management are also part of this process.

Supply chain management is a vast activity under a pre-designed process. This study focused on the following four activities, which are affected most in the pandemic period:

Procurement process: Procurement process involves purchase order processing, receipt confirmation, and invoice verification. In purchase order processing, manufacturers complete procurement requirements through sourcing, issuance, and confirmation. The purchase department confirm with other departments in terms of quantity, quality and time. At the end of the procurement processing procurement the department or authority receives, checks and verifies the correctness of the vendor's invoice.

Manufacturing process or production process: This process starts with production planning or production scheduling and manufacturing execution. In production planning the production department specify the assigned production orders with production resources in a specified timeframe. Production execution confirms the production

information and supports the production control and costing process.

Inventory process: Inventory process includes inflow processing and outflow processing, warehousing, storage and inventory of goods. Inflow processing involves all raw material procurement processes once the goods are received. Inversely, the processed goods or final goods are scheduled and sent to the destination. The internal movement of goods fall into warehouse and storage activities. In physical inventory activities, the physical goods and its planning are involved.

Logistics or transportation process: The last activities of the supply chain process are to transport the goods to the destination. This process includes transportation planning, execution and the freight costing process. Transportation planning deals with an optimized and executable transportation plan.

2.1 COVID-19 and Malaysian SMEs

The coronavirus pandemic, which has now affected almost 2,915,269 people in 148 countries and killed over 203,020 people, has the ability to infect a significant portion of the global population [22, 23]. According to some figures, 40-70 per cent of the global population may be sick [24]. The recession has now morphed into an economic and labour market shock, affecting both supply (goods and services production) and demand (consumption and investment). Export disruptions began in China and have now extended to supply chains all around the world.

Companies, regardless of scale, are experiencing major challenges. Small and Medium-Entrepreneur (SMEs) are finding it especially challenging to maintain activities. On both the supply and demand sides, the coronavirus pandemic has a number of effects on the economy, especially SMEs. On the

supply side, businesses are experiencing a decline in labour supply and power usage. Furthermore, production chains are disrupted, resulting in components and intermediate goods shortages [25]. In Japan, 39% of respondents said their companies were affected by supply chain disturbances, while 26% registered a drop in orders and revenue. In the United States, 70% of people encountered supply chain disturbances, leading to an average crisis effect of 80% [25].

By 25 April 2020 a total of 5,742 Malaysians were infected with 98 deaths, 1,882 active cases and 3,762 total recovered cases [26]. The coronavirus pandemic has resulted in Malaysia taking necessary drastic actions to get people to stay at home, practice social distancing and for all business premises, save those providing selected "essential services", to close during this government's Movement Control Order (MCO) period.

From the end-user perspective, the current uncertain environment restricted their spending to essential goods and delayed investments. Many of them have had their wages cut or lost their jobs. A survey by Ref. [27] found that following the coronavirus pandemic and the government's MCO being enforced, 46.6 per cent of self-employed respondents had reported losing their jobs and an estimated nine out of 10 respondents were still working with lower than usual salaries. Thus, MCO effects incomes and the purchasing power of end customers [28].

From a business perspective, since the government's MCO, many businesses were unable to operate during this period. Some flexibility was given to ten essential services including food-based and logistics confined to the provision of essential services [29]. Those who can operate are experiencing a few disruptions of the supply chain such as raw material shortage, order deferment and

cancellation, and distribution and transportation disruption. This affected every channel in the supply chain. Ref. [18] projected that the impact of the coronavirus pandemic on the SME manufacturing sector will be more severe. The business operation is highly dependent on the supply chain. To produce one product, they may need to source the materials from different countries and manufactured products at different plants in a different country.

In terms of manufacturing, the current crisis has overwhelmingly impacted SMEs, exposing their susceptibility to supply and demand shocks (particularly in terms of liquidity), with a real risk that more than half of SMEs could collapse in the coming months. Furthermore, while consumer demand is poor, SMEs are more financially vulnerable and cash-strapped. COVID-19 has an effect on small businesses, materials, and distribution. As a result, SME retailers and hoteliers have seen a 30% decline in sales since January 2020 [30].

Many of the above factors point to a major negative effect on the world economy and the emergence of symptoms of a global economic slowdown. Forecasting the economic effect of this case is exceedingly complicated. According to the Ref. [29], the initial direct impact of the shutdowns may be a reduction in productivity of one-fifth to one-quarter in several countries, with consumer spending theoretically falling by one-third. The impact on annual GDP growth is projected to be a decrease of up to 2 percentage points per month.

Therefore, to minimize the immediate impact of coronavirus pandemic and in times of crisis, the Government of Malaysia has provided various stimulus packages to counter the economic impact of the coronavirus pandemic outbreak. The list of packages is listed as per Table 1.

The stimulus package is short term in nature. The SMEs and policy makers need to come out with a long term plan. The long term package and

implementation strategies may include spurring economic growth, promoting investments, and encouraging businesses to survive after MCO.

Table 1. Economic Stimulus Package

Announced Date	Package Name	Package Value	Targeted Segment
20 Feb 2020	2020 Economic Stimulus Package	RM20 billion (US\$4.8 billion)	aimed primarily at the tourism industry.
27 March 2020	Prihatin Economic Stimulus Package	RM250 billion	Individual
6 April 2020	SMEs Stimulus Package	RM10 billion	SMEs

Source: Ref. [31]

According to Ref. [32] and based on China's experience, businesses, including SMEs, may face bigger challenges reopening after quarantine or MCO. First, with respect to local quarantine policy, not all states will achieve 0 positive infected cases at the same date. There will be recurrence cases. If one coronavirus pandemic case cluster shows up in the state, cities or businesses may need to close for a longer period. Second, with respect to business-reopening permits and health regulations, many SMEs will struggle to meet the coronavirus pandemic health and prevention requirements by the government. Third, with respect to a collapsed

supply chain and logistics, upstream SME closures have an effect on downstream factories that depend on the parts they manufacture for SMEs. Many manufacturers may only manufacture or have no room to store goods without the parts and require logistics to carry in materials and send out products. Because of the current outbreak and numerous travel restrictions, several foreign shipping firms are taking their time returning to work. Therefore, the policy makers, including the government of Malaysia, must come up with a robust plan to control the coronavirus pandemic and jump-start the economy. This needs to be done concurrently.

Table 2. Economic Stimulus Package

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Source

2.2 SMEs Manufacturing in Malaysia

Based on the latest Economic Census (2016), the Department of Statistics in Malaysia reported that in 2015 there were about 907,065 SMEs in total operating in Malaysia. SMEs represent the vast majority (98.5 per cent) of the business population

with a contribution of 38.3 per cent to overall GDP, 17.3 per cent to total exports and 66.2 per cent to overall employment [33]. The highest establishment category is micro size at 76.5 per cent followed by small size at 21.2 per cent and medium size at 2.3 per cent. Data also showed that micro enterprises have contributed significantly in expanding the growth of SMEs in Malaysia (Table 2) [34].

SME establishments are heavily concentrated in the services market, which accounted for 89.2% (809,126 firms) of overall SME establishments. Meanwhile, engineering employs 5.3% of SMEs

(47,698), building employs 4.3% (39,158), agriculture employs 1.1% (10,218), and mining and quarrying employs 0.1 % (865) [35].

Table 3. SMEs' Contribution to Country Growth Indexes (Value in '000)

No	Description	2015					
		SMEs				Large Enterprise	Grand total
		Micro	Small	Medium	Total		
1.	Growth and Economic Activity						
	Value of Gross Output (RM million)	144	437	427	1007	1484	2490
	Value of intermediate input (RM million)	65	241	282	587	921	1507
	Value added (RM million)	79	197	146	420	564	984
2.	Total establishment	694	193	21	908	14	921
3.	Value of Asset (RM million)	175	206	204	584	1015	1599
4.	Salaries and wages (RM million)	26	62	42	129	118	246
5.	Total employment	1938	2352	1364	5653	3080	8733

Source: [DOSM, 2017 #4433@author-yearauthor-year]

SME value addition rose to 5.5 % in the industrial industry (2017: 6.8 %). Petroleum, chemical, rubber, and plastic goods contributed the most, with a growth rate of 5.8% (2017: 4.4 %). The non-metallic stone, base metal, and manufactured metal goods sub-sector increased to 6.9% (2017: 6.1%), whilst the fruit, drink, and tobacco sub-sector decreased to 3.6 % (2017: 11.0%) [34].

2.3 Theoretical Background

Supply chain management theories: Supply chain management and its functions can be explained through theoretical aspects such as resource-based view (RBV), transaction cost analysis (TCA), knowledge-based view (KBV), total quality management (TQM), and consumer relationship management (CRM). This current study is underpinned by the resource-based view and dynamic managerial capabilities theories considering that the most relevant to the research objectives.

2.3.1 Resource based view and Dynamic Managerial Capability

Researchers have concluded that understanding the fundamental organisational skills that empower companies to mobilise, reconfigure, and allocate capital to build competitive advantage will help us better understand resource-based advantages [36, 37]. Indeed, the principle of organisational fit is a core tenet of the RBV theory, which means that organisations are only likely to gain sustainable competitive advantage if they can bring potentially beneficial capital to effective use [38].

The literature on complex managerial skills presents a theoretical basis for resolving any of these deficiencies in the RBV-based entrepreneurial strategy. The literature on diverse management skills has arisen to investigate how a broad range of qualities and characteristics of senior leaders influence an organization's resource advantages [39]. The mechanisms through which corporate leaders successfully create, establish, expand, recombine, and execute organisational capital to achieve structural transformation or overcome shifts in the external marketplace are known as dynamic

managerial skills [39, 40]. Because of their rank and status, which affects the actions of other leaders in the company and places them in charge of resource distribution and strategic strategy, CEOs have been seen as particularly important for developing, reconfiguring, and deploying organisational capital [36, 41]. CEO dynamic managerial skills, in particular, allow organisations to efficiently spot external business opportunities that fit with corporate capital, reconfigure and distribute organisational resources to pursue market opportunities, and empower workers to align resources to promote strategic improvement initiatives [36, 39].

An organization's adoption of a new concept or action is known as organisational change [42, 43]. Organizational change is a difficult method that depends on the use of organisational competencies. A business, according to the RBV framework, is a set of tools and competencies that can be used to achieve a competitive edge by strategy execution. Centred on RBV, [44] stresses the value of operational competency growth for market transformation.

In order to resolve a gap in their capabilities, many organisations would incorporate improvement into their processes [45]. Management strategies constantly place a premium on the firm's operational capabilities and finances [46]. Models may assist organisations in identifying differences between expected and realised results. The RBV is one such model, which notes that the firm's approach and potential to achieve above-average returns are focused on the corporate uniqueness of its capital and skills [45].

After significant works by [47- 49], and others, RBV originated as a method for gaining competitive edge in the 1980s and 1990s. Supporters of this view claim that instead of searching externally at the

global market for outlets of competitive benefit, companies should search inside their own walls. According to supporters of RBV, it is much more practical to leverage external openings by repurposing current resources rather than acquiring fresh skills for each opportunity. Tools are assigned a significant position in the RBV model in assisting organisations in achieving higher operational efficiency.

Financial equipment, individual job expertise, patents, finances, and talented management are examples of tools that go through a company's manufacturing phase. Furthermore, the wealth of a company can be divided into three categories: physical, financial, and organisational capital. These properties can be both concrete and intangible in nature [49]. Ref. [50] proposed that competitive advantage is derived from the firm's desirable capital, which are mostly intangible assets such as resource abilities and credibility. However, alignments must be made since all visible and imaginary artefacts will, and often do, carry negative and positive connotations [51].

The heterogeneous and immobile nature of resources is one of RBV's two main assumptions. The first assumption is that organisations' expertise, capacities, and other resources vary from one to the next. Organizations should not use various tactics to outcompete each other if they have the same amount and combination of capital. What one organisation does, the other will easily copy, and there is no way to gain a comparative edge. This is an ideal competitiveness situation, but real-world economies are far from perfect, and certain firms that are subject to the same external and internal pressures (same external conditions) will execute different policies and outperform one another. As a consequence, RBV believes that businesses obtain a

strategic edge by integrating their multiple capital packages [49, 52].

The second assumption of RBV is that, at least in the short term, services are not mobile and do not switch from one company to another. Companies can't duplicate competitors' capital or use the same tactics because of this immobility [49, 52]. Brand equity, processes, knowledge, and intellectual property are examples of intangible properties that are typically immobile.

3. Method

3.1 Research Team

The research team was formed with three members: a. A professor in marketing and supply chain management, a PhD candidate pursuing a supply chain management studies and a PhD candidate in marketing.

3.2 Participants (Informants)

The participants were from a sub-sample of SME manufacturing companies. These interviewees were either owners, chief executive officers (CEO) or managers of the firms. A total of 19 interviewees were interviewed online using Google-Meet. From these two were outside of the subject matter and were discarded from the data analysis. The following tables showed the socio-demographic information of the participants. In Table 3, from the eight subsectors of manufacturing SMEs, two were automotive firms: one firm deals with supplying and assembling of automotive glass to Proton (windshield, rear windshield, whole and triangle glass for Persona, Proton & Iriz); and another one is managing director (MD) of a car manufacturing company. The electric and electronic sector includes electronics and electrical items of home appliances components, and audio visual electronic products. The four firms in the food beverage sector include

cake manufacturer, coffee, chicken, potatoes, bananas, sweet potatoes and vegetables. Here the agriculture sector is included. One firm involved in the furniture sector dealt with office furniture. The metal fabrication sector includes steel and metal engineering, and advertising. The two firms involved in the oil and gas sector were from oil and gas service and oil engineering. The paper printing sector includes stickers, boards, etc., which are made of paper and printing on signboards, posters etc. The textile sector includes cotton, yarn, cloths, garments etc. firms.

Table 4. Sector Wise Sample (n=17)

SN	Business Sector	Frequency
1.	Automotive	2
2.	Electrical & Electronic	1
3.	Food and Beverage	4
4.	Furniture	1
5.	Metal Fabrication	2
6.	Oil and Gas	2
7.	Paper Printing	3
8.	Textiles	2
	Total	17

The study investigated the business sector and their income level. Three firms had income levels of less than one million Malaysian Ringgit and five firms earned more than MYR 10 million yearly (Table 4). As shown in Table 4, two firms had more than 20-year business operation experience; and two firms had less than five years' experience. Table 4 depicts the sector and employee numbers where five firms had less than ten employees working in the firms and four firms were found to have more than 50 employees, out of 17 firms.

Table 5. Business Sector with Income (RM in Million) and Operating Year

Business Sector/	Income					Year Business Operation Year					Number of Employees					
	<1	1-5	6-10	>10	N/A	Total	1-5	6-10	11-15	>20	Total	< 10	10-50	> 50	NA	Total
Automotive				2		2	1			1	2		1		1	2
Electrical and Electronic					1	1				1					1	1
Food and Beverage		3		1		4		3	1		4	1	2	1		4
Furniture				1		1		1			1			1		1
Metal Fabrication	2					2	1		1		2	1	1			2
Oil and Gas			1	1		2				1	2		1	1		2
Paper Printing	1				2	3			2		3	2			1	3
Textile			1		1	2			1		2	1		1		2
Grand Total	3	3	2	5	4	17	2	4	5	2	17	5	5	4	3	17

3.3 Procedures

The study adopted a semi-structured interview protocol to cover a range of topics relevant to SME supply chain process and its capabilities (procurement capabilities, manufacturing capabilities, inventory capability and logistic capability). The participants were communicated with a request to participate in the interview. In the beginning the research team was planning to interview in-person; however later the Malaysian government imposed a second movement control order (MCO). As a result, the instrument was structured to interview online through Google-meet. A semi-structured questionnaire was developed from past literature. In the questionnaire there were three sections: a. socio-demographic information; b. business organization information; and c. specific questions on the impact on COVID-19 SME supply chain and business performance. The last sections had three subsections: i. SME supply chain process (procurement, manufacturing, inventory and logistics capabilities), ii. Business performance, and iii. Government role and initiative.

The research management centre of Putra Business School approved the questionnaire before the interviews were conducted. The interviewees were sent a formal request letter to participate in the interviews. With their permission the research team scheduled the interview sessions at the interviewee's

convenience. Every session was supposed to take 45 minutes and this was successfully done. Before the session the moderator again explained the purpose and some key rules for this interview and sought the permission to record the session for further information. The 19 interviews took two months to complete.

4. Data Analysis

The study adopted the thematic analysis (TA) to grab the themes of the interview regarding the assessment of the impact of COVID-19 on SME supply chain and business performance. As recommended by [53], the study utilized a multi-stage standardized thematic analysis to code and interpret the interviews. The video interviews were transcribed accordingly and properly into text by a research assistant and double-checked for transcription errors or misinterpretations of the dialog by another team member. The 19 transcript were extracted into 19 documents (separately). All documents were compiled in a single document according to the questions. Two team members (one professor) familiarized themselves with the content and identified initial "codes" or identifiers of the most basic meaningful semantic elements (logical elements). Guided by inductive reasoning, codes were then sorted and grouped based on similarity, and similar codes were combined to form

overarching “themes.” The entire research team met to review each preliminary theme based on internal homogeneity and external heterogeneity [54], as well as the extent to which the themes related to the data set as a whole.

After reaching a consensus, the final themes were named and defined. After having coded the themes, the first author and second author marked the with themes whether they agree to disagree. The coder’s on agree and disagree was checked for agreement under theme for their agreement. The Cohen’s value was 0.832, which is very good inter-rater reliability, according to Ref. [55] and Ref. [56]. The second and third authors picked up some vibrant and significant statements as quotations for each theme. The study aimed to identify the prevalence of phenomenon from the semi-structure interview. The study also attempted to discover the existence of the phenomenon over their frequency.

4.1 Results

The study was conducted on 17 SME manufacturing firms from eight sectors. The demographic and SME profile findings showed that the business experience of the owners and managers amounted to at least four years with the highest being 26 years. The lowest number of employee were three in paper printing sector and the highest number of employee were two hundred in electrical and electronics engineering. The lowest annual income was found at MYR 100k in metal fabrication and the highest annual income were MYR 500m in electrical and electronics engineering sector.

As shown in Figure 1, findings related to SMEs’ supply chains and its function showed that, overall, the manufacturing capacity of all 17 firms were affected by COVID-19. The sector-wise results showed that automotive, electrical and electronics, food and beverage, metal fabrication, oil and gas, furniture, and paper printing sectors were severely affected by COVID-19, and the textile sector had a mixed effect. Of the two textile firms, one firm was affected severely, and the other one had less impact. In the area of procurement capability, all firms (17 firms) were influenced by COVID-19. Among these individual sectors, two sectors, namely automotive and textile sectors, had the least negative impact caused by COVID-19. Other sectors like electrical and electronics, food and beverage, metal fabrication, oil and gas, furniture, and paper printing were largely affected. Another supply chain function-inventory management capability was found to be affected due to this pandemic. Sector wise- automotive, electrical and electronics, food and beverage, metal fabrication, and oil and gas, furniture, and paper printing sectors were the worst impacted; with the paper printing and textile sectors being the least affect by COVID-19. Another function of supply chain - logistic capability showed that although the overall logistic function has been affected, the paper and printing sector had a mixed effect. Among the three paper and printing sector, one firm has been affected worst and two firms have least negative effect.

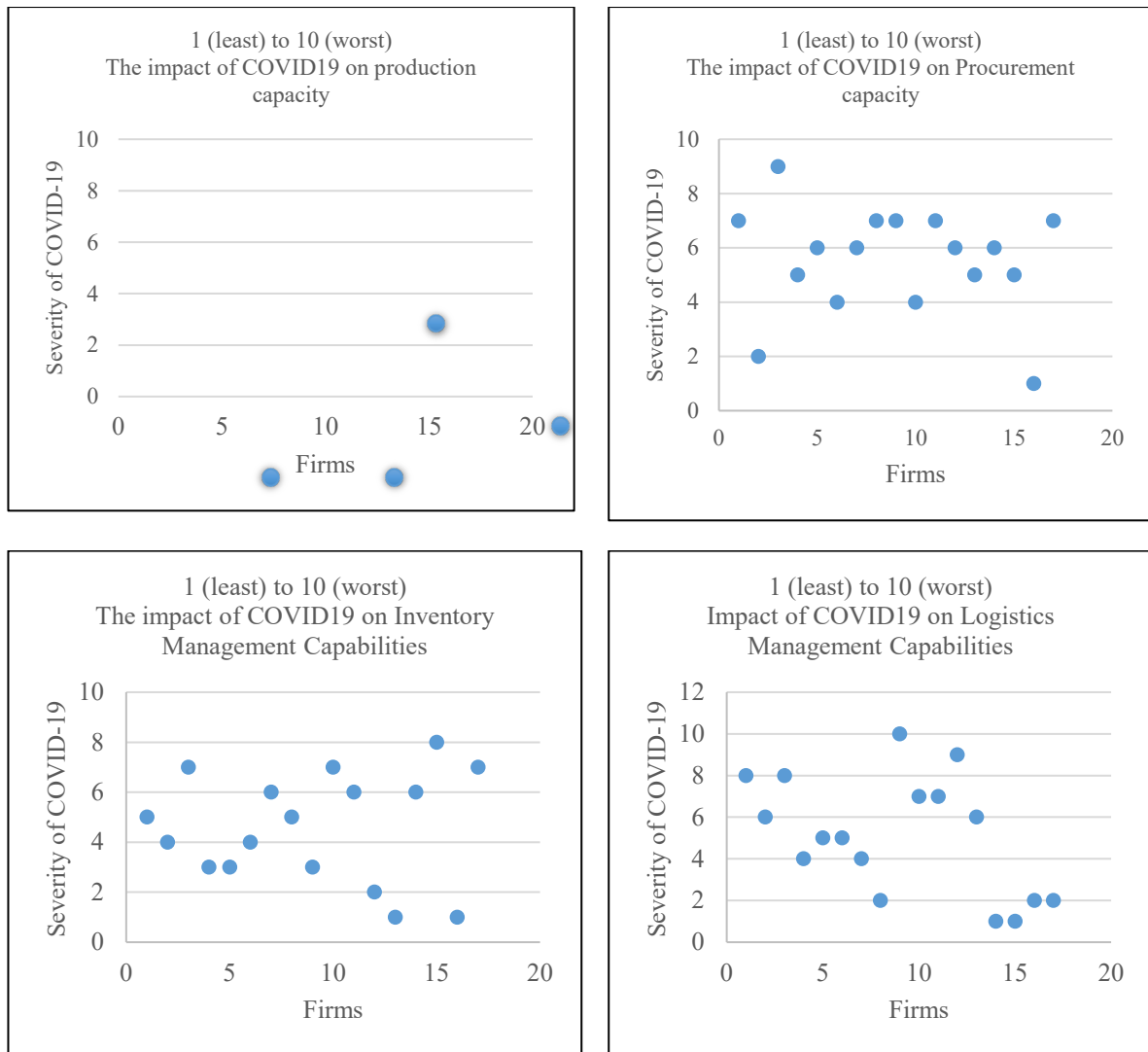


Figure 1. Impact of COVID-19 on Four Functions of Supply Chain Management

Overall, SME function was affected due to COVID-19. Among the functions (procurement, production/manufacturing, inventory and logistics), inventory capacity was least affected whereas manufacturing or production capacity was hampered severely. The logistic and procurement activities were affected mediocrecly (Figure 2).

The study investigated on various sectors of SMEs. The results showed that the electronics and electrical sector was affected the most severely followed by metal fabrication and automotive sectors. On the other hand, the textile sector was affected the least, followed by the paper and printing sector (Figure 2).

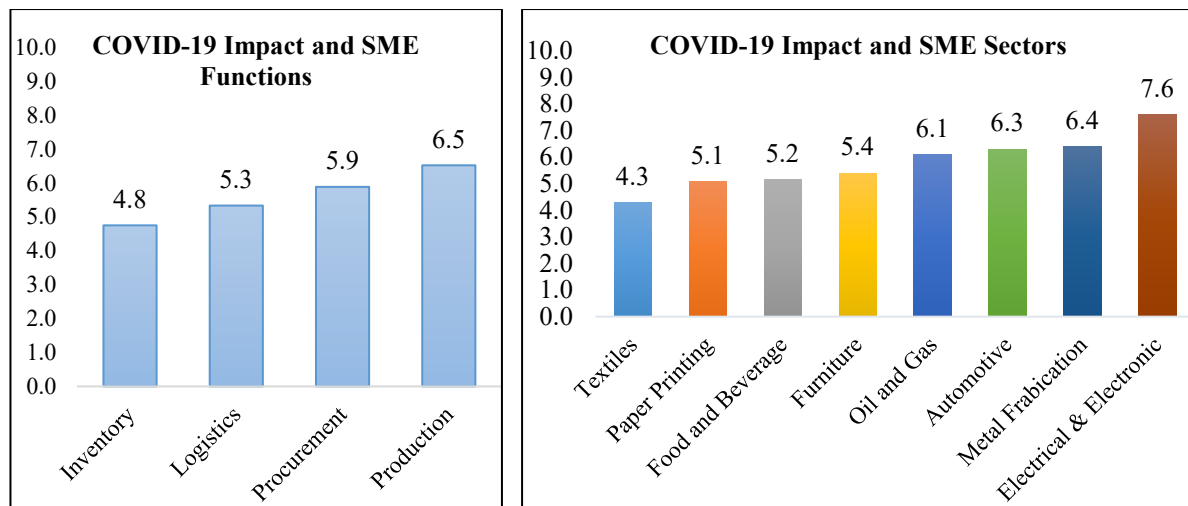


Figure 2. Impact of COVID-19 on overall SME's Four Functions and Eight Sectors

The objective of the study was to investigate the degree of impact of COVID-19 on supply processes of SMEs. The interview responses were broadly categorized on two themes: a. business sustainability strategy; and b. government support and policy. By business sustainability strategy, the respondents described the business planning, strategy and activities to operate a SME business over a long period of time. The participants, in their government support and policy theme, described the role of government and business policy to facilitate the SMEs' supply chain activities. These two themes are viewed from two perspectives: the first theme is related to a SME's business internal plan and activities, which are of daily basis to yearly activities and plan to survive in the long run. In the second theme, SME businesses expect the government to take some steps in local and internal business policy for facilitating the supply chain activities.

4.2 Theme 1: Business Sustainability Strategy

Business sustainability strategy mean that SME businesses' internal plans and activities are of a daily basis to yearly activities and plan to survive in the long run. This theme is structured in several sub-dimensions:

4.2.1 Theme 1.1: Business Sustainability Strategy: Entrepreneurial Strategy

The participants placed the most emphasis on the wise use of cash and resources. During the COVID-19 many firms suffered from a lack of hard cash. Ready cash was very necessary for transactions and to settle some payments. Other cash-convertible assets were found difficult to encash. Therefore, a certain amount of hard cash is considered a requisite to operating a business. According to the respondents' opinions, a SME entrepreneur needs to be a good planner. They will always observe the market and industry and find the suitable scope to concentrate on those scopes. For their sustainability, they feel that they are always required to learn; they need to learn new skills relevant to their current business. These new skills include new technology knowledge, new ideas generation, etc. One of the respondents reiterated strongly that in SME business even with fewer assets and capital they need to be able to compete with giant firms, often foreign firms. Therefore, there is no alternative but to be professional. They also need to collaborative with others. Their experience surfaced that collaborative strategy can minimise the risk and widen the opportunity. SME business people face many obstacles such as shortage of funds, less revenue due

to less demand, manmade and natural hazards, and employee betrayal. Even then, they should not stop, should not give up. This persistence mentality is very vital for SME business, especially in any disaster or epidemic. They suggested being stronger in pandemic situation by mentioning...

“...Don’t give up.”... “Wise use of money.”

4.2.2 *Theme 1.2: Business Sustainability Strategy: Internal Business Strategy*

A business operation is a dynamic activity. The respondents mentioned that for improving and increasing efficiency a smaller and short range activity is essential. With a proper plan, starting a small operation will bring success. They suggested that during an epidemic survival is a challenge and with small range operations the firms should enhance the efficiency to fight bigger operations by enlarging the scope. Once efficiency is earned and is sufficient to fight the financial and business recession, any attempt to increase the manufacturing scope and, if needed, importing large and new machinery, is welcome. New and large machinery will increase the production capacity, and with large product/yield SMEs can meet more demand, which is necessary during a pandemic situation. Every pandemic and disaster teaches new things to business people, which develops the learning curve for SME entrepreneurs. They learn how to adopt or attempt to adopt the changes for long-term business operation (sustainability). In the interviews with the SME entrepreneurs they stressed the importance of adoptability to change. They defined the techniques of adoptability as the generating of new ideas for solving the evolving problems. New ideas may include developing new products according to customer demand or supply chain members’ requisition; new processes for faster production or faster product movement; and new idea for adopting new technology. These new ideas will ensure SME

growth and efficiency to compete with larger and/or international brands/companies.

“We, people, attempt to change or adopt new ideas for business growth and sustainability”.

These internal business strategies will surely increase the possibility of sustainability.

4.2.3 *Theme 1.3: Business Sustainability Strategy: Financial Strategy*

The pandemic COVID-19 teaches the economy of a country how to survive in the critical time. Articulate financial management during the pandemic can help the firm survive, otherwise it will suffer from financial crisis. Proper financial management starts with reducing cost. The respondents agreed that a reduction in business operating cost will withhold them from collapsing the business; and to earn financial efficiency, the managers or owners must project the financial transformation.

“Cost, cost, cost, and cost. ... to reduce the cost of fixed cost, operating cost, inventory cost, and transportation cost.”

They must learn to predict or estimate the future cost and revenue and develop financial projections. They also admitted that cost minimization is the first and foremost criteria to achieve financial efficiency. Cost reduction is possible in nominal cost and fixed cost items. Some of them suggested reducing the fixed cost such as warehouse rent, unused building or space rent, unused lorry or vehicle rent. Nominal or variable cost is reduced through downsizing employees in all phases of the supply chain, reduction of working hours of employees, sharing the transport service, etc. The respondents emphasized maintaining systematic cash flow; and one of the participant strongly suggested controlling the cash flow:

“Maintain systematic action plan for cash flows.”

In the case of a cash credit loan, interviewees suggested maintaining or minimizing the credit balance to reduce the interest amount; and focused on maintaining a calculative balance of payment with both suppliers and customers; and undertaking a cost cutting exercise such as no allowances, no bonuses or no increments is recommended. One of them suggested an aggressive approach reasonably increasing the selling price.

4.2.4 Theme 1.4: Business Sustainability Strategy: Employee Management Strategy

Employees are the drivers of the firms, especially small and medium firms. In most cases, SME success depends on the performance of their employees. There was consensus among all the respondents that employee performance and their motivation may confirm sustainable growth of SMEs. Particularly in the SME supply chain process (procurement, manufacturing, inventory and logistic capacity) employees contribute the lion's share of its success. They suggested maximizing employee benefit, their safety and security during the pandemic and assuring their job security. Motivating the employees can sustain business growth even in the inverse situation. They unanimously mentioned to care for the employee.

“...Polish your wheels (employees) to run far and fast”

As many firms offer bank loans or credit facilities during pandemic and afterwards, the employees must enjoy the moratorium benefits for a reasonable time period. Job security and moratorium benefits can confirm business growth and sustainability of a SME's supply chain performance.

4.2.5 Theme 1.5: Business Sustainability Strategy: Business Alliance

The participants opined that SME businesses hold less capacity in terms of assets, skills, experience and cash. Many large projects or multiple projects

are unreachable for them. Here, a joint venture is a possible solution. During the pandemic SME entrepreneurs prominently lose their capacity. Business alliance or accumulation of collective experience and common funds enhance their capacity. Joint ventures may be between/among local firms or international firms or brands [57, 58]. They prefer local partners to facilitate business scope and sustainable business growth. In joint ventures they can offer fund facility, on credit purchase, fleet sharing, customer demand facilitating, etc. An important part of business alliance is handling and managing logistics issues with all parties involved.

“...Collaborate with all parties and partners.”

They also specified business alliances as sub-contracts of third parties for logistics activities. Two of the 17 interviewees suggested the collaboration with other parties in the whole supply process.

4.2.6 Theme 1.6: Business Sustainability Strategy: Marketing Strategy

The respondents were concerned about their marketing strategy i.e. maintaining customer demand, better quality of products, product development, and exploring new market segments. In marketing strategy, they also suggested making an all-out effort to increase sales; placing emphasis on advertisement and publicity. In normal times, both modes of advertisement (online and offline) are applicable and fruitful. Similarly, they opined to confirm online and offline advertisement to attract more customers. Always finding a new market scope or segment is a very beneficial strategy in marketing. These possible market segments can be served in critical times such as a pandemic. As customer choice and taste changes over time, one important strategy is to specify their demands (both existing and latent) and develop products accordingly. This is surely applicable in a pandemic situation. In times

of crisis it is very difficult to find new market segments, new product development or new ideas: rather it is essential that firms to have an alternative plan for developing a new product to meet customer demand to create customer demand and manage customer buying behaviour. They should have a plan to go globally. In Malaysia there are some effective government agency such as MARA, MATRADE and MAJU who can help to market products globally.

4.2.7 Theme 1.7: Business Sustainability Strategy: Documentation and Information Strategy

During the interview sessions the participants focused on documentation and information. Keeping and collecting updated and timely information is very significant for making the right decision. As

every transaction and information shared must be stored for further use it is important to sort the document and information into categorisations as unreliable and insignificant information and document may cause disturbance. Thus, their opinion is to have good and proper documentation of every business event or transaction as the timely and accurate information on business, competitors, government policy and even customers may help business growth [59, 60]. They also warned not to trust fake news, rumours, and unreliable word of mouth. They observed that during the COVID-19 pandemic there was a lot of fake news and false information that distracts them from their business activities and plan. As the world was in a fix, the SME entrepreneurs lacked accurate and appropriate information.

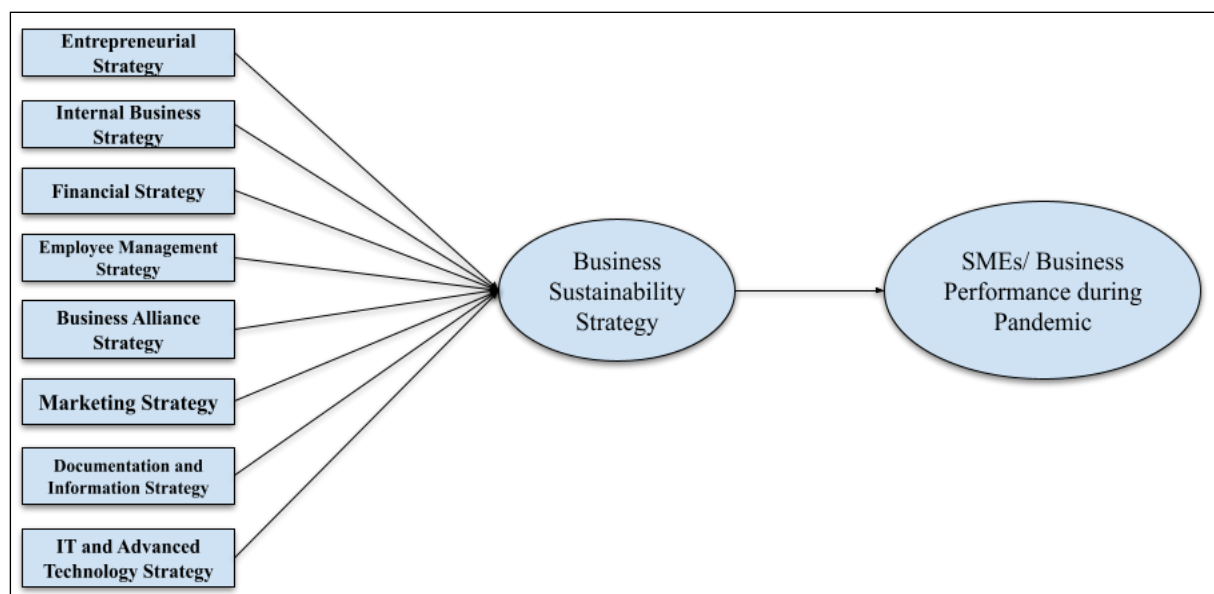


Figure 3. Theme 1- Business Sustainability Strategy

4.2.8 Theme 1.8: Business Sustainability Strategy: Strategy related IT and Advanced Technology

This is an age of information, technology, Internet, and social media. The respondents showed the reason behind opening a website, 24-hour service seven days a week, and online interaction with customers and suppliers. They opined that an online

platform may create a new horizon in SME business, especially during the pandemic and post-pandemic. A digital base for the business minimizes business risk [61]. Developing a webpage and website, opening online product sales, 24-hour service system, and (in some cases) artificial intelligence will facilitate business opportunities. Involving social media will expedite the business scope at a

high rate. Therefore, their suggestion is to develop a digital base.

4.3 Theme 2: Government Policy and Support Strategy

SME businesses expect the government to take some steps in local and internal business policy for facilitating the supply chain activities.

4.3.1 Theme 2.1: Government Policy and Support Strategy: Agriculture Policy

Agricultural products like food items and beverage items, crops, etc. are in the SME agricultural sector. Government policy is supportive of farmers. One of the respondents mentioned that there should have spaces for local farmers in shopping complexes and showrooms. Their opinion is that local farm products compete with international brands. In many larger shopping complexes, markets and displays, international brands get prioritized spaces but local farm products are rarely displayed. Providing a space for selling local products will enhance the propensity of local brands on the international market. Many Malaysian farmers are blacklisted for some reasons. The interviewees supported the blacklisted farmers. They mentioned...

“Even blacklisted farmers should be given loan and land”.

In natural calamities, particularly during pandemic, these farmers should have been redeemed and sent back to their lands and offered agricultural loans the stability of agricultural yields. In this regard, the government should restructure its policy to facilitate those farmers.

4.3.2 Theme 2.2: Government Policy and Support Strategy: Business Promotion Policy

Government policy should expand to facilitate the start-up business (SMEs). Government is expected

to formulate policy for younger stars who endeavour to open new business. These incumbent entrepreneurs need financial support, loans and tax exemption in some cases. Although the existing policy is workable, considering the pandemic situation the policy should be more relaxed. Government may organize a fashion expo or facilitate the authority to organize an international fashion expo. Shopping malls should include local brands with international brands. Government policy may be imposed to allow the ratio of keeping both brands - local and international brands - in shopping malls, showrooms, etc. The participants also mentioned the importance of government policy to expand the opportunity for local brands in the global arena. Government can negotiate or facilitate to expand local brands with Amazon, Alibaba and other e-commerce and online market places worldwide [61]. Government policy to boost business promotion in the local surface and the international arena is essential for sustainable business. They stressed government's role in expanding online business...

“... require Govt. help to expand the business to Amazon, Alibaba and etc.”

4.3.3 Theme 2.3: Government Policy and Support Strategy: Financial Policy

Most of the respondents emphasized the need for financial assistance and government policy during the pandemic. They felt the necessity of financial help for proper business operations. They expected an extended subsidy for entrepreneurs and their employees. They suggested the introduction of salary compensation of MYR1,000 to MYR2,000 per employee for small firm and more compensation for big firm in government financial policy. Government policy also needs to extend the help to M40 people and B40 people. Government grants should be made easier to be sanctioned. This government grant should be for creative industries,

with a moratorium policy on helping worker's salary. There was consensus among all interviewees that bank loans should be easier to receive, the terms of loan should be flexible for customers, and the loan amount should be increased. There were many cases found where an eligible loan applicant did not receive a bank loan for silly reason. They also emphasized the need for government grants and bank loans...

“...Make easier for government grant;Bank loan should be easier to get.”

Loans are very essential for the business people for operation. The participants suggested that government should concentrate on BPN and PENJANA. The terms and condition must be applicant-friendly. Moreover, farmers should be given more land for cultivation to increase production. Government should introduce a policy for the welfare of farmers.

4.3.4 *Theme 2.4: Government Policy and Support Strategy: IT and Digitalization Policy*

The interviewees surfaced the significance of IT and digital platforms for SME business. They expected more digital platforms. They also expected that internet facilities should be extended and be more comprehensive. One of the respondent says,

“... Government should provide Internet package and Internet equipment free to work from home facility. ...”

In the respondents' opinion, Internet and electronic devices should be priced lower and be made more available so that people can work conveniently from home and outside. In this pandemic, people felt comfortable working from home and outside.

4.3.5 *Theme 2.5: Government Policy and Support Strategy: Local Trade Policy*

Government can only facilitate local trade policy for the welfare of local business specially SMEs. They opined that many business people are under CTOS cases. Their business operations are interrupted. As the pandemic is a national and international crisis, everyone can contribute to recover from this crisis. For all-out effort from all parties, they say,

“.... All CTOS cases should be examined thoroughly to help business people more. ...”

They also suggested that the local economy should be open and all restriction on facilitating the business operation should be withdrawn.

4.3.6 *Theme 2.6: Government Policy and Support Strategy: International Trade Policy*

The participants mentioned that many types of raw materials need to be imported from foreign countries. These imported raw materials are costly and take a long time to be delivered. They opined that government should attract foreign direct investment (FDI); and suggested that government should provide a subsidy for raw materials. Their other requirement is the reduction of taxes and excise duty on imported raw materials to facilitate procurement and the production capacity of SMEs [62]. Moreover, international trade relationships with other countries and foreign business agent need to be developed and extended with the help of government involvement.

4.3.7 *Theme 2.7: Government Policy and Support Strategy: Information and Database Management Policy*

Government makes business and trade policy for the improvement of business and facilitating the business people. SME businesses are facilitated by government decisions. Such decisions or policy

would be more fruitful and effective if based on scientific data and information. One of the respondents also stressed that the information or data on which government makes business policy should be relevant. This respondent mentioned...

“Policy must be relevant and based on scientific data/facts/information.”

They believe that some decisions made by government were not based on scientific data or information and as a result, that policy did not work as well as expected.

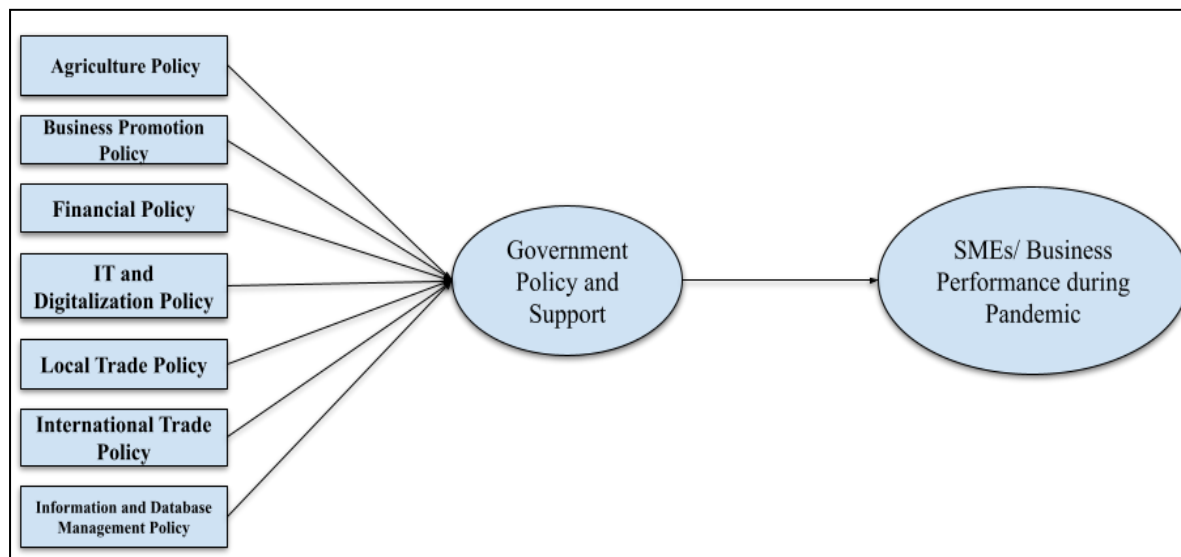


Figure 4. Theme 2- Government Policy and Support

4.4 Proposed Model

According to the respondents' opinions and suggestions from the different small and medium enterprises (SMEs) on supply chain functions, the study comes up with a proposed model (Figure 2). The model explains two broader themes, namely, sustainable business strategy and government policy and support. These two broader constructs will determine the SME performance in manufacturing/production, procurement, inventory/storage, and logistics/transport capacity. The sustainable business strategy means the activities and plans to facilitate the SME business and its supply chain function and confirm business revenue and profit during any manmade and natural calamity. Sustainable business strategy includes the entrepreneurial strategy, internal business strategy, financial strategy, employee management strategy, marketing strategy, documentation and information strategy, IT and technology strategy from the participant's experience. Only business plans and

strategies are not enough to sustain during and post-pandemic situations; instead, the government is the principal custodian to assist the business people and facilitate their activities to enact the economy. According to the interviewee's opinion, they suggested the government role as the second contributor. The government's role, namely, government policy and support, meant the government's business policy and the government's support in the economy to facilitate the business and supply chain operation. This theme includes several factors that may affect SMEs' growth and development in normal and pandemic situations. This second broader theme conceptualizes the agriculture policy, business promotion policy, financial policy, IT and digitalization policy, local trade policy, international trade policy, and information and database management policy. The model entirely approaches four supply chain functions- manufacturing, procurement, inventory, and logistic capabilities. Natural and manmade

hazards affect these two broader themes (two constructs or factors).

This study's goals were to provide a robust description of SME individuals' experiences

(manager, owners, and managing director), characterize the master narratives explored in their narration, and describe how they face constraints during the pandemic. Participants described "the pandemic" from their perspective and experience.

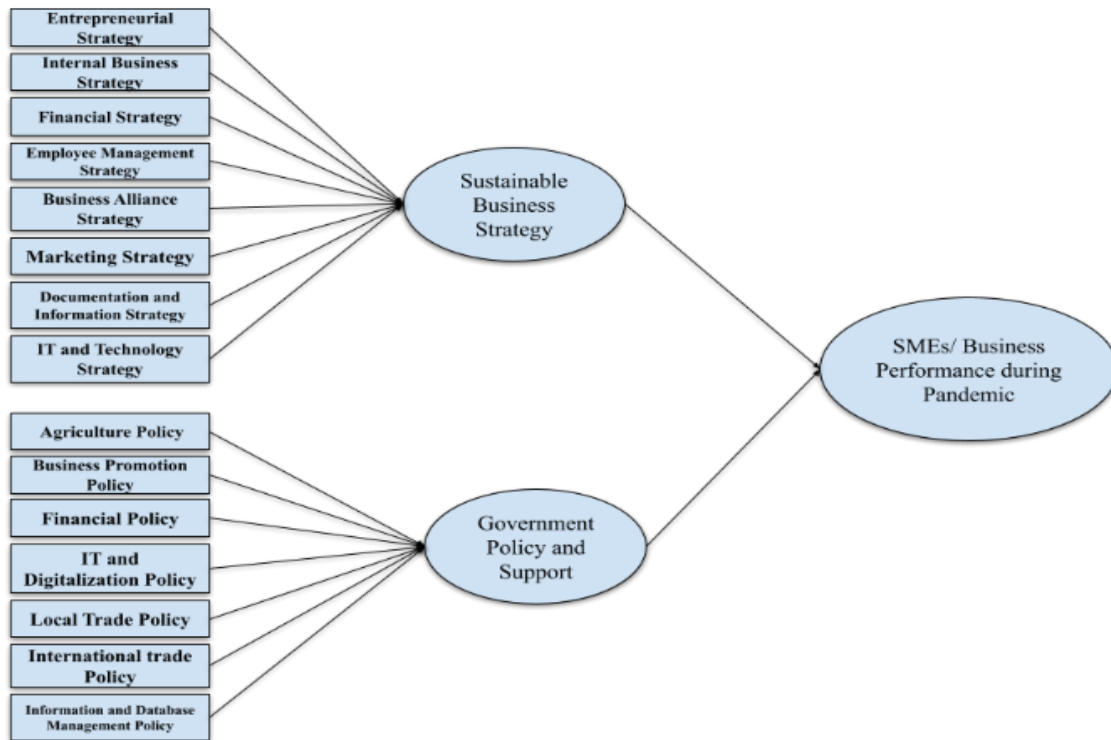


Figure 5. Proposed Model

5. Discussion

The goals of this study were to provide a robust description of the experiences of SME individuals (manager, owners, and managing director) and characterize the master themes explored in their narratives, and describe the way in which they face constraints during the pandemic. Participants described "the pandemic" from their own perspective and experience.

From the sectoral information the study found that all of eight sectors, namely automotive, electrical & electronic, food and beverage, furniture, metal fabrication, oil and gas, paper printing, and textiles suffered from the severity of the pandemic; the most effected being the electronics and electrical sector

and the least effected was the textile sector. Electronics and electrical transactions have been prevalently hampered. As the unit price of any electrical and electronics items are higher than that of other items, the less number of items sold caused less revenue. People stopped buying or postponed buying these items. As it is not an essential product, people did not rush for it. Moreover, because the raw materials of the electronics and electrical products are imported from other countries like China, Taiwan, Germany and USA, the import of raw material was large hampered during and due to the pandemic. On the other hand, the textile and cloth sector experienced the least effect of COVID-19 because people buy cloth when they need it. As it has a seasonal effect on manufacturing and selling,

the SME business could run with local arrangements and materials. The production or manufacturing function of the SMEs was prevalently interrupted. The causes of the greatest effect of COVID-19 on manufacturing activities were the lack of raw materials, less employees and workers' presence, and the threat of being infected.

In considering the opinions of the interviewees, the factors that affect SMEs' supply chain activities are depicted from two major viewpoints. The first one is the business internal strategy that an enterprise performs for sustainability (growth, profitability, customer base). The other view is from external factors, namely government policy and support. In business, an internal strategy includes its management or owners' policy, employees, own finance and funds, its marketing strategy, and data and information basis. These factors directly affect the SME functions such as manufacturing or production, and procurement. Internal policy specifies its course of action and planning from daily issues to yearly activities. Therefore, a sustainable business will depend on these factors. Further, considering internal factors, government support and favourable business and trade policies are conspicuously needed. International trade policy, government grants, tax and excise duty etc. will similarly affect SMEs' performance during and post pandemic.

6. Conclusion

Findings of the present study highlighted both the diversity and the resilience of SME entrepreneurs and managers. Their experience and observation are realistic considering the nature of the pandemic. They opined above the personal interest, rather national interest was prioritized.

6.1 Theoretical Contribution

As already stated, in the absence of research regarding the impact of the coronavirus pandemic on the supply chain and the performance of SME manufacturing firms in Malaysia, this intensive study is expected to make a significant contribution to the existing body of knowledge. The proposed model will enrich the existing theories related to the pandemic and SME sustainability especially resource based view [63] and dynamic capability theories.

6.2 Managerial Impacts

Along with the theoretical and methodological contribution, this study will also provide managerial implications. The findings of the study provided useful managerial implications for SME manufacturing firms to improve their business plans for the future (after the government lifts the Movement Control Order). The owner-managers can make use of the research findings to develop and implement plans that could help improve their business conditions. Currently various government efforts worldwide have initiated programmes to help SMEs and large business to survive during MCO. The problem and suggestions from research are useful in guiding SME manufacturing firms to survive beyond the lifting of the MCO.

6.3 Policy Impacts

The result of the study may help the government of Malaysia to set a few principles that focus on; 1) outbreak control, such as where there is a need for more stringent rules on social distancing, travel case tracing, and quarantine; and 2) jump-starting the economy by balancing the reopening of businesses and supporting SMEs with epidemic control.

6.4 Societal Impacts

Under the stakeholder approach, a firm does not only have responsibilities towards its owner/shareholders, but also its stakeholders. The stakeholders include the customers, employees, the society and the environment. From the social point of view, better performing SMEs benefit society in various ways.

6.5 Limitation and Future Direction

There are limitations to this study. As with most qualitative studies, the results of this study cannot be assumed to generalize across all other sectors of SMEs due to the sample size (only 17 SMEs from eight sectors). Online data collection may be filtered and censored. The sample could be increased to 25 and include more sectors. Future studies might be on a larger sample size using different sampling and in-person interviews. In-person interviews help the

researchers to examine the business conditions and size, employees' facilities, etc. and to get more accurate data. Different sampling techniques may provide different results. Interviews were done online and were recorded. Therefore, the respondents were very formal and answered very carefully. Furthermore, participants were exclusively from Selangor and Kuala Lumpur in Malaysia. The themes categorisation was totally the judgment of the research team.

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