

The Role of Strategic Sourcing in Facing Uncertainty of the Manufacturing Business Environment during COVID-19

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The study examines effect of strategic sourcing on operational and financial performances of manufacturing firms in Jordan during COVID-19. Based on a literature review, four strategic sourcing dimensions: strategic purchasing, internal integration, information sharing, and development of key suppliers were focused on. Data collected from various levels of managers in manufacturing firms of food products in Amman, Jordan was used to test the proposed research model. A quantitative approach was employed, and a survey conducted using a structured questionnaire to collect primary data during COVID-19 period. The final sample included 196 respondents, representing a 65% response rate. Structural equation modeling (SEM) method was applied to test and validate the proposed research model. The research model confirmed that there is a significant effect of internal integration and development of key suppliers on operational performance of manufacturing firms during COVID-19. Furthermore, the model confirmed that there is a significant effect of strategic purchasing, internal integration and development of key suppliers on financial performance of manufacturing firms during COVID-19. In order to face challenges created by COVID-19, purchasing managers can use strategic sourcing model to make continuous improvements to numerous activities in each dimension to enhance operational and financial performances of firms.

Key words: *Strategic sourcing, Supplier relationship management, COVID-19, Operational performance, Financial performance*

Introduction

In recent years, the strategic importance of a procurement function has been increasingly emphasised in the context of supply chain management (Çankaya, 2020). The pandemic coronavirus disease (COVID-19) put many challenges on manufacturing firms due to the uncertainty of the global business environment and changes in purchasing function (Su and Gargeya, 2012; Wang et.al, 2020). Disruptions in demand forecasting, quantities of purchasing and production schedules are among the problems caused by COVID-19. This made strategic sourcing, a crucial part of a firm's strategic decision-making process, to require firms to integrate various activities such as procurement, logistics, operations and marketing (Gottfredson et al., 2005; Wang et.al, 2020).

Strategic sourcing can be defined as a comprehensive process of buying all inputs to run a company's operations as well as managing suppliers, in order to achieve long-term objectives (Smeltzer et al., 2003). Other definitions indicate that strategic sourcing is a framework that should use suppliers' capabilities in the manufacturing process to achieve an organisation's strategic objective. This framework can assist managers to make appropriate buying decisions while considering competitive advantage as a primary driver (Su and Gargeya, 2012).

In the complex business environment with severe competition, proactive sourcing decisions are important to deal with environmental changes, risks and uncertainties surrounding manufacturing firms. In addition to cost considerations, sourcing decisions affect production, marketing and financial liquidity issues (Su and Gargeya, 2012). Purchasing managers should acquire critical information regarding the supply market, alternative sources of supply and demand-supply uncertainties. Since COVID-19 has disrupted business, manufacturing firms are facing demand imbalances. Therefore, strategic sourcing is important to face inventory challenges, uncertain supplier lead times and supply risk disruption especially in a single-source situation (Deloitte, 2020). Consequently, strategic sourcing can contribute to firms' ability to achieve a position that is more competitive and prepare them for future competition (Paulraj, 2007). Thus, the present study aims at examining the effect of strategic sourcing on the operational and financial performances of manufacturing firms in Jordan during the global pandemic COVID-19.

Literature review

Since suppliers are critical to the excellence of supply chain performance, organisations must pay more attention to managing their suppliers' relationships effectively and efficiently (Forslund, 2014; Jum'a, 2020). Therefore, companies are putting more effort into managing activities related to supplier relationship management and in choosing an effective purchasing strategy (Amoako-Gyampah *et al.*, 2019). A study conducted on 1,190 firms across Jordan highlighted the significant impact of COVID-19 and the lockdown on firms and employees. All surveyed firms faced challenges in terms of financial liquidity issues, supply and demand

variability and the disruption of supply chains (ILO report, 2020). Previous studies indicated the need for strategic sourcing to have a more strategic role in manufacturing firms especially in the age of increasing competition and uncertainties found in the market such as COVID-19 (Kang et al., 2009; Su and Gargeya, 2012; Wang et al. 2020). Strategic sourcing is responsible for managing and designing supply networks to align with firms' operational performance and financial goals. Therefore, strategic sourcing decisions do not only include evaluating and selecting suppliers but integrating and developing long-term relationships with suppliers (Talluri and Narasimhan, 2004). These well-established supplier relationships could lead to the achievement of a competitive advantage especially in competitive and uncertain market conditions such as COVID-19 (Çankaya, 2020). This study examines strategic sourcing in terms of four dimensions suggested in the study by Kocabasoglu and Suresh (2006). These dimensions may be listed as strategic purchasing, internal integration, information sharing and development of key suppliers.

Strategic purchasing

The purchasing function has gained an increasing importance in manufacturing firms as competitive markets are changing rapidly (Kim et al., 2015). Strategic purchasing is considered an antecedent of financial performance and has a positive impact on a firm's financial performance (Chen et al., 2004). Moreover, strategic purchasing has become a strategic resource rather than a normal function in a firm as it constitutes a solid base for establishing effective communication and building long-term relationships with suppliers (Kim et al., 2015). Considering that COVID-19 has brought high uncertainty in business environments and unpredictable change in supply and demand, purchasing can play a crucial role in tuning the relationship between manufacturing firms and suppliers (Kocabasoglu and Suresh, 2006; Wang et al. 2020). Therefore, strategic purchasing is defined as the key function of the strategic role of purchasing activities in a firm's long-term planning (Chiang et al., 2012). From the discussion above, the study suggests:

H1: Strategic purchasing significantly influences operational performance of manufacturing firms of food products during COVID-19

H2: Internal integration significantly influences operational performance of manufacturing firms of food products during COVID-19

Internal integration

One of the most important aspects in strategic sourcing is the internal integration that is based on communication between the purchasing department and other departments within a firm (Chiang et al., 2012). The strategic role of sourcing played by a firm enforces several departments to have more frequent and intense communication in order to be proactive and deal with situations such as COVID-19 (Salam and Khan, 2018; Yin et al., 2020). Studies show

that there is a positive relationship between the coordination, communication and support of interdepartmental activities with the purchasing department in developing sourcing strategies and improving a firm's performance (Sislian and Satir, 2000; Knight et al., 2014). Therefore, purchasing managers can help in performing tasks related to suppliers such as selection and developing strategies (Knight et al., 2014; Salam and Khan, 2018). This information flow can provide firms with valuable inputs that help them manage their suppliers in a comprehensive manner (Knight et al., 2014). Cross-functional teams demonstrate the level of engagement across departments in the managerial decisions regarding suppliers, such as selection and development (Salam and Khan, 2018). Thus, internal integration can refer to the communication between purchasing departments and other departments through cross-functional teams that are responsible for sourcing decision-making activities. Based on the previous studies, the following hypotheses were developed:

H3: Information sharing significantly influences operational performance of manufacturing firms of food products during COVID-19

H4: Development of key suppliers significantly influences operational performance of manufacturing firms of food products during COVID-19

Information sharing

Information sharing between firms and suppliers can be very helpful as it serves as a basis for improving operations and conducting complex purchasing strategies especially in COVID-19 times (Zhou and Benton, 2007; Paul and Chowdhury, 2020). Sharing information such as production schedule and costs can help manufacturing firms and suppliers to make effective decision-making processes and achieving efficiency in production (Matopoulos et al., 2009; Flynn et al., 2010). Moreover, the communication and information sharing between suppliers and firms allows formation of better cooperation and promotes more collaboration between them that ultimately leads to achieving a competitive advantage in the whole supply chain (Kim and Chai, 2017; Jum'a, 2020). Studies showed that suppliers could possibly affect the performance of manufacturing firms through managing inventory levels and coordinating production schedules. The information sharing could be more effective by using IT technologies that help suppliers and manufactures to synchronise their data (Jum'a, 2020; Pal, 2020). Moreover, timely and accurate information sharing and flow with key suppliers can improve the process of sourcing and consequently affect the firm performance positively (Paul and Chowdhury, 2020). Thus, this dimension can be referred to in the behaviour of coordination and information sharing between suppliers and manufacturing firms. Hence, the following hypotheses were suggested:

H5: Strategic purchasing significantly influences financial performance of manufacturing firms of food products during COVID-19

H6: Internal integration significantly influences financial performance of manufacturing firms of food products during COVID-19

Development of key suppliers

Development of key suppliers depends on how close the relationship between the manufacturer and their key suppliers. Supplier development can be defined as a long-term cooperation between the manufacturer and its suppliers to develop supplier capabilities in designated areas of improvement (Monczka et al., 2016). Supplier development activities can be conducted by establishing common goals between key suppliers and purchasing firms along with a sharing mechanism for development activities where both parties can dedicate resources to achieve the planned goals (Yawar and Seuring, 2018). Development of key suppliers can promote financial and operational performances. However, manufacturing firms need to take into consideration that relying on a small number of suppliers can increase the chance of having supply chain disruption especially in an uncertain environment as seen with COVID-19 (McMaster et al., 2020). Key suppliers' skills and performances should meet or exceed the requirements of manufacturing firms in order to compete effectively during COVID-19 (Çankaya, 2020). Therefore, firms should invest in specific relationships with key suppliers, which might improve firms' performance and reduce their supply uncertainty (Chiang et al., 2012). Thus, the last hypotheses were proposed:

H7: Information sharing significantly influences financial performance of manufacturing firms of food products during COVID-19

H8: Development of key suppliers significantly influences financial performance of manufacturing firms of food products during COVID-19

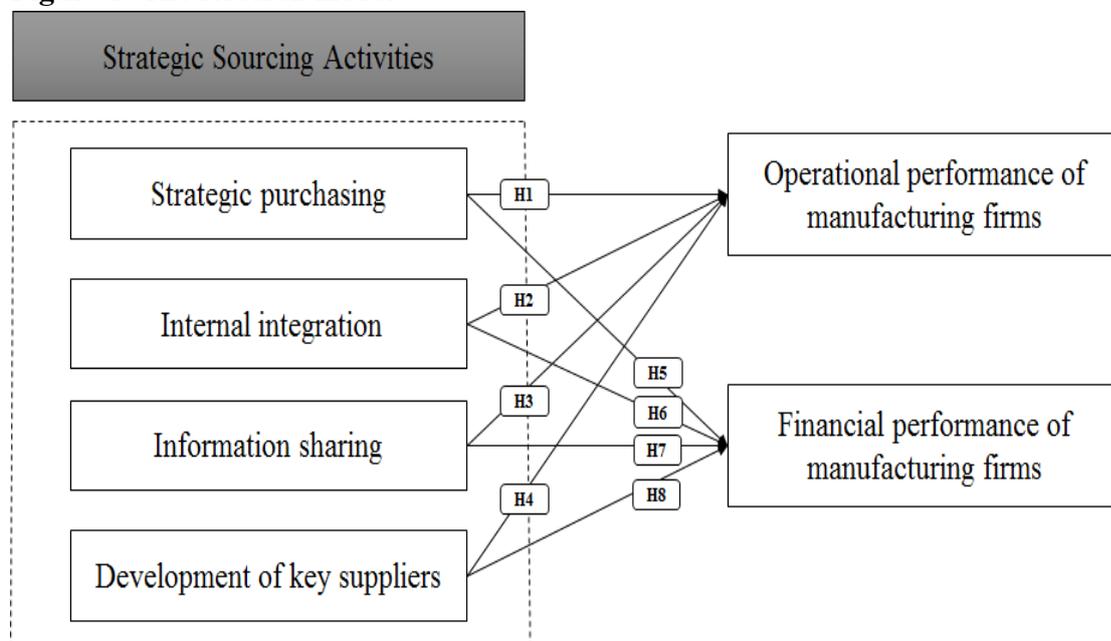
Operational and financial firm performance

Studies showed that there is a positive relationship between effective strategic sourcing and the performance of manufacturing firms (Su, 2013; Chowdhury et al., 2019). COVID-19 might create deviations in the supply and consequently negatively affect operational and financial performances of manufacturing firms. Operational performance of manufacturing firms refers to their ability to satisfy customers and meet their requirements in terms of providing better customer services, responding quickly to changes in market demand and providing an accurate on time delivery (Flynn et al., 2010). On the other hand, financial performance refers to the financial performance of manufacturing firms for a certain period such as COVID-19 measured by several indicators such as sales, profit and return on investment (Kim et al., 2015).

The research model

The proposed research model presented in figure 1 is adopted from previous researches covered in the literature review section. The strategic sourcing activities consists of four dimensions namely, strategic purchasing, internal integration, information sharing, and development of key suppliers. The dependent variables are the operational and financial performances of manufacturing firms. The strategic sourcing constructs was based on the study of Kocabasoglu and Suresh (2006) and each dimension was measured through three items. The operational performance was measured through three items based on the study of Flynn et al. (2010). Finally, the financial performance was measured through three items based on the study of Kim et al. (2015).

Figure 1. The research model



Methodology

Data collection

The data was collected from manufacturing firms of food products located in Amman, Jordan. The survey questionnaire was developed in English based on the literature review as shown in the previous section and the questionnaire was sent for feedback to two academic lecturers in supply chain management and a supply chain manager of one of the food products manufacturing firms in Amman, Jordan. The questionnaire was well understood. The questionnaire consisted of two sections: the first section covers demographic data about the manufacturing firms. The second section covers all variables measuring strategic sourcing dimensions, operational and financial business performances of the firms. A five-point Likert

scale was used for all items where 1= “Strongly disagree” to 5= “Strongly agree”. Following distributing 300 questionnaires, the usable ones were 196, representing a 65 per cent response rate. The proposed research model was analysed and tested using SPSS and AMOS version 22.

Sample characteristics

The sample has been classified into six sectors of manufacturing firms of food products in Jordan. The sample details regarding the number of respondents in each sector in Jordan, along with their respective percentages, are shown in Table 1.

Table 1: Sample characteristics

Demographics	Description	Number	Percentage
Firm Size	Small (< 20 employees)	66	34%
	Medium (20 - 99 employees)	93	47%
	Large (100 employees and more)	37	19%
Type of Firm	Vegetable and animal oils and fats	30	15%
	Dairy products	42	21%
	Grain mill products	13	7%
	Bakery products	55	28%
	Chocolate and sugar confectionery	25	13%
	Other food products	31	16%

As can be seen from table 1, the bakery products notably make up 28% of the sample, whereas 21% fall to dairy products, whilst the remaining 51% are respondents from other food products manufacturing sectors in Jordan. The sample has been classified into three types of organisations, according to the number of employees in each type, ranging from small, medium and large organisations. As can be seen from table 1, the dominating type of organisation is the medium enterprises, which constitute 47% of the sample, followed by small organisations at 34%, and then followed by large organisations at 19%. This reflects that the nature of most organizations in Jordan that fall under the category of small to medium organisations.

Data analysis

Structural Equation Model (SEM) analysis

A Structural Equation Model was employed through AMOS to assess the measurement model and to examine the reliability and validity of the constructs of the study variables: strategic purchasing (SP), internal integration (IN), information sharing (IS), development of key suppliers (SD), operational performance (OP), and financial performance (FP). At first

reliability and validity analysis was conducted to assess the constructs used in the study as shown in table 2.

The loadings of the six factors were at 0.70 and greater showing good convergent validity. The result shows that the values of all the constructs are more than the suggested value of 0.70 for composite reliability (CR) and more than 0.7 for the Cronbach's alpha (Peterson, 1994; Hair *et al.*, 2014). As suggested by Urbina (2014) that alpha .90 or above is the best reliability value to carry on further testing. The average variance extracted (AVE) ranged between 0.70 and 0.85 suggesting high convergence considering that the recommended threshold is 0.50 (Fornell and Larcker, 1981).

Table 2: Constructs reliability and validity

Constructs	Items	Loadings	Alpha	CR	AVE
SP	SP1	0.80	.91	0.90	0.85
	SP2	0.81			
	SP3	0.72			
IN	IN1	0.90	.95	0.95	0.79
	IN2	0.91			
	IN3	0.90			
IS	IS1	0.72	.91	0.92	0.73
	IS2	0.70			
	IS3	0.70			
SD	SD1	0.90	.93	0.93	0.70
	SD2	0.82			
	SD3	0.82			
OP	OP1	0.80	.95	0.95	0.74
	OP2	0.82			
	OP3	0.83			
FP	FP1	0.90	.95	0.92	0.73
	FP2	0.84			
	FP3	0.90			

The result in Table 3 shows that the discriminant validity is achieved for further analysis as Pearson-product moment correlation analysis was computed to assess the relationship between study variables. This indicates that statistical data confirms that the proposed measurement model is satisfactory for further analysis (Fornell and Larcker, 1981).

Table 3: Correlations among Study Variables (N = 196).

Variables	TSP	TIN	TIS	TSD	TOP	TFP
TSP	-	.743***	.516***	.696***	.583***	.693***
TIN	-	-	.650***	.787***	.704***	.771***
TIS	-	-	-	.564***	.508***	.524***
TSD	-	-	-	-	.733***	.747***
TOP	-	-	-	-	-	.758***
TFP	-	-	-	-	-	-

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3 shows the relationship among study variables. Results of Pearson product moment correlation shows that SP, IN, IS, and SD, have significant positive effect on operational performance and financial performance. SEM was employed through AMOS to assess the study variables. Model fit presented in table 4.

Table 4: Goodness of Fit Indices for SP, IN, IS, SD and operational performance, financial performance (N=196).

Model	χ^2 (df)	P	CFI	NFI
Model A	501.78 (7)	>.001	.43	.43
Model B	32.53 (1)	>.001	.96	.96

Note. Model A= with all the parameters of the study, Model B= after adding six co- variances, df= Degrees of Freedom, CFI= Comparative Fit Index, NFI= Normed Fit Index

Table 4 indicates that the relationship between SP, IN, IS, SD and operational performance, financial performance. As shown from the above table the insignificant value of chi-square and various fit indices provide a comprehensive indication of excellent fit of the data with the tested model B. Model B fits excellently with .96 values of CFI and NFI which should be more than .9 (Kenny, Kaniskan, & McCoach, 2015). The co-variances drawn in model B are SP, IN; IN, IS; IS, SD; SP, IS; IN, SD; SP, SD. The paths drawn in the model B are shown in figure 2.

Hypotheses testing and results

Figure 2 shows the final model with all the significant predictions, for which the values of goodness of fit and indirect effects were obtained. The model adequacy indicated a statistically fit structured model with $p < .05$. Consequently, Table 5 summarised the hypotheses tests results.

Figure 2. Structural Equation Modelling results

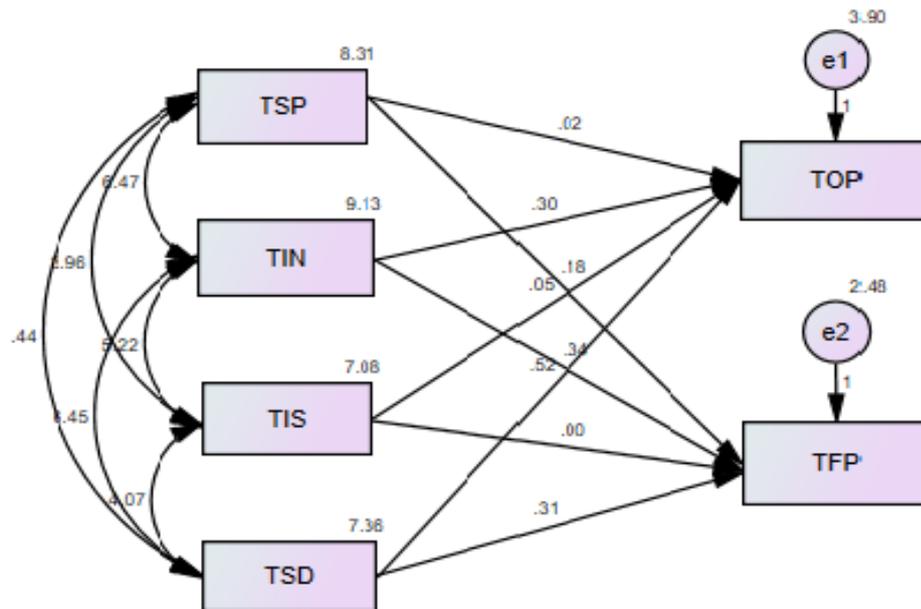


Table 5: Hypotheses test results

Hypothesis	Cause & Effect	β	SD	t-value	p-value	BCa-CI	Decision
H1	SP \rightarrow OP	.02	2.89	.22	.82	-.135-.169	Not Supported
H2	SP \rightarrow FP	.20	2.89	2.93	.004	.060-.301	Supported
H3	IN \rightarrow OP	.03	3.02	3.33	.001	.124-.485	Supported
H4	IN \rightarrow FP	.40	3.02	4.70	.000	.198-.485	Supported
H5	IS \rightarrow OP	.46	2.66	.71	.47	-.089-.191	Not Supported
H6	IS \rightarrow FP	.001	2.66	.024	.981	-.111-.113	Not Supported
H7	SD \rightarrow OP	.45	2.71	5.80	.000	.341-.692	Supported
H8	SD \rightarrow FP	.31	2.71	4.40	.000	.171-.451	Supported

The results showed that all strategic sourcing constructs are affecting the operational performance (OP) of manufacturing firms of food products. However, strategic purchasing (SP) does not significantly affect OP as the p -value=.82 is higher than .05. Therefore, the result does not support the hypothesis H1. The internal integration (IN) has a positive significant effect on OP with a beta coefficient value of $\beta=0.03$ that shows a relatively weak effect on OP supporting the hypothesis H3. The information sharing (IS) has a positive significant effect on OP with a moderate effect as $\beta=0.46$ supporting the hypothesis H5. The development of key suppliers (SD) has a positive effect on OP with a p -value=.47 that is higher than .05. Therefore, the result does not support the hypothesis H7.

On the other hand, all strategic sourcing constructs are affecting the financial performance (FP) of manufacturing firms of food products. SP has a positive significant effect on FP with a beta coefficient value of $\beta=0.20$ that shows a relatively weak effect on FP supporting the hypothesis H2. IN has a positive significant effect on FP with a beta coefficient value of $\beta=0.40$ that shows a relatively moderate effect on FP supporting the hypothesis H4. IS has a positive effect on FP with a p -value=.981 that is higher than .05. Therefore, the result does not support the hypothesis H6. Finally, SD has a positive significant effect on FP with a beta coefficient value of $\beta=0.31$.

Discussion

Many past studies have instigated the effect of strategic sourcing on performances but not on OP and FP during COVID-19. The research model confirms the relationship between strategic sourcing on OP and FP of manufacturing firms during COVID-19. All strategic sourcing dimensions prove to have a positive correlation with OP and FP. As for the SP dimension that affects the firm's long term planning, the study showed that it has a significant effect on FP but not on OP. Previous studies indicate that SP has been shown to enhance financial and business performance of manufacturing firms (Chen, 2004 et al. ; Cuiang et al., 2012). Since COVID-19 is creating many uncertainties for firms, it is important to have purchasing function involved in the corporate level planning during COVID-19 period especially to maintain better financial performance. As for the IN dimension that focuses on communication between the purchasing department and other departments, the study showed that it has a significant effect on OP and FP. This is supported by previous studies that indicate that IN has been shown to enhance OP and FP of manufacturing firms (Salam and Khan, 2018; Yin et al., 2020). It is crucial for manufacturing firms to have frequent communications between the purchasing department and other departments and to be trained on forming cross-functional teams to run the manufacturing operations effectively during COVID-19. As for IS that represents the coordination and information sharing between suppliers and manufacturing firms, surprisingly the study showed that it has no significant effect on OP and FP. Previous studies addressed the importance of IS on FP and OP. Information such as a production schedule and costs that help manufacturing firms make better decisions regarding production and distribution is necessary (Matopoulos et al., 2009; Flynn et al., 2010). The study showed that IS has a strong positive relationship with

OP and FP but it is not a significant relationship. This can be explained because suppliers and manufacturing firms are confused about the data they can provide to each other during COVID-19 pandemic. The demand uncertainty and transportation hurdles make IS a difficult task for suppliers and manufacturers during COVID-19. As for SD dimension, it is important for manufacturing firms to establish common development goals with their key suppliers and to have a clear implementation mechanism for this development. The study showed that SD has a significant effect on OP and FP. Previous studies stated that DS promotes OP and FP (Monczka et al., 2016; McMaster et al., 2020). During COVID-19, manufacturing firms should provide as much financial and technological assistance to key suppliers as possible in order to ensure providing manufacturers with the expected level of services. Moreover, manufacturing firms should support the training of key suppliers' personnel on quality issues during COVID-19. The development of key suppliers on quality issues is necessary since quality standards including safety are critical during COVID-19 period.

Conclusion

COVID-19 places many challenges on manufacturing firms due to the uncertainty of the global business environment and the changes in purchasing function. The research showed that there is a positive effect of strategic sourcing dimensions namely: strategic purchasing, internal integration, information sharing and development of key suppliers on operational and financial performances of manufacturing firms of food products in Jordan. The research model confirmed that there is a significant effect of internal integration and development of key suppliers on operational performance of manufacturing firms during COVID-19. Moreover, the model confirmed that there is a significant effect of strategic purchasing, internal integration and development of key suppliers of manufacturing firms on financial performance of manufacturing firms during COVID-19. The research model of strategic sourcing dimensions can be used by purchasing department practitioners to make continuous improvements to numerous activities in each dimension to enhance operational and financial performances of firms. Purchasing managers should improve activities related to internal integration and development of key suppliers as they have a significant influence on both operational and financial performances of firms during COVID-19. Manufacturing firms are recommended to have more frequent communications between purchasing department and other departments, to have effective use cross-functional teams, provide technological and financial support to key suppliers and to focus on training suppliers on quality issues related to firms. In addition, purchasing managers should involve strategic purchasing in the long term strategic planning of firms during COVID-19 since it has a significant effect on financial performance of firms. The study has some limitations, using a probability technique in sampling rather than a non-probability technique in order to generalise results in the context of the study especially during COVID-19 period. Moreover, the application of the research model in different industries will enhance the applicability and reliability of the model.

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