THE INFLUENCE OF SUPPLY CHAIN MANAGEMENT PRACTICES ON SUPPLY CHAIN PERFORMANCE: THE MODERATING ROLE OF INFORMATION QUALITY

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Abstract. *Purpose* – The main aim of this investigation is to introduce a framework for combining information quality concerning with contextual and representational relevance, and intrinsic accuracy in supply chain management practices to develop supply chain performance in Saudi companies.

Research methodology – Inferential technique used to examine the interplay between constructs of the study. SEM was run in order to assess and estimate the causal relationship among variables.

Findings – The significant effect of information quality on SCP as well as the significant effect of SCMPs on SCP. Furthermore, it was found that the information quality could significantly moderate the interplay between SCP and SCMPs.

Research limitations – This study conducted on 150 Saudi manufacturing companies during the year 2021, in future, the findings can be adapted for other sectors of the Saudi economy.

Practical implications – This study has implications for the industrial managers and key personnel. The study provides strong evidence revealing that higher level of integration between SCMPs and quality of information can lead to enhanced supply chain performance.so the proposed model can be used in the practical activities of service sectors In the future; it is possible to change and/ or add key variables and further expand the field of use of the model.

Originality/Value – The study contributed in determining main practices of supply Chan management in industrial sector of Saudi Arabia considering their influence on supply chain performance, as well as this study contributed in showing the engagement of information quality in supply chain management.

Keywords: supply chain management practices, supply chain management, information quality, supply chain performance, Saudi manufacturing companies.

JEL Classification: L15, L60, M10, M11.

Introduction

Todays, the intense competition in the business environment demands an increasing concentration on transmitting values to the clients. The main purpose in most businesses is to

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present kinds of items and services that are considered more precious than those of its competitors. Besides client value, the marketplace, where businesses are running today, is widely regarded as being turbulent and complex (Christopher, 2000; Goldman et al., 1995). All types of organizations consider supply chain management (SCM) as a critical strategy, which is mainly employed to increase the competitive position (Li et al., 2006) as SCM pays more attention to the flows of information, material and cash between customers and suppliers or vice-versa (Wibowo & Sholeh, 2015). Indeed, the firms have recently encountered various types of problems and threats in the turbulent business and unexpected requirements. Further, the organizations follow an appropriate supply chain strategy (SCS) to use available chances in order to resolve uncertainty. Additionally, the flow of information, materials, knowledge, and cash demands an efficient information system which enables information quality sharing among supply chain partners (i.e., suppliers, distributors, manufacturers, and customers) to reduce the uncertainty and enhance supply chain performance (SCP). Hence, the supply chain needs to design a strategy which conform to the goods, markets, and target clients (Hallavo, 2015).

Cigolini et al. (2004) and Li et al. (2006) have noted that the practices of SCM have not received enough attention from researchers in business. This lack of studies can be ascribed to SCM's interdisciplinary structure as well as its developmental features, which has led to a state of a theoretical distortion from the perspectives of its perceptions. Research on SCM practices that has been conducted in certain countries and industries needs to be interpreted within the particular contexts of these countries along with their distinct characteristics, which can help narrow the gap between SCM application and its theory.

The present study aims at empirically examining a framework in order to explore the moderating function of information quality in the interaction between the performance of supply chains and SCM practices of manufacturing companies in Saudi Arabia. Accordingly, SCM practices are referred to as a range of activities that unify all different groups involved in SC including suppliers, distributors, goods producers, and clients in order to boost SC activities and achievements (Barros, 2006; Koh et al., 2007). The SCM practices examined in this study were designed, reviewed, and validated in the past studies done by Green Jr et al., (2008), Cook et al. (2011), Tan (2002), and Li et al. (2006). These actions consist of six components: Level of Information Sharing, Strategic Supplier Partnership, Customer, Internal Lean Practice, Relationship Management, and Postponement. They are defined as strategic practices, covering both past and future aspects of the SC. As the SC and its function are appealing to the scholars and researchers, this investigation seems to be contributing to the industries and literature. This will be done by examining the SCM practices that result in enhancing SC performance which is related to supply chain in terms of its cost, quality, and lead time as well as the moderating information quality which itself consists of accuracy, timeliness, validity of exchanged information, and adequacy (refer to Li et al., 2006). After collecting data through the survey, the variables are operationally assessed. Structural equation modelling, widely known as SEM, and inferential statistics were used for assessment and validation of the hypothesized interactions. This study intends to provide scholars, more particularly, producing companies with insights that are connected with the perception of SCM practices and with scope connected to their SCM practices which can prominently

affect not only their SC but also the entire company. The present investigation therefore can effectively guide Saudi manufacturing organizations in terms of SCM practices. It is also a validated tool to test and conduct SCM practices. The study further develops the theory in academia by extending SCM knowledge among developing nations (Cigolini et al., 2004; Li et al., 2006; Min & Mentzer, 2004). Consequently, the findings of the current investigation can enable organizations to address the supply chain performance problems through several practical managerial practices.

The industrial sector in the Kingdom of Saudi Arabia has witnessed a steady development during the past years. A report issued by the "National Center for Industrial and Mining Information" indicated that the total number of existing factories in the Kingdom of Saudi Arabia until the end of October 2021, reached about 10,216 factories, and the reason for this is to the interest and support that this sector finds from the Saudi government through the es-tablishment of industrial cities in various regions (Modon has established 35 industrial cities, including five "industrial oases" suitable for women's work, called "Modon oases"). Recently, the Saudi government launched the National Industries Development and Logistics Services Program, which is one of the most important programs of Saudi Vision 2030, which aims to place Saudi Arabia in the ranks of developed and leading countries. The Saudi industrial sector has a sustainable impact, especially since there is a direct relationship between the future of industries and the rate of economic growth, which calls for the adoption of poli-cies that support the level of productivity and competitiveness the sector in particular the manufacturing sector, which is classified as the main engine of growth. The industrial sector in the Kingdom of Saudi Arabia seeks in all its tools to sort out an environment capable of to achieve the requirements of competitiveness in the current and future stage. Accordingly, the present study was carried out to address three research questions as follows: (1) what kinds of SCM practices could be used in Saudi manufacturing organizations? (2) Is there any relationship between the current SCM practices applied by manufacturing companies in Saudi Arabia and their manufacturing performance? and (3) Does information quality have moderating role in the interplay between SCM performance and SCM practices?..

1. Literature review

1.1. Supply chain practices

The term SCM is mostly used to referred to as synchronizing a firm's procedures with those of its clients and distributors so that the flow of information, servicing offers, and materials could be consistent with customers' requests (Krajewski et al., 2019). Hence, the main pur-pose of SCM is to handle the rate and speed of information and materials between a sequence of operations that form the "chains" or strands of a supply network (Slack & Brandon-Jones, 2019). Then, supply chain management will have an important role in the structure of sup-ply chain in order to increase its competitive gain and benefits that are offered to the target client (Lysons & Farrington, 2020).

Academic scholars and managers of business companies have paid increasing attention to the practices of supply chain management (Bani Hani, 2021; Tan et al., 2009; Li et al., 2005; Croom et al., 2000). Numerous manufacturing firms have found supply chain man-

agement practices to play acritical role in generating and keeping a competitive profit at the market (Li et al., 2005). In the practices of SCM, all levels of the SC including distributors, manufacturers, suppliers, and customers are integrated in order to enhance supply chain performance (Barros, 2006; Koh et al., 2007). Researchers have given attention to supply chain management performances from different aspects. For instance, Alvarado and Kotzab, (2001) explored core competences, inter-organizational system, and removal of excess in inventory through postponement. Further, Tan et al. (2009) noted that the main practices of SC include exchange of information, integration of supply chain, management of customer services, JIT capabilities, and geographic proximity. Using a system approach, Min and Mentzer (2004) and Sundram et al. (2016) classified the supply chain management practices: information sharing, agreed-upon prospects and goals, collaboration, dangers and reward sharing, long-standing association, process integration, and planned leadership in SC. Lee et al. (2007) investigated five performances at supply chain level including strategic supplier partnerships, outsourcing, information sharing, customer relationship, and product modularity. Zhou and Benton Jr (2007), in a different study, examined the integration of delivery practice, SC planning, IS, just-in-time (JIT) production in supply chain management. Thatte et al. (2013) defined the practices of supply chain management in the light of customer relationship, strategic supplier partnership, and information sharing. Chan and Lam (2011) assessed the performances of supply chain practices with respect to customer relationships, strategic supplier partnerships, information technology, information sharing, internal operations, training, innovation performance, and operational performance. Sukati et al. (2012) hold that supply chain practices are connected with customer-firm relationships, internal firm relationships, and supplier-firm relationships. In examining SCP, Al-Shboul et al. (2017) applied seven dimensions including information sharing, strategic distributor association, client connection management, information quality, postponement, management of total quality, and internal lean performances. The present investigation employs the following parameters to examine SCMP in consumer goods industry in Saudi Arabia: customer relationship (CRM), strategic supplier partnership (SSP), information sharing (IS), internal lean practices (ILP), and postponement (P).

1.2. Supply chain performance

In the past decade, many industries have used SCP as a vital source of durable competitive leverage (WH Ip et al., 2011). It is argued that companies have to improve their supply chain performance progressively in order to gain the prosperity and supremacy of the supply chain in the global business (Acar & Uzunlar, 2014). Although some studies have brought supply chain practices and theories to the center of attention, there has not been enough attention to the supply chain performance. As, today firms face various challenges due to intense competition not only between supply chains but also between organizations themselves (Abdulameer & Yaacob, 2020), promoting the supply chain performance is not restricted to the organization exclusively. Yet, any factor of downstream or upstream could have a prominent role in enhancing the supply chain performance (Cai et al., 2009). Furthermore, upgrading the supply chain performance does not make a difference for companies that provide services

or produce goods (Basu et al., 2017). Therefore, it seems necessary to draw more importance to the supply chain performance in companies. Meanwhile, researchers have pointed out that no single measure has been offered to represent the supply chain performance (Saleheen et al., 2018; Anand & Grover, 2015). Banomyong and Supatn (2011) refer to supply chain performance as a system that accounts for several performance measures connected to the SC members, as well as the coordination and integration of their performances. Several scholars have indicated that development and selection of the appropriate criteria to assess the supply chain performance have always been a challenging task (see Anand & Grover, 2015). This challenge is usually attributed to the hardship of coordinating many organizations that form the supply chain, as well as performances in the firms (Subburaj et al., 2015; Dweekat et al., 2017; Alam et al., 2014). Ahi and Searcy (2015) also highlighted the difficult and challenging aspect of assessing supply chain performance. Additionally, Harland et al. (1999) puts that the majority of the measurements of conventional actions are directed towards economic landscape.

Previous research has offered a wide range of criteria that were used to measure supply chain performance. Some scholars have noted that supply chain performance could be assessed with respect to cost, service level, inventory level, throughput efficiency, and supplier performance (Stevens, 1990). Pittiglio, Rabin, Todd, & McGrath (1994) approached the SCP measurement from four different dimensions: cost, customer satisfaction/quality, assets, and time. Spekman et al. (1998) considered cost reduction and client satisfaction in order to measure the SCP. Beamon (1999) offered qualitative criteria to gauge SCPs including the integration of both information and material, flexibility, performances of suppliers, client satisfaction, and effective management of possible risks. The present study puts more emphasis on performance measures that could be used in the practical issues encountered by the manufacturing organizations, namely the issues indicated by Shepherd and Günter (2006) such as quality (or reliability), time, cost, innovativeness and flexibility.

1.3. Information quality

Information quality is the main part of information management as it is processed and developed in a company. The high quality of information can help improve the making process and it brings the organization a competitive advantage (Azemi et al., 2017). Information could have high quality provided that it fits the purpose, which can be evaluated by the users of the information only (Bani Hani et al., 2009; Embury et al., 2009). Information Quality (IQ) is a multidimensional notion, in which many researchers are interested in order to explore and categorize its aspects. Information quality refers to what extent measurement methods employed to prepare information could reflect what a decision maker intends to find out (information relevance) and whether the given methods have been competently used and results have been truthfully depicted (information credibility or reliability) (Kinney, 2000). Operationally, information quality is defined as information which is useful, good, accurate, and current (Rieh, 2002). Li and Lin (2006) argued that ensuring the information quality could play a significant role in accomplishing an effective supply chain management. The main aspects of information quality include both the subjective and objective parameters of, reliability, bias awareness, accuracy, comprehensiveness, validity, credibility, currency, trust,

expertise, transparency, and thoroughness (Laudon & Laudon, 2021; Bani Hani & Awad, 2017; Diakopoulos & Essa, 2008; Li et al., 2006). In this study, the quality of information is measured with respect to four semantic categories as identified by Lee and Levy (2014) and Huang et al. (1999): (1) Representational that is interpretable, understandable, consistence, and conciseness. (2) Intrinsic accuracy that contain; credibility, objectivity, and reputability. (3) Accessibility that related to accessing information securely and easily. (4) Contextual relevance factors that include timeliness, valuableness, information richness, and completeness.

1.4. The influence of SCMP on SCP

It has been proved that the SCM is a critical factor influencing the performance of supply chain. However, empirical studies have shown mixed results. For example, some studies have reported that supply chain management performances are to gain and promote practices through supply chain, which demands integrating both internally with the organization and externally with customers and suppliers (Kannan & Tan, 2010; Kim, 2006). Kumar and Kushwaha (2018) investigated the relationship between operational function of the fair price shops and various SCMPs (information technology or IT, CRM, information quality) in India. They found three aspects of practices in SCM with a positive and significant connection with the practical performance. Saragih et al. (2020) demonstrated that sustainable operational performance can be gained via supply chain practices. Despite the influence of SCMPs on SC performance, supply chain management performances could greatly impact the loyalty and satisfaction of customers, contract design in SC, and pricing rate of supply chain. For example, Prathiba (2020) examined whether customer affiliation, supplier affiliation, and knowledge sharing have any effect on clients' loyalty and satisfaction. The study found the significant influence of SCMPs on clients' loyalty and satisfaction. Thus, although it is agreed that supply chain management practices could influence an organization, it seems critical to precisely assess such impact on supply chain performance in an organization (Green et al., 2006). Further, Alahmad (2021) probed the interplay between SCP and SCMPs in various industries in Saudi Arabia. accordingly, following hypothesis is presented:

H1: SCMPs have statistically significant influences SCP.

1.5. Information quality as a moderating construct

In modern business, in order to be successful in competitive environment, companies need to concentrate on information which strengthen supply chain performance. Literature abounds with research on the effect of information quality (IQ) on SCP, demonstrating the significant role of IQ and information sharing play in improving the SCPs. A study by Afshan et al. (2018) in India showed that information quality is directly related to supply chain collaboration. This, consequently, results in an improvement in supply chain performance. Al-Shboul et al. (2017) also revealed a significant interaction between supply chain performances and information quality within manufacturing organizations. Studying retail firms, Gandhi et al. (2017) reported significant impact of information quality and sharing on supply chain performances. Kim and Chai (2017) conducted a study among the manufacturing companies in South Korea and revealed that information quality and sharing is significantly connected to

SCPs. Sahin and Topal (2019) reported that businesses activities could be affected by information quality and sharing. Thus, as previous studies have indicated, there is a significantly positive connection between SCPs and IQ.

The gap in the past studies proposed that the theoretical framework explaining the way information quality is integrated into supply chain management practices in order to assess their impacts on SCP. It seems that the present study is pioneer in developing a research framework as illustrated in Figure 1.
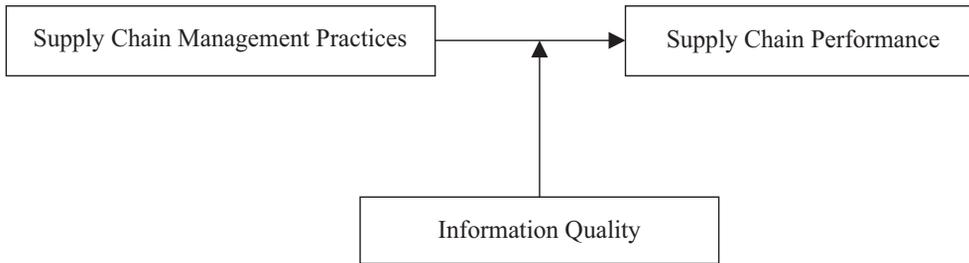

Figure 1. The theoretical framework illustrated the integrating of IQ into SCMPs to improve SCP

According to what mentioned above, the following hypotheses are offered:
H2: IQ has a statistically significant influence on SCP.
H3: IQ plays a significant moderating role between SCMPs and SCP.

2. Methodology

2.1. Participants and collection of data

All the general and functional executives in Saudi Arabia manufacturing companies form the population of this study. They have been listed in Jeddah Industrial cities becuase they are included in the Saudi Authority for Industrial Cities and Technology Zones (MODEN). As Rahi et al. (2018) suggested, G-Power Software was used in the prior-power analysis in order to measure the sample size. Rahi et al. (2018) argued that factor analysis should be used in measuring the size of the sample with prior-power analysis. According to the results of the prior-power analysis, at least 245 responses are needed in order to project the productivity of an organization. Previous research demonstrated that a rise in the response rate could help decrease the magnitude of error in the sampling process (e.g., Rahi et al., 2018), and Rahi et al. (2020) suggested, according to Rahi and Abd. Ghani (2019), a convenience sampling method is suitable when the list of the respondents is not at hand. The convenience sampling method was adequate to help in engage with actual respondents (Rahi, 2021), and as the purpose of the study was to achieve high veracity from data. Nearly 750 questionnaires were distributed, 150 manufacturing firms volunteered to take part in the research. Each company received five questionnaires, which were filled by general manager (GM), HR manager, finance manager, operations manager, and marketing manager. 500 usable questionnaires were completed and returned with 67% response rate: HR manager (n = 66), GM (n = 113), finance manager (57), operations manager (n = 140), and marketing manager (n = 124).

The responding companies were working in a wide range of areas such as cartoon and paper(18 company), beverages and food (24 company), medical and pharmaceutical products (7 companies), electronic goods (30 company), textiles (26 company), leathers (21 company), ceramic and glass (12 company), and clothing products (12 company). In total, 500 responses were inferentially analyzed.

2.2. The development of the Instrument

The study reported in this paper was carried out to examine the moderating role information quality (IQ) plays in the interaction between SCP and SCMPs, considering the executives' attitudes working in Saudi manufacturing companies based in Jeddah Industrial areas as they are listed in the Saudi Authority for Industrial Cities and Technology Zones (MODEN). To do so, we reviewed a wide range of relevant studies on the central measures of SCP, SCMPs, and IQ.

A questionnaire was designed according to the key variables used in the past studies. The surveys were sent to Jeddah factories with a notification that they need to be filled out by the executives at different levels. The questionnaire contains four sections. The first part pertains to the respondents' demographic profiles; the second section was meant to examine SCMPs; and the third section was to measure SCP. The final section included items for evaluating IQ. The questionnaire was developed in such a way that the major key measures could be addressed in the light of previous literature. The main reason for choosing industrial sector is that this sector is more likely to satisfy the major constructs of this investigation. The Likert scales with a range of "1" *strongly disagree* to "7" *strongly agree* conforms to Rahi et al. (2018), was used in the questionnaire.

2.3. Evaluating common method variance

Data were gathered using a single source, which is based on positivist paradigm. Therefore, measurement of the bias in common method variance seems necessary. Harman's single factor analysis was employed for the sake of approving that the investigation is exempted from such variance. According to single factor analysis developed by Harman, variance should go beyond 50%, which indicates that the data is bias free (Podsakoff et al., 2003). The present findings demonstrate that the variance was 19%, thus confirming that this study is exclusive of any variance bias and, therefore, known as a valid structural model.

3. Analysis of data and results

Following the quantitative method, inferential technique was employed to examine the interplay between constructs of the study. Concerning inferential technique, SEM was run in order to assess and estimate the causal relationship among variables (Rahi et al., 2020; Bani Hani, 2021). SEM involves estimating both structural model and measurement model (Anderson & Gerbing, 1988; Rahi et al., 2020) SEM model show the causal interactions between two or more constructs, while the measurement model measures convergent and discriminant validity of the constructs. To run the models, Smart-PLS was employed (Ringle et al., 2015; Rahi, 2017).

3.1. Model reliability and validity

The internal consistency of the constructs (test reliability) was measured using Cronbach's Alpha with an acceptance level of 0.60 (Sekaran, 2010). Table 1 displays the "alpha" values of all constructs. The Cronbach's Alpha indexes greater than 0.7 not only demonstrate the acceptable level of reliability but also indicate that instruments used in the study are of a good internal consistency (Nunnally & Berstein, 1994; Hair et al., 2013).

Composite reliability (CR) was chosen to calculate the internal consistency of the model, indicating the amount of measure variance underlying the given trait in every single ordered construct of the model. All the CR values had a range between 0.944 and 0.973, exceeding the suggested minimum level of 0.7 (Gefen et al., 2000; Hair et al., 2013), thus demonstrating an adequate consistency (acceptable reliability) in the model.

A confirmatory factor analysis (CFA) was run in order to demonstrate the validity of the model. Discriminate validity is verified provided that the average variance extracted (AVE) exceeds the squared correlations (Fornell & Larcker, 1981). As Table 1 shows, the AVE values ranging from 0.699 to 0.781 were all higher than the level of 0.5 recommended by Bagozzi and Yi (2012) and greater than the squared correlations among the variables (off-diagonal). The measures of average shared variance (ASE) and maximum shared variance (MSV) are found less than that of average variance extracted (AVE), supporting discriminate validity (Hair et al., 2013) (See Table 1). Regarding all the studied constructs, the values met the recommended threshold levels, then demonstrating the satisfactory convergent validity.

As Table 2 reveals the outcomes of the Fornell and Larcker analysis, the measures of AVE (diagonal) were found to be higher than the values of constructs correlation counterparts, thus confirming that the variable is discriminant enough to be used in the assessment of the specific concepts.

Table 1. Validity and reliability indices of the proposed model

Variable	Item	Loading	Cronbach's Alpha	CR	AVE	MSV	ASV
SCMPs	Strategic Supplier Partnership-SSP	0.658	0.88	0.957	0.777	0.547	0.379
	Customer Relationship-CRM	0.671					
	Internal Lean Practices-ILP	0.893					
	Information Sharing-IS	0.950					
	Postponement-P	0.942					
IQ	Intrinsic accuracy-IA	0.967	0.84	0.944	0.781	0.589	0.358
	Representation-R	0.733					
	Contextual relevance-CR	0.837					
	Accessibility-A	0.881					
SCP	Cost -C	0.977	0.87	0.973	0.699	0.539	0.361
	Time-T	0.871					
	Quality-Q	0.945					
	Flexibility-F	0.917					
	Innovativeness-I	0.728					

Table 2. Fornell and Larcker's analysis

Variables	SSP	CRM	ILP	IS	P	IQ	SCP
SSP	*0.871*						
CRM	0.414	*0.881*					
ILP	0.569	0.411	*0.882*				
IS	0.415	0.367	0.406	*0.891*			
P	0.477	0.571	0.467	0.213	*0.911*		
IQ	0.409	0.321	0.658	0.258	0.217	*0.897*	
SCP	**0.478**	**0.351**	**0.708**	**0.376**	**0.053**	**0.357**	***0.866***

3.2. Goodness-of-fit of the model

With reference to Hair et al. (2013), the "goodness-of-fit" of the model was analyzed using different measures, namely absolute fit, incremental fit, and parsimonious fit. As shown in Table 3, 12 indices, which are widely applied by researchers (Hair et al., 2013; Cheung & Rensvold, 2002; Bentler, 1990; Marsh et al., 1988), were used in the current study.

Table 3. Goodness-of-fit indices of the structural model

Measures		Value	Threshold
Absolute fit	Chi-square goodness of fit	921.68	
	p-value	0.000	
	Degree of freedom	499	
	Normed chi-square	1.847	≤3
	Goodness-of-Fit Index (GFI)	0342	≥0.08 0r 0.09
	Root mean squared error of approximation (RMSEA)	0.065	≤0.08
Incremental fit	Tucker-Lewis Index (TLI)	0.971	0.95 and above
	Normal Fit Index (NFI)	0.935	0.9 and above
	Non-Normal Fit Index (NNFI)	0.917	0.9 and above
	Comparative Fit Index (CFI)	0.924	0.9 and above
	Incremental Fit Index (IFI):	0.927	0.9 and above
	Relative Fit Index (RFI)	0.938	0.9 and above
Parsimonious fit	Parsimonious Normed Fit Index (PNFI)	0.779	0.5 and above
	Parsimonious Goodness-of-Fit Index (PGFI)	0.853	0.5 and above

AS Table 2 shows, most of "goodness-of-fit" values were found satisfying and acceptable. Thus, these measures illustrate that the proposed model sound well developed and acceptable. The outcomes of the Fornell and Larcker's analysis revealed that the values of EVA (diagonal) were found greater than those of the constructs' correlation counterparts, hence verifying that construct measures and discriminates distinct concepts (Table 2).

3.3. Descriptive analysis

Table 4 displays the detailed descriptive statistics concerning the respondents' demographics.

Table 4. Respondents' demographics (n = 500)

	Variable	Frequency	Percentage
Age	Less than 30 years	21	0.04
	30–40	188	0.38
	41–50	117	0.23
	More than 50	174	0.35
Education	Bachelor	348	0.70
	Master	121	0.24
	Doctorate	31	0.06
Position	General Manager	113	0.23
	HR Manager	66	0.13
	Operations Manager	140	0.28
	Finance Manager	57	0.11
	Marketing Manager	124	0.25
Experience	Less than 5 years	81	0.16
	5 – less than 10	318	0.64
	More than 10	101	0.20

3.4. Descriptive analysis of the constructs

Table 5 displays the standard deviation and mean in order to answer the research questions of the study. Regarding SCMPs, the standard deviation and the mean values were 0.26 and 3.7, respectively. Concerning information Quality, the values of the standard deviation and the mean were 3.64 and 0.35, respectively. Finally, as for SCP the values of standard deviation and the mean were 0.78 and 3.83, respectively. The values of standard deviation show the level of concentration and homogeneity in the data set as the level of dispersion or variability was smaller.

Table 5. Standard deviation and mean for items domain

Variables	Mean	STD	Rank	Degree
SCMPs	3.75	0.26	2	High
Information quality	3.64	0.35	3	Medium
Supply chain performance	3.83	0.78	1	High

3.5. Hypotheses testing

3.5.1. Normality test

Prior to the linear regression analysis, the assumption of the normal distribution of data needs to be verified. As Table 6 reveals through Shapiro-Wilk test and the level of significance, it is obvious that all the variables of the study are normally distributed. Since all the significance level values are higher than 0.05 in the table, the null hypothesis, which states "there is no statistically significant difference between the normal distribution and the distribution of the variable values at the significance level ($\alpha \leq 0.05$)" is accepted. This finding confirms that the values of the variables have a normal distribution in this study.

Table 6. Normal distribution test using Shapiro-Wilk test

Variable	Shapiro-Wilk test	Sig.
SCMPs	0.98	0.17
IQ	0.95	0.20
SCP	0.91	0.35

3.5.2. SCNPs Influence on SCP

Smart PLS/ bootstrapping technique was used to assess the relevance and significance of the structural model (see Table 6).

Supporting hypothesis 1, the results show the statistically significant effect of SCNPs ($t = 13.71$, $p < 0.001$) on SCP ($\beta = 0.256$), thus indicating the acceptance of the alternative hypothesis (H1) that SCMPs influences SCP.

As correlation confident value between SCP and SCMPs ($R = 0.53$, $p < 0.05$) show, as long as the Saudi factories pays more attention to SCMPs, there will be an improvement in the SCP. Regarding the determination coefficient of the SCNPs-SCP construct ($R^2 = 28\%$), it seems that 28% of the total SCP variance could be interpreted by SCMPs. The residual could be attributed to other variables.

3.5.3. The impact of IQ on SCP

Hypothesis 2 was also supported as the findings show the statistically significant influence of information quality on SCP ($t = 4.78$, $p < 0.01$, $\beta = 0.227$), thus implying the acceptance of the alternative hypothesis (H2) that information quality could impact SCP (Table 6).

According to correlation confident value between SCP and IQ ($R = 0.55$, $p < 0.05$), it could be said whenever the Saudi companies devote more attention to the quality of information, the supply chain performance will experience an improvement. The determination coefficient of the SCP-IQ construct ($R^2 = 30\%$) implies 30% of the total SCP variance could be explained by information quality. The residual could be interpreted in the light of other variables.

3.5.4. The moderating role of information quality in the effect of SCMPs on ACP

As can been seen from Table 7, the quality of information has a moderating role in the influence of SCMPs on SCP (β = 0.514; t = 9.58; p < 0.001), thus indicating that information quality moderates the influence of SCMPs on SCP (alternative hypothesis 3).

Regarding the determination coefficient of the variable (SCMPs-IQ) on SCP (R^2 = 35%), it is shown that the determination coefficient has an increase compared to the first model, implying that the moderating role of information quality helps explain the SCMPs – SCP model.

Table 7. PLS bootstrapping results

Hypotheses	R	R^2	Standard bootstrap results		
			Standard error	t-value	p-value (1-sided)
SCMPs – SCP	0.53*	0.28**	0.017	13.71	0.00***
IQ – SCP	0.55*	0.30**	0.013	4.78	0.00**
[SCMPs & IQ] – SCP	0.59**	0.35**	0.037	9.58	0.00***

Notes: *p < 0.05; **p < 0.01; ***p < 0.001.

4. Discussion

The results showed that the respondents are highly interested in supply chain management practices, information quality, and supply chain performance as appeared in mean values, this is may due to recently growing Saudi government interest in supply chains, in particular logistics services. This result agreed with study by Alahmad (2021), that concluded that supply chain management practices has a direct in influence on supply chain performance. Also, the findings of this study showed that SCMPs correlate with SCP which implies that as long as the Saudi factories pays more attention to SCMPs, there will be an improvement in the SCP. In addition, *SCMPs* have influence on SCP. The findings also showed significant positive correlation relationship between information quality and SCP, which implies whenever the Saudi companies devote more attention to the quality of information, the supply chain performance will experience an improvement, also the findings showed that information quality have influence on SCP. Study of Choy et al. (2004) indicated that high cost will be considered if information cannot be reached effectively with partners in supply chain that may not help to improve supply chain performance. Finally, results showed the Moderating role of Information Quality in the effect of SCMPs on SCP. Study by Marinagi et al. (2015) reveals that information quality as an independent variable affects the supply chain performance, the study also reflects the moderating role of information sharing between information quality and supply chain performance.

Research work related to SCMPs in the manufacturing organizations find a significant correlation between SCMPs and SCP dimensions (Al-Shboul et al., 2017; Ibrahim & Hamid, 2014; Abdallah et al., 2014; Karimi & Rafiee, 2014; Kannan & Tan, 2004). Moreover, other many different previous literature agreed with the findings of this study (Abdulameer & Yaacob, 2020; Ortiz & Gomez, 2017) as they have conclude that supply chain management

practices has a direct positive influence on different aspects of supply chain performance. The managing of supply chain practices will contribute in reduce the total cost, speed the time, improve quality, increase flexibility, and enhance innovativeness of the supply chain management, therefore the suppliers may contribute to improve performance (Subburaj et al., 2015; Utami et al., 2019; Kumar & Kushwaha, 2018; Thatte, 2007). Today the competition between companies has become between supply chains (Li et al., 2006). For this reason, companies should increasingly adopting SCMPs to achieve cost-reductions, speed the time, improving their quality, increasing flexibility, and enhance innovation that lead to enhancing their competitiveness.

Conclusions

The three SCMPs, SCP aspects, and IQ dimensions adopted in this study were developed, examined and validated in the literature. Data were collected from one hundred and fifty Saudi manufacturing companies using a survey questionnaire distributed to executives and analyzing data using statistical measures developed and used to test the proposed experimental model. This study conducted in the Kingdom of Saudi Arabia from the end of the year 2020 to the end of the year 2021. This study, thus, aims to help, manufacturing companies and researchers to better recognize the scope and activities associated with their supply chain that have a prominent role on the effective performance of the entire company. The study, therefore, provides a useful guidance for Saudi manufacturing companies as well as a validated tool for them to measure and implement supply chain management.

This study was an effort to show the influence of SCMPs on SCP. It was also tried to explore whether information quality plays a moderating role between SCP and SCMPs. The study helps grow the body of the literature by specifying the crucial role of information quality in enhancing the impact of SCMPs on SCP on the basis of the managers' perceptions in Saudi manufacturing firms. The results of the statistical analysis highlights significant interplay between SCP and SCMPs, that is, an increase in SCMPs could upgrade the level of Saudi factories' SCP. Moreover, SCMPs significantly influenced SCP. Such a result indicates that a change in SCP could be interpreted in the light of a change in SCMPs. Saudi manufacturing firms are recommended to implement SCMPs to enhance their performance. The results also suggest a significant and positive relationship between IQ and SCP. Thus, this confirms that if more attention is drawn toward quality of information, there will be an improvement in the level of SCP in Saudi companies. Furthermore, the significant influence of IQ on SCP could explain that a change in SCP could be attributed to IQ influence. It was also found that IQ moderates the impact of SCMPs on SCP. Such a moderating role could lead to a change in SCP. More specifically, the moderating role of information quality helps in the perception of the SCMPs – SCP model. Saudi manufacturing firms are recommended to increase the level of interest in information quality as an opportunity to have effective SCP.

The results of this study will have important implications and is believed to be very useful for the Saudi industrial sector and benefited for the public sector since both will be aware of the relatively important factors that should be considered in formulating appropriate strategies.

Current years have seen increase in the significance of integration suppliers, manufacturers, and customers. Effective integration needs intensive concentration on quality of information in terms of intrinsic accuracy, representation, contextual relevance, and Accessibility. Effective integration of suppliers into supply chains serves as a key element to many firms to gain competitive advantage. Thus, the present findings could be valuable to all Saudi managers at all levels at workplace as integrating the quality of information in the practices of supply chain management will help reduce or eliminate the uncertainty and risks, as a result making an improvement in the supply chain performance. In general, it is an important for every manufacturing company to align its SCMPs with information quality to achieve effective SCP; hence, information quality will be an imperative tool to address the alignment process for the companies. Finally, the interesting in information quality would enable companies to study the efficacy of SCMPs and their outcomes in achieving effective supply chain performance.

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