Which Supply Chain Strategies Can Guarantee Higher Manufacturer's Operational Performance Applying Suitable Resources?

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Abstract— *Due to the fact that scientists and practitioners alike have interested on the leveraging manufacturing companies' operational performance, this research examined which supply chain strategies promise manufacturers higher operational performance. Later on, we clarified whether suitable resources can play an important role in the mentioned causal relationshipsas a moderator and improve the impact of the strategies on operational performance. This study is a descriptive-exploratory research in which primary data was collected from 80 Malaysian manufacturing companies. Bivariate Correlation and Multiple Regression in SPSS was applied for analyzing data. Output showed that many suppliers, few suppliers, and keiretsu network strategies enable manufacturers to achieve satisfactory level of operational performance; but, vertical integration. More importantly, suitable resources can leverage the effect of just vertical integration strategy on operational performance.*

Keywords— Supply chain strategy, Operational performance, and suitable resources.

I. INTRODUCTION

SCM consists of all activities related to the flow of goods, from raw material to end customer (Sukwadi et al., 2013). The manufacturers, suppliers, transporters, warehouses, retailers and customers are involved in a dynamic but constant flow of information, products and funds. SCM has also become known as the supply network or the supply web because they show how each unit interacts with the others (Kushwaha, 2012). The focus of SCM is integration of three broad functions namely supplier relationship management (SRM), internal supply chain management (ISCM) and customer relationship management (CRM) with a view to managing the smooth flow of product, information and funds among the supply chain partners and delivering superior value to the end customers (Chopra &Meindl, 2006).

Jafarnejad and AmoozadMahdiraji (2012) clarified supply chain strategy specifies supply chain structure which also called supplier strategy, operations strategy, or logistics strategy. It is quite obvious that there is a great overlap between supply chain and operations strategies.SinceNunes et al. (2016) revealed some helpful guidelines for green operations strategy, it should be a good idea that we also remind their definition here: we define the Green Operations Strategy as a deliberate plan, focused primarily on the long-term, which aims at responding to environmental pressures on products and production systems when creating socio-economic value.Heizer and Render (2009) revealed four type of supply chain strategies: many suppliers, few suppliers, vertical integration, and keiretsu network.

Both researchers and practitioners have focused on operational performance (OP)for several decades as one of the most important indicators of companies' achievements.Previous studies identified several OPfactors for manufacturing companies: quality, cost, speed, flexibility, and dependability (Vickery et al. 1997; Slack et al. 2004). Later on, Kumar et al. (2011) stated operations activities performed by service providers that contribute to productivity, efficiency, and consistent quality, which may be considered as operational performance measurements. They assumed quality, dependability, and speed as noticeable measures of operational performance. Consistent quality, dependability of delivery, and prompt delivery (speed) are critical operations performance factors in service delivery systems. While the literature tends to treat these three variables independently, the outcome of this research shows that like any system the elements are closely linked. (Kumar et al., 2011).

In these days' competitive environments, manufacturers try to compete with their rivals through selecting, acquiring, and using suitable resources. Kushwaha (2012) surveyed paint companies and revealed organizations should implement ERP (enterprise resource planning) software to align business objective with latest technology solutions and for optimum utilization of organization's resources and assets. Resource-based view that introduced by Barney (2001) should be defined by selecting a unique resource as an important drivers of SCA. Later on, Pacheco-de-Almeida and Zemsky (2007) mentioned companies should pay higher price if they want to obtain new and timely resources.

II. THEORETICAL BACKGROUND

2.1 Supply chain strategies

Supply chain is classified into efficient and responsive parts by Chopra and Meindl (2007). Even though responsive supply chain have to response to demand quickly, increase profit, differentiate product, lower lead time, have flexible capacity, and choose reliable, flexible, and quality supplier, the efficient supply chain offer with lower cost, increase performance, lower lead time considering cost, decrease profit, and select suppliers based on cost and quality.

One of the most important fields in SCM is supply chain strategies (SCS) that have been focused by researchers and practitioners.In order to being successful, every organization's competitive and supply chain strategies should be matched (Jafarnejad et al., 2015). A firm must identify the strategic objectives of the supply chain that are critical to contributing to meeting the firm's broader strategic objectives (Massow and Canbolat, 2014).Tyssen et al. (2011) developed a model for sustainable supply chains as shown in figure 1. They stated that there is a strong relationship between competitive and supply chain strategies for companies want to enjoy sustainability. In general we can distinguish – following markets and competition theory – three decisive factors which determine the business environment and consequently the strategy of a corporation: Demand (e.g. customers, target groups, etc.); Supply (e.g. competitors, employees, suppliers, etc.); and the General Environment (e.g. regulations, society, natural resources, etc.) (Tyssen et al., 2011).

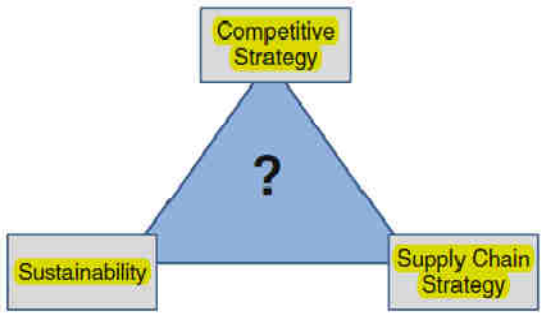

Fig.1: Source: Tyssen et al. (2011).

Supply chain strategies are designing decisions related in inventories, logistics, operations facilities, and information flow. The success of a company depends on developing innovative supply chain strategies that help the company to win, and in turns make money from information while driving continuous improvement (Kushwaha, 2012). Chopra and Meindl (2007) categorize supply chain decisions into three phases: supply chain strategy or design, planning, and operations. During supply chain strategy phase, given the marketing and pricing plans for a product, a company decides how to structure the supply chain over the next several years (Chopra and Meindl, 2007). A firm must ensure that the supply chain configuration supports its strategic objectives and increases the supply chain surplus during this phase (Chopra and Meindl, 2007).

Using aggressive, practical strategic sourcing and logistics philosophies, strategies, techniques and practices, integrated strategies takes supply chain concepts to reality and converts cost to profit (Kushwaha, 2012).By examining paint companies, he mentioned through supply chain management practices paint companies can minimize their system wide costs and also provide maximum value to their customers. In such scenario the problem is to how strategize and manage the supply chain practices so that the Indian paint companies may improve their operational performance and achieve competitive advantage in highly competitive Indian paint market?

Heizer and Render (2009) specified different type of supply chain strategies as the following:

A. Many suppliers

With the many suppliers strategy, a supplier responds to the demands and specifications of a" request for quotation," with the order usually going to the low bidder. This strategy is usually applied when a company tends to manufacture commodities. This strategy plays one supplier against another and places the burden of meeting the buyer's

demands on the supplier. Suppliers aggressively compete with each other in the bidding. Companies are not pursuing Long term partnering relationships when following many suppliers strategy. The suppliers are quite responsible for maintaining the necessary technology, expertise, and forecasting abilities, as well as cost, quality, and delivery competencies.

B. Few suppliers

A strategy of few suppliers implies that rather than looking for short-term attributes such as low cost, a buyer is better off forming a long-term relationship with a few dedicated suppliers. Long-term suppliers are more likely to understand the broad objectives of the procuring firm and the end customer. Suppliers can enjoy economies of scale and a learning curve and in turns lowering transaction and production costs by applying this strategy.Few suppliers, each with a large commitment to the buyer, may also be more willing to participate in JIT systems as well as provide design innovations and technological expertise. Many companies have tried to practice the strategy and moved aggressively to incorporate suppliers into their supply systems. Chrysler, for one, was one of the first movers and now seeks to choose suppliers even before parts are designed.

C. Vertical integration

By vertical integration, we mean developing the ability to produce goods or services previously purchased or actually buying a supplier or distributor. By this means, companies may take the form of backward or forward integration. Backward integration means that companies purchase their suppliers like Ford Motor Company that are producing its own cars radios. On the contrary, forward integration suggests that a component producer tend to manufacture finished goods or buy its distributors. Manufacturing companies enjoying capital, managerial talents, and noticeable demand can achieve cost reduction, quality adherence, and timely delivery by applying this strategy.

D. Keiretsu network

Some manufacturers have found a middle ground between purchasing from few suppliers and vertical integration. The companies are mostly financial supporter of suppliers by offering them loans. Keiretsu means a company coalition in which mentioned supplier joined. Keiretsu members can be considered as partners who committed in long term relationship with each others.

A company's supply chain now plays an important part in the aforementioned three decisive factors and therefore represents an essential strategic resource in the achievement of the strategic goals. Tyssen et al. (2011) stated that best practice companies should apply more than one SCS to customize them with regard to different customers, countries and products. Later on, Sukwadi et al., (2013) clarified enterprises would want to benefit from the advantages of the supply chain strategy. However, no previous study attempts to empirically demonstrate the relationship among supply chain strategy, supplier–firm partnerships, supply chain, and SME performance (Sukwadi et al., 2013).

2.2 Operational performance

In today's hypercompetitive environments, leveraging operational performance is one of the most concerns of both management scientists and practitioners.Since operational and supply chain performances are really interrelated, the more supply chain performance, the more leverage in operational performance. Firms are under heavy pressure to improve supply chain planning and performance because of factors such as increasing uncertainty and competition (Chae, 2014).Supply chain performance pertains to how best to meet the marketplace and spacedemands, and in turn, maximizes customer satisfaction while minimizing inventories and manufacturers' costs in which supply chain strategies, inventories, and logistics are considerable enablers.

Supply chain performance affects the ability to provide customer value, especially in the most basic dimension of the availability of products (Sukwadi et al., 2013). Kim (2009) implied Supply chain practice enables companies produce and deliver goods and services to the customers at lower cost and higher speed through leveraging supply chain performance. There is several supply chain performance evaluation methods were revealed by SCM researchers. These categories include the traditional performance evaluation method and the global performance evaluation method (Jafarian et al. 2014).

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The SCOR method should be considered as a model to evaluate current level of a company operational performance comparing with firms operating in the same

industry and benchmark firm.This is precisely the motivation behind standardization initiatives such as the supply chain operations reference (SCOR) model (Levi et al., 2000). Jafarnejad et al. (2015) recall SCOR that can be applied for assessing supply chain performance with advantages such as framework of standard processes relationship, description of standard management process fixing supply chain, standard measures for assessing processes performance, recognition of software applications which lead to the best implementations, and management methods leading to the best performance.

The performance measures should represent the members in the SCM process. There is five parts in the SCOR model: plan, source, make, deliver, and return including twenty six processes group in the second level. Applications' specifications, factors, the best implementations, and software specifications have to be focused at the third level, and lastly, supply chain processes should be evaluated.Sukwadi et al. (2013) revealed a list of metrics used to evaluate supply chain performance in the SCOR model shown in table 1.

Table 1.The Supply Chain Operations Reference Model

Perspectives	Metrics	Measure
Supply chain reliability	On time delivery	Percentage
	Order fulfillment lead time	Days
	Fill rate	Percentage
	Perfect order fulfillment	Percentage
Flexibility and responsiveness	Supply chain response time	Days
	Upside production flexibility	Day
Expenses	Supply chain management cost	Percentage
	Warranty cost as percentage revenue	Percentage
	Value added per employee	Rupiahs
Asset/utilization	Total inventory days of supply	Days
	Cash-to-cash cycle time	Days
	Net asset turns	Turns

Source: Sukwadi et al. (2013).

However, the important point is that the selection of indices and appropriate approaches for evaluation of supply chain performance must have three key characteristics: "informing, steering and controlling" (Stadtler and Kilger, 2008). It was previously more based on cost/efficiency, profit-orientation, and short-term time periods with individual indices (Jafarian et al. 2014). In spite of the fact that upon the spread of competition among industries, modern approaches have been set forth for the evaluation of the supply chain performance including: value-orientation, customer-orientation, long-term time periods, and using a set of group indices (McCormack et al., 2008).

Operations strategy capabilities are defined in terms of a company's ability to excel in specific operational performance dimensions (Narasimhan and Schoenherr, 2013).There is a causal relationship between operations strategies and operational performance (Miguel &Ledur Brito, 2011) which lead to sustainable competitive advantage (Samarrokhi et al., 2014). The results clearly show that agile and correct adjustments to achieve optimal resource allocations have directly positive impact on firm's operational performance leading to its competitive advantage, whereas non-optimal resource allocations by late or incorrect adjustments negatively affect firm's competitive advantage (Liu, & Liang, 2015).

To achieve maximum competitive advantage through the supply chain, the supply chain must be performing at its best or anything it has gained will be short-lived (Kushwaha, 2012). Singh et al. (2015) stated that companies have to select and pursue strategies associated with higher performance. It is helpful to mention here that one of the most applicable measures for operations strategies is competitive priorities which can evaluate operational performance as well.The competitive priorities framework can also be thought as way to conceptualize and measure operational performance, or even competitiveness (Miguel &Ledur Brito, 2011). Later on, Singh et al. (2015) mentioned to date, previous studies have not been able to reveal the performance differences as they relate to the various strategy models that organizations apply.

Jonsson et al. (2013) have worked on the positive effects of centralized supply chain on the operational performance in IKEA. In summary, the implementation of the new centralized supply chain concept had positive effects in terms of integration, standardization, specialization and learning effects — issues that IKEA was striving to address in the process of improving its supply chain management (Jonsson et al., 2013). The case study shows how implementing centralized supply chain planning in an appropriate planning context, achieving integration, standardization, specialization and learning, leads to operational performance improvements.

Operational performance is defined in terms of improvements made in plant productivity and a plant's time-based performance (Schoenherr and Narasimhan, 2012). Later on, Drohomeretski et al. (2014) studied the most important metrics for assessing operational performance and competitive advantage using competitive priorities. They examined several measures, speed, flexibility, reliability, quality, cost, and innovation. Thus, it was found that the order-winning competitive priorities of the companies surveyed are reliability, quality and speed (Drohomeretski et al., 2014).But,Heizer and Render (2009) revealed several measures for evaluating supply chain performance, inventory turnover, and percent invested in inventory. Since they stated most of organizations' money spends for supply chain activities, we can apply mentioned measurements to compute operational performance as well.

$$\text{Inventory turnover} = \frac{Cost\ of\ goods\ sold}{Inventory\ investment}$$

$$\text{Percent invested in Inventory} = \frac{Total\ inventory\ investment}{Total\ assets} \times 100$$

Only with effective metrics can managers determine how well a manufacturer is performing and how well the company assets are utilized; therefore it is decided to measure manufacturers' operational performance by inventory turnover, and percent invested in inventory. By this means, regarding Heizer and Render (2009), the benchmark companies for inventory turnover areToyota (13), Nissan (150), and Dell (90). It is obvious that the more inventory turn over, the higher operational performance. They also stated that percent invested in inventory should be compared with 20%, and companies stand below this amount are enjoying high operational performance like Toyota (5%).

2.3 Suitable resources

One of the most important key success factors is acquiring and using suitable resources that would be helpful for implementing supply chain strategies correctly, and achieving a satisfactory level of operational performance. According to the RBV, firms can be conceptualized as heterogeneous collections of resources and theseresource differences persist over time (Liu, & Liang, 2015). In order to understand sources of sustained CA, it is necessary to build a theoretical model that begins with the assumption that firm resources are heterogeneous and immobile (Barney, 1991). He also illustrated characteristics of suitable resources:

- Rare: competitors do not have them
- Valuable: enable a company to respond to environmental conditions
- Non-imitable: competitors cannot copy them
- Non-substitutable: other resources cannot be applied instead of them.

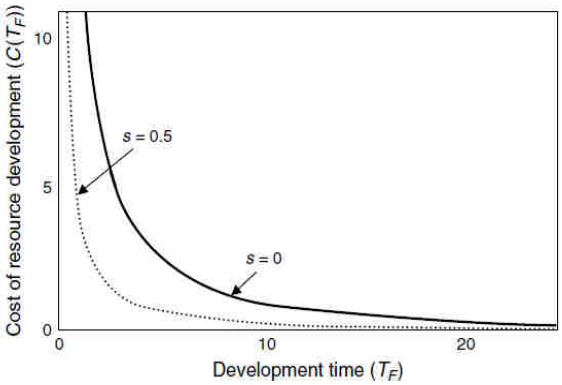
Li and Tsai (2009) mentioned core, supportive, dynamic and low-value knowledge assets as valuable resources. In between, core and supportive knowledge assets are more likely to enable companies to achieve SCAs. Lin et al. (2012) designed four process and questions regarding Barney's RBV for evaluating a company's potential SCAs applying suitable resources. Under RBV, various technological and organizational practices can be considered resources for acquiring sustained competitive advantage (Chae, 2014).

Later on, Samarrokhi et al. (2015) introduced service differentiation as one of operations strategies which can not enables manufacturers to enjoy superior financial performance and SCA; but, they can achieve them if they acquire suitable resources as strong moderator. In fact, suitable resources strengthen the effect of service differentiation strategy on leveraging companies' performance and SCA. On the contrary, Samarrokhi et al., (2015) proved that suitable resources can not be helpful for manufacturers who want to apply Lean or Six Sigma for achieving a satisfactory level of performance and SCA. It is intended to better position the company against competitors under the view of sustainable development by considering the availability of resources, its impact on the environment, and social ethics for both products and transformation processes (Nunes et al., 2016).

More importantly, time of acquiring resources can contribute manufacturing companies higher operational performance, and vice versa. We find, for example, that early in a market's development there are positives synergies to holding multiple resources that arise from

advancing the time at which the firm has positive value creation (Adner and Zemsky, 2006). For many resources, the time required for resource development is extensive (Ghemawat, as cited in Pacheco-de-Almeida and Zemsky, 2007).

Pacheco-de-Almeida and Zemsky (2007) debated that firms should trade off between acquiring suitable resources immediately and reducing costs. This trade off depends on the position of firms in the market; they want to be first mover or follower. Graph 1 was developed by Pacheco-de-Almeida and Zemsky (2007) showing that early acquiring of suitable resources require more investment.



Source: Pacheo-de-almeida, G. and Zemsky, P. (2007).

There are some theories in the field of the effects of resources on supply chain management. When it comes to coordinating a vertically focused but dispersed supply chain, several drawbacks are identified with traditional Enterprise Resource Planning (ERP) systems. Hence, stock replenishment, distribution, production and sourcing decisions can be balanced in a centralized function aiming at optimal use of resources throughout the supply chain (Stadtler and Kilger, 2008). A wide variety of SCM-related activities and practices, like supply chain management practices and environmental management practices,have been considered as important manufacturing resources for leveraging operational performance (Narasimhan and Schoenherr,2012; Blome et al.,2013).

Jonsson et al. (2013) clarified that suitable resources are one of the most significant drivers of centralized supply chain that leads to improved operational performance. The planning resources, for example, the planning staff, are allocated centrally, and therefore decisions typically are made in an "external" decision center that controls the whole supply chain and dictates supply chain plans for each partner in the network (Marcotte et al., 2009).

III. RESEARCH METHODOLOGY

3.1 Framework and hypotheses

Based on mentioned discussions, the study aims divided into two parts. Firstly, it tries to investigate which supply chain strategies have strong impacts on operational performance. Lastly, we examine whether suitable resources can play as strong moderator and leverage the mentioned effects. The research framework is shown briefly in figure 2.

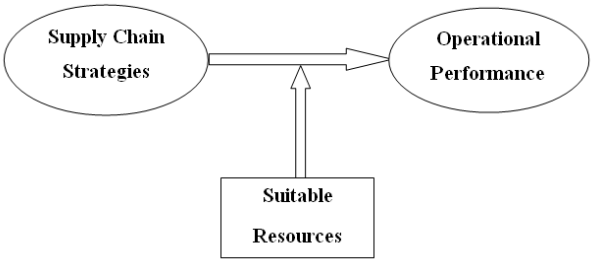


Fig.2: Research framework

Regarding the research model, following hypotheses should be considered:

H1. Many suppliers strategy is a strong driver for improving operational performance in manufacturing companies.

H2. Few suppliers strategy is a strong driver for improving operational performance in manufacturing companies.

H3. Vertical integration strategy is a strong driver for improving operational performance in manufacturing companies.

H4. Keiretsu Network strategy is a strong driver for improving operational performance in manufacturing companies.

H5. The effect of many suppliers strategy on operational performance would be stronger in manufacturing companies applying suitable resources.

H6. The effect of few suppliers strategy on operational performance would be stronger in manufacturing companies applying suitable resources.

H7. The effect of vertical integration strategy on operational performance would be stronger in manufacturing companies applying suitable resources.

H8. The effect of Keiretsu Network strategy on operational performance would be stronger in manufacturing companies applying suitable resources.

3.2 Operational procedure-measurements

The research concepts were examined by valid and reliable variable and questions. Because of the lack of previous

questionnaire in these areas, a questionnaire was introduced and applied by the authors using five-point Likert scale. For leveraging the validity of questions, it was reviewed by several scholars and practitioners, and then redesigned. Consequently, operational performance was evaluated by computing inventory turnover, and percent invested in inventory that was conducted by Chief Operating Officers of Malaysian manufacturing companies before answering the questionnaire and comparing the amount with benchmarking points as revealed in literature. Later, based on the comparisons, they ranked their companies' operational performance by Likert scale.

The COOs also were asked to what extend their companies have been pursuing mentioned supply chain strategies, few suppliers, many suppliers, vertical integration, and Keiretsu Network. More over, regarding Barney RBV, they ranked the resources acquired for manufacturing operations through questions which evaluated whether they are rare, valuable, non-imitable, and non-substitutable.In addition, this research was examined if the resources are timely or not for the first time.

3.3 Research design

The current study is a cross-sectional descriptive-exploratory research, in which previous studies were applied to extract secondary data. Later on, primary data were collected through a structured questionnaire, partly designed by authors, from Malaysian manufacturing companies. Later on, some questions were revised regarding several researchers and practitioners ideas as pilot study.

Regarding Hair et al. (2010), 15 samples should be surveyed per every independent variable. Consequently, due to the existence of four independent variables, at least 60 manufacturing companies have to be evaluated; but, authors analyzed 80 enterprises for improving the study reliability and validity. So, 80 Malaysian manufacturers, with at least 500 employees and operating history of more than 5 years, were considered for collecting primary data. The respondents, COOs, were roughly over 40 years old and had more than 10 years worth of work experiences. SPSS-20 (Bivariate Correlation and Multiple Regression) were applied for analyzing data.

3.4 Reliability and validity

Reliability of concepts and variables was calculated applying Cronbach's alpha, all fell between 0.7 and 0.9 (many suppliers: 0.867, few suppliers: 0.888, vertical integration: 0.838, Keiretsu network: 0.704, and suitable resources: 0.900), indicating our concepts and variables enjoy pleasant reliability. Regarding Corbin and Strauss (2008),five scholars and four COOs revised and validated the concepts and variables in terms of the face method.

More importantly, exploratory factor analysis (EFA) (Habing, 2003) was applied as the most important method for validity test. The Eigen values settled greater than 1 and KMOs sit ideal range (0.6–0.9) (many suppliers: 0.823, few suppliers: 0.840, vertical integration:0.718, Keiretsu Network: 0.659, and suitable resources:0.871).

IV. ANALYSIS AND DISCUSSION

Logically, supply chain strategies can be considered as one of the most significant drivers of operational performance; how ever, this study enlightened which SCSs promise manufacturing companies appropriate operational performance.More importantly, it should be clarified that if suitable resources can leverage the effects of each SCSs on operational performance. In deed, we test the moderating role of suitable resources. Therefore, first of all, descriptive statistics and Bivariate Correlation (Pearson coefficient) were used (Table 2 & 3)and output showed considerable relationship between all supply chain strategies and operational performance; but vertical integration. In deed, manufacturers would not achieve a satisfactory level of operational performance by applying vertical integration strategy based on correlation analysis.

Secondly, the effects of supply chain strategies on operational performance were measured without considering the role of moderator through Multiple Regression. Based on outputs, because of the amount of R-square (0.956), the 95 Percent of operational performance (dependent variable) was modeled by supply chain strategies (independent variables) wit significance of 0.000.

Table 2.Descriptive Statistics

	Many Suppliers	Few Suppliers	Vertical Integration	Keiretsu Network	Resources	O.P.
Mean	**2.7219**	**2.6594**	**3.7167**	**2.7333**	**2.6500**	**2.7125**
S.D.	**1.095**	**1.111**	**1.277**	**1.115**	**1.114**	**1.274**

Table 3. Correlation Matrix

	1	2	3	4	5	6
1. Many Suppliers	**1**					
2. Few Suppliers	**0.857**	**1**				
3. Vertical Integration	**-0.699**	**-0.601**	**1**			
4. Keiretsu Network	**0.887**	**0.861**	**-0.664**	**1**		
5. Suitable Resource	**0.877**	**0.836**	**-0.661**	**0.893**	**1**	
6. Operational Performance	**0.928**	**0.933**	**-0.670**	**0. 939**	**0.921**	**1**

Regarding Model Summary and ANOVA tables, P-value of many suppliers, few suppliers, and Keiretsu network strategies sit less than 0.05. In contrast, the P-value for vertical integration became 0.790 illustrating that the strategy has no serious effect on operational performance. More over, regarding outputs, Regression coefficients for many suppliers, few suppliers and Keiretsu Network (0.318, 0.435, and 0.416), and constant amount (-0.414) enabled us to reveal the Regression equation as the following:

Operational performance = -0.414 + 0.318 (many suppliers) + 0.435 (few suppliers) + 0.416 (Keiretsu network)

Consequently, hypotheses one, two, and four were supported; but hypothesis three was rejected. Now, the role of suitable resources as moderator for the impacts of SCSs on OP should be analyzed. By this mean, we compare two R^2, the first one is without considering the moderator role; and later, moderator variable was inserted. Then, if the second R^2 has positive considerable difference with the second one, the effect of moderator will be noticeable. The SPSS Multiple Regression output is shown in table 4.

Table 4. multiple regression analysis

Many Suppliers	**Without Moderator**	**With Moderator**
R-Square	0.911	0.913
Sig.	0.000	0.000
Δ(R-Square)		0.002
Few Suppliers	**Without Moderator**	**With Moderator**
R-Square	0.936	0.939
Sig.	0.000	0.000
Δ(R-Square)		0.003
Vertical Integration	**Without Moderator**	**With Moderator**
R-Square	0.855	0.867
Sig.	0.000	0.000
Δ(R-Square)		0.012
Keiretsu Network	**Without Moderator**	**With Moderator**
R-Square	0.916	0.916
Sig.	0.000	0.000
Δ(R-Square)		0.000

Based on Multiple Regression outputs, the following results can be released:

Many suppliers and suitable resources: Due to the fact that computed Δ(R-Square) is quite small (0.002), we can conclude that suitable resources can not leverage the effects of many suppliers on operational performance. Therefore suitable resources can not be considered as a strong moderator for the causal relationship. It may because of the strength of many suppliers individually. So, the hypothesis five was rejected.

Few suppliers and suitable resources: Because of the small amount of Δ(R-Square) (0.003), the impact of suitable resources on the relationship of many suppliers and operational performance is meager. Then, the moderator effect of suitable resources can be ignored. Consequently, the hypothesis six is rejected.

Vertical integration and suitable resources: Contrary to the previous supply chain strategies, suitable resources can be considered as a strong moderator of the effect of vertical integration on operational performance; because when we inserted moderator in the mentioned relationship, the R-Square was shoot up by 0.012 which is quite noticeable. Even though vertical integration is so weak to enable manufacturers enjoy high operational performance, suitable resources can leverage the effect considerably. In deed, manufacturers who apply vertical integration strategy and acquire suitable resources simultaneously can achieve a satisfactory level of operational performance. So, hypothesis seven is supported.

Keiretsu network and suitable resources: Like many and few suppliers, suitable resources have no serious effect on leveraging the impact of keiretsu network strategy on operational performance due to the amount of Δ(R-Square) (0.000). In fact, manufacturers can not rely on the moderating effects of suitable resources to improve the impact of keiretsu network on operational performance. Consequently, hypothesis eight is rejected.

V. CONCLUSION

In today's hypercompetitive environments, manufacturers would not survive without leveraging operational performance and due to the fact that supply chain strategies have been playing an important role for this achievement; and no research has been found considering these matters, 80 Malaysian manufacturing companies have been focused to reveal helpful model and formula enabling managers to enjoy noticeable operational performance. Regarding outputs, improving manufacturers' operational performance can be guaranteed if they pursue many suppliers, few suppliers, and Keiretsu network strategies. Mentioned SCSs have efficient impact on manufacturing companies' operational performance.

On the contrary, vertical integration strategy would not promise any satisfactory level of OP. More importantly, suitable resources could not improve the effects of many suppliers, few suppliers, and Keiretsu network strategies on operational performance as an effective moderator. In contrast, suitable resources could soot up the impact of vertical integration on operational performance noticeably.

We have faced some difficulties of collecting primary data. Although 110 COOs have been asked to cooperate, only 80 of them have responded to our questionnaire. More over,since we have surveyed manufacturing companies, other management researchers can examine service provider companies for future studies to figure out whether service sectors have been following manufacturing companies behavior or not. Even though Malaysia is one of the considerable developing countries especially in Asia, analyzing other developing countries might be helpful.

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