

# The Role of Supplier Capabilities in Buyer Responsiveness

Habibollah Javanmard

**Abstract**— the present research aims at exploring the role of supplier capabilities and their collaboration in buyer responsiveness. The research sample includes production workshops located in Lourestan and Hamedan Provinces in Iran which have been studied during a four month period. In order to relate supply flexibility and responsiveness and also to model the effect of supplier collaboration on buyer responsiveness, four hypotheses have been developed and examined correspondingly. The Structural Equation Modeling (SEM) and the path analysis are used in testing the research hypotheses applying LISREL software, version 8.5. The results reveal that production flexibility, supplier responsiveness, production modularity and supplier collaboration have a positive and meaningful impact on the buyer responsiveness.

**Index Terms**—buyer responsiveness, competitive, advantage, supplier collaboration.

## I. INTRODUCTION

Development of global competition coupled with consumer intolerance to slow innovation and homogenized products have raised the profile of manufacturing responsiveness. In this broad sense, responsiveness refers to the speed with which action is taken in response to changing customer needs in an effective and profitable manner [1]. Whereas academic research has traditionally focused on the critical internal attributes and capabilities that affect an organization's level of responsiveness [2,3,4], recent studies have extended the scope to include aspects of the supply chain [5]. This development implicitly hangs on the notion that internal capabilities are a necessary but not sufficient condition for responsiveness and that external supply networks will also have a significant effect [6].

This perspective clearly resonates with recent theorizing within the resource-based view (RBV) of the firm. Whereas the traditional view holds that competitive advantage is exclusively a function of internal capabilities [7], more recent studies hold that both internal and external capabilities are important to performance [8,9]. This change in emphasis has led to the term "extended resource-based view" (ERBV) and is explicitly used within this paper to emphasize the need to consider the impact of suppliers' capabilities on buyer firm performance. We suggest that three supplier manufacturing capabilities, namely responsiveness, flexibility and modularity, have a direct effect on buyer firm performance as measured by levels of customer responsiveness.

In such a relation, both parties (supplier and buyer) share their information and so the buyer is able to transmit customer's required changes to the supplier or the buyer through this collaboration learns about the supplier capabilities. Such relationship, however, makes the buyer company more responsive to its customers. But in the absent of such a relation, the buyer is not able to meet customers required changes and thus lacks its needed responsiveness. Supplier flexibility is defined along two dimensions: Volume flexibility and Mix flexibility. Previous studies have shown that responsiveness to the customer is an important determinant of competitive advantage [10] and is influenced by supplier relationships [11].

Regarding the products high demand and wide supply range, it is essential for such units to look for better responsiveness because the company's or organization's success strongly depends on the customer satisfaction. The units are as a part of one or more supply chain(s), so it is required to examine other effective factors on these workshops' responsiveness. Therefore, it is imperative to examine whether the supplier production capabilities and their collaboration have any impact on these production units (buyers) responsiveness.

## II. LITERATURE REVIEW

### A. Supply Chain and Resource-Based View (RBV)

Traditionally, organizations obtain products and services through markets or hierarchies. The choice between them is often referred to as the "make or buy" decision. A large body of literature has sought to define when a firm should make or buy. For example, making a product (through hierarchy) enhances predictability, but may require significant investment and reduce flexibility. Buying (through markets) maintains flexibility and minimizes investment, but reduces predictability.

The prospect that SCM can make firms more customers responsive and thus more profitable has led managers to spend vast sums to improve supply chain processes. For example, UPS has spent \$9 billion since 1986 [12].

The RBV is perhaps strategic management's dominant perspective currently. This view focuses attention on a firm's assets. The most important assets are "strategic" resources that are rare, valuable, and difficult to purchase or imitate. These resources provide competitive advantages over rivals lacking such resources. Patents, strong reputations, and positive organizational cultures, for example, may serve as strategic resources for some organizations. In contrast, nonstrategic assets (e.g., cash) are possessed by many organizations and thus do not distinguish an organization's

ability to be competitive [12].

SCM studies often focus on the flow of materials. Considering the RBV, however, encourages a deeper look at chains. Specifically, are certain supply chain practices or characteristics rare, valuable, and difficult to duplicate? If so, these unique elements may provide some chains with a competitive edge. One study has addressed this issue. Hult, Ketchen, and Nichols found that supply chain 'cultural competitiveness' (i.e., the degree to which chain members are dedicated to closing gaps between what customers are getting and what customers want) is related to order fulfillment cycle time [13]. Because culture is intangible, these authors assessed cultural competitiveness indirectly using the latent variable capability of structural equation modeling. The cultural competitiveness–cycle time linkage provides some evidence for the RBV's value in the supply chain context. Thus, although inquiry into chains' less tangible aspects has been scant, we believe such inquiry offers great promise [14].

#### *B. Buyer–supplier behavior and Competitive advantage*

The competitive advantage has changed to a focal point in competitive strategy discussions during the recent years and plenty of arguments have been developed about the topic. Despite of this, it is very difficult to present an exact definition for the competitive advantage. In one hand, some researchers have termed it as an unusual output; and in other hand, some have related it to expectations and capital market performance. However, the most popular definition is presented in the competitive strategy realm and value-adding framework: the competitive advantage causes the income to increase more than expenditures [15].

Sanoner, Shephard and Poudoneli [16] remark that the competitive advantage means the firm's ability to produce some services/products which customers know them as having higher value than other competitors' services/products. Porter [17], on the other hand, focuses on the competitive advantage based on the competitive strategy framework. He posits that the competitive strategy is about finding the firm's position in its competitive environment.

Barney states that a firm will achieve the competitive advantage if its activities in the industry or market create some economic value and also if a few competitors imitate such activities. He relates the competitive advantage to the firm's performance and believes that a firm will achieve to its higher than normal performance when it can create more value than what is expected from its available resources [18].

Narasimhan and Thalluri investigate the investment behavior of collaborating supply chain partners engaged in product development/innovation based competition. They suggested that collaborating in supply chain can achieve the competitive advantages and one of most advantage is responsiveness power for both of suppliers and Byers [19]. Suppliers-buyer coordination and collaboration involve firms that share resources and capabilities along a value chain. According to Porter [17], capabilities to conduct activities along a value chain are complementary. Furthermore, according to RBV, combining complementary resources and capabilities creates synergies [9].

#### *C. Extended Resource-Based View (ERBV) of the firm*

Given that markets for resources (strategic factor markets) are necessarily incomplete [20], the traditional RBV holds that only proprietary resources developed within the boundaries of the firm can create supernormal profits [20]. Recent studies, however, question this restrictive assumption, insofar as there exists a growing recognition that some strategic resources may lie beyond the boundaries of the firm [18], and that a network of inter-firm relationships may also explain competitive advantage [21]. This change in emphasis has been termed the "extended resource-based view of the firm" [22]. Recognition of the extended RBV arguing that competitive advantage is derived from both internal and external assets, has led to the study of resources outside the boundaries of the firm. Recent work, particularly within the strategic management field, has emphasized the inter-firm relationship as a means to acquire external resources and capabilities [21, 22]. The external relationship thus acts as a vehicle to acquire those resources required to fill a particular "resource gap" [23], defined as the difference between a firm's strategic goals and its current resource endowments [24]. Examples of external resource acquisition include both intangible resources such as the transfer of knowledge [25], R&D capabilities [26], and tangible resources such as technology [27].

Less attention has been given to the role of inter-firm relationships in accessing external resources and capabilities. A firm may choose to access an external resource to improve performance where it is considered that integration or acquisition is inefficient or unwarranted. By exploiting complementarities in capabilities, access relationships enable firms to increase customer-perceived value while retaining distinctive capabilities within the firm boundaries. If we accept this extension, competitive advantage becomes attributable to both the unique resources and capabilities of the firm, as well as those firms within its network. This strongly suggests that the unit of analysis of the RBV should be adjusted from the level of the firm to the dyadic or network levels and that firm level accounts of competitive advantage may not offer a complete picture where external resources and capabilities also help to explain performance differentials [28].

#### *D. Supplier Modularity and Flexibility*

Modular production is one measure that eases disassembly and reassembly by decreasing product complexity, lowering the number of parts used in products, and raising the interchangeability and commonality of components [29],[30] This measure uses generic modules that are interchangeable in a number of different finished products and can contribute to more efficient product differentiation in response to customer orders. Modularity also allows for rapid and easy final modification in the distribution channel [30].

Three logistics advantages of a modular product design include standardization of parts combined with postponed differentiation of products, shortening of total lead time because modules can be manufactured simultaneously and it is easy to isolate potential quality problems [31]. The greater the tolerance between modules for replacing them with

different ones, the higher the responsiveness in final assembly for customer needs [30].

Of the factors by which supply chains compete, flexibility can be rightly regarded as a critical one. Being flexible means having the capability to provide products/services that meet the individual demands of customers. Some flexibility measures include: (i) product development cycle time, (ii) machine/toolset up time, (iii) economies of scope (Christopher, 1992)—refers to the production of small quantities of wider range (e.g. JIT lot size)—and (iv) number of Inventory turns.

III. CONCEPTUAL MODEL AND HYPOTHESES

Fig 1 illustrates the conceptual model.

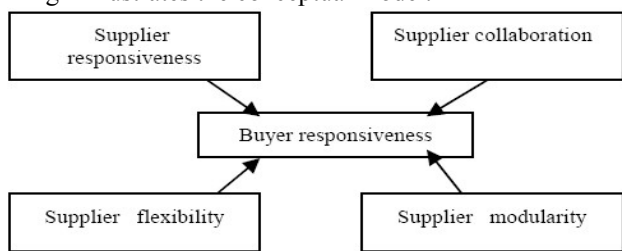


Fig. 1. Conceptual model

Based on conceptual model hypotheses are:

- H1- Supplier firm responsiveness positively effects buyer firm responsiveness.
- H2- Supplier firm flexibility positively effects buyer firm responsiveness.
- H3- Supplier firm modularity positively effects buyer firm responsiveness.
- H4- Collaboration firm positively effects buyer firm responsiveness.

IV. METHOD

The research geographical limit includes Lourestan and Hamedan Provinces. Among the furniture stores in these two provinces, the selected ones for the study have their own workshops. According to James Stevenson's (1996) proposed design, a good rule of thumb says that considering 15 subjects for each of the predictive variable in multivariate regression analysis is sufficient number using the standard least squares method. Since the structural equation modeling fits completely with multivariate regression analysis, so it is logical to consider 15 subjects for each of the variables in the structural equation modeling (SEM). Bantler and Chou (1988) remind that researchers can decrease their sample volume to even 5 subjects for parameter estimation in the SEM analyses. Therefore, sample volume is determined as follows:

$$Q \times 5 < \text{Sample volume} < Q \times 15$$

$$20 \times 5 < \text{Sample volume} < 20 \times 15$$

It means that the minimum and maximum values for sample volume are 100 and 300, respectively. Using factor analysis models, Lohin (1992) has reported some findings which are similar to Monte Carlo Simulation. His literature review indicates that in such models, a researcher may plan to include 100 or more e.g. 200 subjects in his/her sample. Out of 350 questionnaires distributed, 220 were returned. The

simple random sampling was used in sample selection.

Data collection was based on field method and questionnaire. The 5-point scale has been used in measuring the research variables based on corresponding questionnaire. The content validity and confirmatory factor analysis are employed to measure the questionnaire validity. Then 30 questionnaires were distributed as a pretest. Using SPSS software it is confirmed that the questionnaire had desired reliability with  $\alpha$  value as 0.89 and then its high reliability is confirmed.

V. ANALYSIS

A. Fitness of Model

The path analysis has been used to test the research hypotheses. The path diagram is a tool to display which variables have created some changes in the other considered variables. If the model depicted in the path diagram format is confirmed by the model fitness indexes, then the path diagram will be used in testing the proposed hypotheses to find the casual relationship between the variables depicted in the path diagram. So it is necessary to examine the  $\chi^2/df$  statistics ( $\chi^2$  to degree of freedom ratio) and other goodness of fit criteria. With respect to the LISREL software's outputs, the  $\chi^2$  to degree of freedom ratio is 0.885. The ratio is low enough to indicate the model's good fitness because the lower the value is, the more appropriate the model would be.

TABLE I. FITNESS TEST RESULTS

Index name	Index standard	Index in model	Conclusion
$\chi^2 / df$	Less than 2	1.27	Accepted
RMSEA	Less than 0.1	0.052	Accepted
RMR	Less than 0.1	0.066	Accepted
CFI	More than 0.9	0.95	Accepted
NNFI	More than 0.9	0.94	Accepted
IFI	More than 0.9	0.95	Accepted

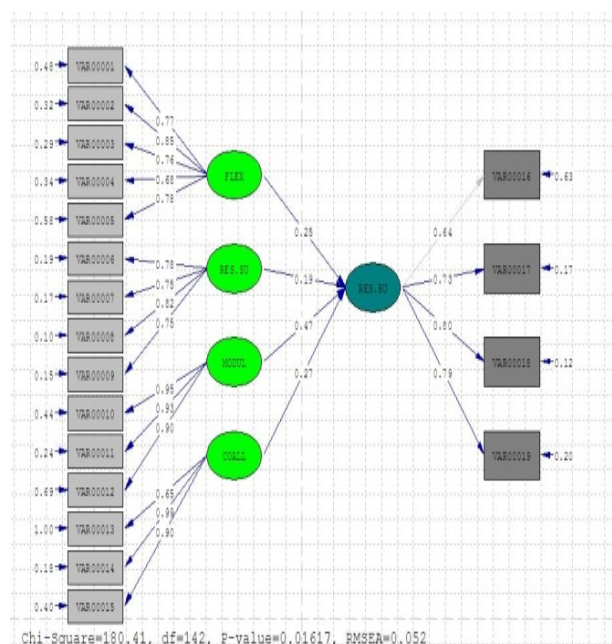


Fig. 2. Structural Model

B. Analysis based on SEM

Based on the structural equation modeling and proposed links, the research conceptual model reveals that the model's hypotheses are significant, positive and meaningful because the SEM's coefficients are indicative of good correlations between the considered parameters. As can be seen from Figure1 and factor loadings regarding the variables assumed links, Fig 2 and Table1 show the analysis results.

Table.2 shows, path coefficients with t-value up 1.96 indicate that the corresponding hypotheses should be supported.

TABLE II: FITNESS TEST RESULTS

Hypotheses	Standard Coefficient	t-value	Conclusion
Supplier responsiveness positively effects buyer firm responsiveness	0.52	3.11	Supported
Supplier flexibility positively effects buyer firm responsiveness	0.19	2.18	Supported
Supplier modularity positively effects buyer firm responsiveness.	0.47	3.75	Supported
Supplier Collaboration positively effects buyer firm responsiveness	0.27	2.72	Supported

VI. DISCUSSION AND CONCLUSION

To bring about improved performance in a supply chain and move closer to attainment of the goals of supply chain optimization, performance measurement and improvement studies must be done throughout the supply chain. All participants in the supply chain should be involved and committed to common goals, such as customer satisfaction throughout the supply chain and enhanced competitiveness.

In today's business world, relationships between suppliers and buyers are less and less governed by pure market or hierarchical mechanisms; rather, they are increasingly governed by hybrid structures that combine market and hierarchy to various extents – namely, strategic alliances. Partners in strategic alliances invest in efficient inter-organizational routines that would not be possible in market relationships. At the same time, supplier and buyer collaboration keeps two or more firms autonomous, retaining high-power incentives and flexibility for partner firms, and thus avoiding the failures of hierarchy.

Some of the studies had solely focused on the internal resources ignoring other external factors and their impacts on the firm's performance. The research results underline the need to identify and consider special strategic resources which are beyond the firm borders and so it extends the RBV.

The responsiveness has incredible effect on the competitive advantage. Some suppliers with higher production capability regarding flexibility, responsiveness

and modularity have a positive impact on the buyer responsiveness. The obtained results confirm the research hypotheses and indicate that supplier collaboration and production capabilities are effective on buyer responsiveness. The research results also show that supplier collaboration improves the buyer responsiveness because the relationship not only is as a tool to access external resources but also is a value-added internal resource which creates competitive advantages [29].

Managers can use the integrated framework proposed here to guide their decision-making about supplier-buyer coordination and collaboration for achieving customer's satisfaction throw increasing responsiveness.

Future research would be empirical work that examines this framework in other industries. Although testing the propositions presented in this study individually is not difficult, conducting empirical work based on the framework as a whole is somewhat more challenging, as the framework is complicated and the unit of analysis of various variables may be different. Nonetheless, empirical efforts for this framework are promising.

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**Habibollah Javanmard** is Assistant Professor in Operation Research at the Management Faculty of Islamic Azad University, Arak Branch, Iran, He is member of IACSIT. He has done extensive research, both theoretically and practically, in many fields of logistics and Production (inventory control, Supply chain and Optimization). He has published papers in scientific journals and undertaken many case studies

Habibollah Javanmard is the corresponding author and can be contacted at: [h-javanmard@iau-arak.ac.ir](mailto:h-javanmard@iau-arak.ac.ir)