Investigating the Moderating Role of Competitive Strategies on the Impact of Supply Chain Integration on the Financial and Operational Performance (Case Study: The car manufacturing industry in IRAN)

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Abstract
The increase of international competition motivated most of the organizations to create useful shared mutual cooperation with supply chain partners since they understood that cooperation and collaboration of supply chain partners is the prerequisite for the increase of reliability level and the decrease of risks and also the enhancement of innovative qualities and profitability of the companies in recent competitive and dynamic market. Integration of supply chain is an important strategy in creating cooperation and collaboration among different elements of supply chain, and plays a vital role in the enhancement of performance of the companies in supply chain. The objective of the present study is to investigate the effect of supply chain integration on the performance of car part manufacturing companies. Current study follows a descriptive, analytical approach in which the correlation between the variables of sample under study is investigated. This sample includes 81 company which produce car parts with a grade A of SAPCO Company. Samples were selected through census in the initial phase. However in the second phase sampling was done through improbable and judgmental sampling. In order to testify hypothesis PLS method was used. The result of this study indicates that there is a direct effect between supply chain integration and improvement of operational performance of companies under investigation.

Keywords:
External Financing
Real Investment Theory
Pricing Model

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INTRODUCTION

During the last two decades, the companies focused on a cooperative strategy to ease the activities in the processes inside and outside in order to be responsive to the quick change of market needs and customer’s demands, the decrease of operational costs and the increase of financial performance of the company and also assurance of the availability of their products (Kumara et al., 2017). Intensification of global competition and the demand for better services for the customers in recent years augmented the attention of the researchers to different methods of integration among the supply chain partners significantly. That is because creating and maintaining the competitive advantage is a vital element for companies and its basis is the cooperation of the processes in supply chain (Danese et al, 2013). For the companies are constantly facing environmental chaos that is the result of convergence between dynamicity, uncertainty and complexity (Diaz & Garrios, 2017). It seems that for surviving in such an environment, the companies are obliged to develop their supply chain through reciprocal integration with supply chain partners (Feng et al, 2017). Since the nature of amalgamation is in a way that it creates competitive advantages through increasing the costs or creating added value for the customers with optimizing the main trade processes that leads to a better organizational performance (Chang et al, 2016). Because when the members of a supply chain are integrated and there is a good relationship, they are able to respond quickly to long term or short term changes of the market easily (Kumara et al., 2017). This can be justified like an integrated supply chain in general benefits from the direct flow of material with the decrease of storage, the increase of prediction accuracy, gaining a better product and a better management of inventory (A Hill et al., 2018). The increase of global acceptance and the short cycle of product’s lifetime are two major factors that encourage the organizations to concentrate on reciprocal relationship and profitable cooperation instead of pure competition (Tarifa- Fernandez & De Burgos-Jimenez 2017). The reason of this change in approach is that the formation and effective management of long term cooperation between the supply chain partner leads to the improvement of supply chain amalgamation level and the remarkable improvement of companies’ performance (Fawzi et al., 2017). Indeed, having an integrated net of customers and suppliers increase the competitive power of the companies (Gu et al., 2017). That is because it expedites the exchange of information and an effective reaction to probable failures and results in sharing the constructive experiences of the companies among the supply chain partners after overcoming the failure (Liu et al., 2017). The integration of supply chain includes cooperation and strategic integration of processes inside and outside companies and it is a tool for achieving reciprocal profit and advantage (Seo et al., 2014). Based on the related literature, we classify the supply chain integration to inner and outer integration. Inner integration refers to the level that a company can control organizational method structures, its methods and behaviors through shared processes to fulfill the customer’s need (Zhao et al., 2011). Based on this, the used indicator in this plan for measuring the inner integration level includes: the integration of practical information among the inner parts of the company, the use of a common and comprehensive software program for the internal parts of the company, the integration of inventory management, sharing the information about the crude material from production to selling using the periodic intergroup meetings in internal parts of a company and forming the expert teams from all the related units for production design. The outer integration means the manufacturers cooperate with foreign partners (suppliers and customers) in strategies, production ways and production processes (Mao et al., 2017). We know that creating the added value for big companies require a set of activities for manufacturing or services that is understood by the customers for meeting their needs. Day by day growth of these activities results in the enhancement of competitive position of the companies (Beheshti et al., 2015). The growing levels of competition all over the world motivated the companies to look for the formulation and implementation of cooperative strategies such as integration. These companies found out that creating the integration strategy in a business relationship,
is a suitable model to achieve to success and competitive advantage and most of the problems that manufacturers are dealing with such as the shortage of car parts, the issues related to product’s delivery and problems about quality and the increase of the costs are all due to the lack of effective integration in supply chain (Huang et al., 2014). This cooperation and coherence as one of the managerial tools may enable the company to gain access to the resources of the other partners and in this way the collective performance is enhanced. The common belief is that integration of a win-win method that guarantee the best possible ways for increasing the profitability and decreasing the costs of production, storage and etc. for all the members of the chain (Kumara et al., 2017) because the cooperation among companies leads to the creation a new setting in processes, productions and service in order to meet the special needs of the partners (Nyaga 2013). The results of numerous studies emphasized that integration is a valuable strategy because it facilitates the process of information exchange and efficient circulation of products/services and enables the companies to meet the changing needs of the members in the supply chain. Moreover, integration includes complex resources and in-conspicuous processes in a way that it may be expensive for the rival companies to imitate it quickly (Change et al., 2016).

Since the results of the previous studies clarified that different aspects of supply chain integration can perform as an important predictor of the company’s premier function (Liu et al., 2013). We decided to study the effects of supply chain integration on the performance of car parts manufacturing companies (Financial and operational) considering the moderating role of competitive strategies (differentiation and cost leadership) in Iran through the model suggested by Hu et al.(2014) since the integration of supply chain can improve the profitability through increasing the income and decreasing the costs and also special operational advantages including faster development of the new product, the minimum time of doing the order and … (Jin et al., 2013).

Regarding the presented content, the main question of this research is posed as follows:

1. Is the supply chain integration effective on the companies’ performance?
2. Can the competitive strategies moderate the relationship between supply chain integration and the performance of the companies?

The theoretical framework of the study

Company’s performance is a multi-dimensional concept that evaluates the condition of the company compared to the rivals (Hu, 2012). Performance of a company is a very important variable to decide on the strategies of a company (Tarus and Aime, 2014). And making improper financial and operational decisions may increase the internal costs of the company and result in risky and unstable conditions and if these conditions cannot be handled appropriately, they may lead to the bankruptcy or dissolution of the company (Pineda et al., 2017). The performance of company is an extended concept that contains different aspects of operation, management and competitive excellence and its activities (Tseng & Liao 2015). In other words, the performance of company is the level of its success in creating values for different parts of the market and the success of each company’s strategies is reflected in its performance (Feiz et al, 2010). Financial performance is the improvement of financial aims based on the income minus cost-based indicators such as profitability, the return of investment and the return of sales (Chang et al., 2016). In other words, financial performance is used for measuring the potential financial growth of the companies (Mao et al, 2017). In this study, the financial performance is measured by six items: the return of the investment (ROI), the return of the sales (ROS), market portion, the growth in ROI, the growth in ROS and the growth in market portion. Based on the definitions, operational performance is known as a complex multi-dimensional hierarchical structure that includes the development of organizational actions related to supply chain such as the decrease of preparation costs, the decrease of delivery time and inventory turnover (Chang et al., 2016). Base on this, evaluation indicators of operational performance in this study includes: the general quality of the product, the level of customer services, pre-sale of services to customers, product support, re-
response to customers, delivery speed, trust in delivery, flexibility capacity, product amalgamation flexibility, and the flexibility of new product.

The results of the research done by Gu et al. (2017) proved this fact that the operational performance of the company has a direct and positive effect on its financial performance. So, we can claim that company’s operational processes are the key to change the operational advantages to financial advantages. Using integrated inner and outer strategies simultaneously improve the financial performance of the company because this issue has a synergic effect on the company (Gu et al., 2017). Because the integration of supply chain is for achieving group purposes, having a common perspective can improve the performance of the company (Yu & Choi, 2014). Change in company’s strategies leads to a change in its organizational structure. Based on this item, if the strategy develops accurately, a better performance is possible for the company (Pertusa et al., 2010).

In this study, the competitive strategies of cost leadership and differentiation are studied as moderating variables. These competitive strategies are capable of being the main variables in different studies from the aspect of output and importance (Pehrsson, 2017). Competitive strategy means the search for getting a suitable competitive condition in industry. This is about the objective arenas in which the competitions occur and the purpose is to create a profitable and stable condition against the powers which are determining in industrial competition. In other words, a competitive strategy is an infrastructure to create competitive advantage which is the competitive nature itself and the major determining factor in performance (Teti et al., 2014). It is interesting that the framework of Porter’s general strategies is still practical in digital competition age (Banker et al., 2014). There are a lot of cases that companies without the competitive power tried to form a strategic union with the rivals that risk their competitive balance. Porter (1986) define the competitive strategies as a way to develop defensive and aggressive measures in market in order to maintain the qualities of five competitive power so in this way the success of plan and the return of investment can be guaranteed (Santos et al., 2017). The competitive strategies respond to the howness of the creation of competitive advantage for trade units in a competitive environment (Salavou, 2015).

In Porter’s idea cost’s leadership and differentiation are the main general strategies that are chosen for creating competitive advantage, he also emphasizes that in every specific time organizations must choose one of these strategies and the organizations that follow more than one general strategy at the same time, may always stay at the average level (Kaliappen & Hilman, 2017). In Porter’s idea, a company should have a clear choice between differentiation and cost leadership strategies in order to get a better profit more than its rivals and to avoid the innate contradiction of different strategies (Acquaah & Ardekani, 2008). Although, he claims that an outdoor environment has a significant effect on strategic developments of competition (Mathooko & Ogutu, 2015). With these all, Porter believes that theories related to cost leadership and differentiation are incompatible, those who believe in the mixture of strategies think that a business is successful when it can gain profit from the mixture of two conditions at the same time to overcome every challenge (Parnell., 2011).

Cost leadership strategy is a set of integrated actions for manufacturing and selling the product or service with unique features to customers with the minimum cost compared to the rivals or in minimizing the costs in order to reach a high profitability (Teeratansirikool et al., 2013) and the differentiation strategy is defined as a set of integrated actions done for manufacturing the product or services- with acceptable cost and different ways for the customers who care for having a different product (Herzallah et al., 2017). According to the findings, different competitive strategies have effect on the performance of the company in various ways. Based on Porter’s idea, a business can achieve a competitive advantage that results in maximizing performance (Jusoh & Parnell, 2008).

The theoretical model of this research is derived from Hu et al. (2014) (Figure 1), in which external integration is divided into two types: process integration and product integration. Product integrity refers to the involvement of
suppliers and customers in the development of new products and aims to support this development through close engagement with supply chain partners. Process integration, deployment of collaborative processes in coordination with suppliers and customers, and its goal is to support product production and delivery (Hu et al., 2014).

The research hypothesis:

According to the proposed model by Hu et al. (2014) that is studied in this research, the hypotheses are:

H1: Integration of supply chain has effect on operational performance of car parts supplier companies.

H1a: Internal integration has effect on operational performance of car parts supplier companies.

H1b: Process integration has effect on operational performance of car parts supplier companies.

H1c: Product integration has effect on operational performance of car parts supplier companies.

H2: Supply chain integration has an effect on financial performance of car parts supplier companies.

H2a: Internal integration has an effect on the financial performance of car parts supplier companies.

H2c: Product integration has an effect on financial performance of car parts supplier companies.

H3: The competitive strategies moderate the effect of supply chain integration on operational performance of car parts supplier companies.

H4: The competitive strategies moderate the effect of supply chain integration on financial performance of car parts supplier companies.

THE METHODOLOGY

Based on data collection, this study is a descriptive-analytic research and based on the purpose, this study is an applied research. The statistical population of this study are 81 automotive parts manufacturers with Grid A. Regarding is the level of analysis in this research is organization, for to collect the data with a field method was used Hu-et al. (2014) questionnaire and based on the census.

RESEARCH FINDINGS

According to the results of the "t" test obtained in Table 1, the average of the variables of the research is expected. Also, the numbers in the Table indicate that the highest mean is for the financial performance variable and the lowest mean is for the product integrity variable. We can study research theories based on the relationship
between variables in the proposed model.

**Model processing**

According to Table 2, the statistical subscription that shows the fitness of the model is more than 0/5 and the value of R2 which indicates the ability of the model to describe the structure, for dependent variables indicates that the proposed model has an acceptable ability to describe the final dependent variables.

Examine the goodness of fit in the general model

The result of the general fitting of the model calculated by the following equation is shown in Table 3:

\[
GOF = \sqrt{\text{com} \times R_{inner}^2}
\]

Table 1: "t" test results of test variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Numbers</th>
<th>Mean</th>
<th>t statistics</th>
<th>Standard Deviation</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal integration</td>
<td>81</td>
<td>3.4383</td>
<td>5.816</td>
<td>0.67828</td>
<td>0.000</td>
</tr>
<tr>
<td>Process integration</td>
<td>81</td>
<td>3.2494</td>
<td>3.587</td>
<td>0.62572</td>
<td>0.001</td>
</tr>
<tr>
<td>Product integration</td>
<td>81</td>
<td>3.1914</td>
<td>2.922</td>
<td>0.58932</td>
<td>0.005</td>
</tr>
<tr>
<td>Operational performance</td>
<td>81</td>
<td>3.4561</td>
<td>7.205</td>
<td>0.56973</td>
<td>0.000</td>
</tr>
<tr>
<td>Financial performance</td>
<td>81</td>
<td>3.6757</td>
<td>9.745</td>
<td>0.62404</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 2: Results of the model processing process

<table>
<thead>
<tr>
<th>Variable</th>
<th>The fitness of the assay model</th>
<th>Structural model fitness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average subscription</td>
<td>R²</td>
</tr>
<tr>
<td>Internal integration</td>
<td>0.57</td>
<td>—</td>
</tr>
<tr>
<td>Process integration</td>
<td>0.50</td>
<td>—</td>
</tr>
<tr>
<td>Product integration</td>
<td>0.69</td>
<td>—</td>
</tr>
<tr>
<td>Operational performance</td>
<td>0.60</td>
<td>0.55</td>
</tr>
<tr>
<td>Financial performance</td>
<td>0.73</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Table 3: General model processing

<table>
<thead>
<tr>
<th>Average Of Shared Values</th>
<th>Average Determination Coefficient</th>
<th>General Model Processing(GOF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.61</td>
<td>0.46</td>
<td>0.529</td>
</tr>
</tbody>
</table>

The value of 0.529 means a strong fit of the model.

**Study of the research model in two standard and significant modes**

Based on the results of analysis in the standard state, it can be said that the dimensions of the supply chain integration account are for about 55% of operating performance and 38/3% of financial performance. We know that, the structural mode of the research in the significant numbers of states, the meaningful relationship between the variables of the research can be found. However, there will be some significant ones that are out of range, which mean that if the T test is a number between 1/96 and -1.96, it will be meaningless.
Checking the moderator effect

In hypotheses 3 and 4, we examine the effect of the type of the converter strategy. For this hypothesis, companies are divided into two strategies based on the strategies of cost and differentiation leadership, and they examine the relationship between two-variable relationship and supply chain integration with performance.

Table 4: Linear Regression between supply chain integrity and operational performance

<table>
<thead>
<tr>
<th>Type of strategy</th>
<th>R</th>
<th>R²</th>
<th>Regression model coefficient</th>
<th>Significant performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost management</td>
<td>0.833</td>
<td>0.694</td>
<td>0.967</td>
<td>0.000</td>
</tr>
<tr>
<td>Distinction</td>
<td>0.681</td>
<td>0.463</td>
<td>0.823</td>
<td>0.000</td>
</tr>
</tbody>
</table>

According to the above table, two linear equations are obtained:

Y = 0.967X + 0.238  \hspace{1cm} \text{Equation 1 (Cost management strategy)}

Y = 0.823X + 0.674  \hspace{1cm} \text{Equation 2 (Distinction strategy)}

It is observed that the gradient in the strategy of differentiation strategy is more than cost leadership. Meanwhile, by using the following formula, we can examine whether the difference in the slope of the line is significant or not.

\[
t = \frac{R_1 - R_2}{\sqrt{\left(\frac{1}{n_1 + n_2 - 2} \times S_1\right) + \left(\frac{1}{n_1 + n_2 - 2} \times S_2\right)}} \times \frac{1}{\sqrt{n_1 + 1}} + \frac{1}{n_2}
\]

We insert R1, R2, S1 and S2 from software outputs in the above formula and obtain the following results:

\[
t = \frac{(0.152)}{(0.712)}
\]

\[
t = 0.213
\]

Although the impact of supply chain integration on operating performance is greater in the strategy of differentiation, the "t" value is less than 1/96. This effect is not meaningful.
According to the above table, two linear equations are obtained.

\[ Y = 0.632X + 1.594 \]  
Equation 1 (Cost Management Strategy)

\[ Y = 0.749X + 0.827 \]  
Equation 2 (Distinction Strategy)

It is observed that, the gradient in the strategy of differentiation strategy is more than cost leadership. Also, by using the following formula, it is examined whether the difference in the slope of the line is significant or not.

\[
t = \frac{R_1 - R_2}{\sqrt{\frac{(n_1-1)\times S_1^2}{n_1+n_2-2} + \frac{(n_2-1)\times S_2^2}{n_1+n_2-2} }} \times \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}
\]

\[(3)\]

We insert \(R_1, R_2, S_1\) and \(S_2\) of the outputs of the software in the above formula and get the following results:

\[ t = \frac{(0.235)}{(0.814)} \]
\[ t = 0.288 \]

It is shown that, however the extent of the impact of supply chain integration on financial performance is greater in the strategy of differentiation but the amount of achieved \((T)\) is less than \(1/96\) and this effect is not meaningful.

The results of the analysis of the data collected on the confirmation of the research theories are presented in the following table:

### Table 5: Linear Regression between supply chain integrity and financial performance

<table>
<thead>
<tr>
<th>Type of strategy</th>
<th>(R)</th>
<th>(R^2)</th>
<th>Regression model coefficient</th>
<th>Significant performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost management</td>
<td>0.514</td>
<td>0.264</td>
<td>0.632</td>
<td>0.000</td>
</tr>
<tr>
<td>Distinction</td>
<td>0.749</td>
<td>0.561</td>
<td>0.790</td>
<td>0.000</td>
</tr>
</tbody>
</table>

### Table 6: Study Hypotheses

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Relationship rate</th>
<th>“t” Statistics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal integration effects on operational performance</td>
<td>0.264</td>
<td>3.58</td>
<td>Confirm</td>
</tr>
<tr>
<td>Process integration effects on operational performance</td>
<td>0.241</td>
<td>2.91</td>
<td>Confirm</td>
</tr>
<tr>
<td>Product integration effects on operational performance</td>
<td>0.335</td>
<td>4.53</td>
<td>Confirm</td>
</tr>
<tr>
<td>Internal integration effects on financial performance</td>
<td>0.278</td>
<td>3.47</td>
<td>Confirm</td>
</tr>
<tr>
<td>Process integration effects on financial performance</td>
<td>0.143</td>
<td>1.54</td>
<td>Reject</td>
</tr>
<tr>
<td>Product integration effects on financial performance</td>
<td>0.032</td>
<td>0.65</td>
<td>Reject</td>
</tr>
<tr>
<td>Competitive strategies moderate the impact of supply chain integration on operational performance</td>
<td>0.000</td>
<td>0.213</td>
<td>Reject</td>
</tr>
<tr>
<td>Competitive strategies moderate the impact of supply chain integration on financial performance</td>
<td>0.000</td>
<td>0.288</td>
<td>Reject</td>
</tr>
</tbody>
</table>

**CONCLUSION**

Based on the results of data analysis, product integrity, internal integrity, and process integrity have the highest impact on corporate performance. But in terms of financial performance, internal integrity can influence corporate financial performance, but the integrity of the process and the integrity of the product do not affect the financial performance of the company.

Santa et al. (2011) and Wang et al. (2011), in their research, concluded that internal integrity had a positive impact on operation performance. According to Hu (2012), although some authors have found no direct relationship between inter-
nal integration and operational performance, but other authors have a positive and significant relationship between internal integrity (for example, cost integrity, quality, delivery, innovation, flexibility, process productivity, Time-based function and logistics service functionality) confirm the operation performance. Considering the results of Li Jao group in 2013 proved that different kinds of supply chain integration play different roles in development of operational performance of the company. Based on their idea there is a conditional connection between supply chain integration and performance. From their perspective, integration with supplier, internal integration and customer integration are important indicators for gaining production plan, competitive performance and customer’s satisfaction. The results of Hu’s group in 2014 showed a positive connection between different aspects of supply chain integration and operational performance of the company.

About the second hypothesis and the related sub-hypothesis it can be said that most of the studies so far confirmed the positive relation between supply chain integration and financial performance of the organizations. West Bruke proved that companies with high level of integration with customers and suppliers gained the best and highest financial performance level from market portion and profitability. Drug (2004) showed that both types of integration, internal and external, are related to financial performance through time based performance. Zilani and Rajagupal proved that producers with the highest external integration with customers and suppliers gained the highest financial performance. The findings of different researchers indicate that the integration of internal and external processes and product integration lead to the development of producer’s financial performance. Beheshti et al (2014) represented that supply chain integration in any level is profitable for the financial welfare of the company and companies that their supply chain is totally integrated, have the highest financial performance level. Regarding all these results, Hu et al (2014) indicated that the connection between internal integration and product integration with financial performance is positive and significant but they could not find any significant connection between process integration and the financial performance of the company.

In the third and fourth hypotheses, the significant effect of competitive strategies on the relationship between supply chain integration (with three dimensions) and the performance of car manufacturers (two dimensions) was measured and not confirmed; which is consistent with the results of Hu et al. research in 2014.

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