



SUPPLY CHAIN MANAGEMENT PRACTICES AND OPERATIONAL PERFORMANCE OF FAIR PRICE SHOPS IN INDIA: AN EMPIRICAL STUDY

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ABSTRACT. Background: In the current business environment, competition is no longer between the organisations but it is among the supply chains of the organisations. India's public distribution system is one of the biggest systems for food supply and distribution carried out through fair price shop (FPS). There is a wide gap concerning the empirical study on the fair price shops (FPS) and this is the rationale of the study.

The paper aims to determine the relationship between different supply chain management practices and operational performance of the fair price shops in India. The authors propose the theoretical framework and empirically test the model. The study aims to expand the knowledge structure of supply chain management field.

Methods: The paper opted for an exploratory cum descriptive study. The authors randomly selected 200 Fair price shops from a list available on the government website and identified the key persons from each shop as the respondent to get our questionnaire filled. The data were collected using structured questionnaire. Total 200 questionnaires were given to MBA students to collect the data from those fair price shops dealers who qualify the screening questions and situated in Bhopal Madhya Pradesh (India) in the month of March – April' 2017. Finally, 87 useful questionnaires were obtained, with a response rate of 43.5%, Authors employed the PLS-structural equation modelling (SEM) to test the theoretical model and hypothesis.

Results: The study provides that three dimensions of SCM practices have a significant and positive relationship with the operational performance. The paper provides empirical insights about how change is brought about operational performance of the fair price shops. It suggests that supply chain management practices positively & significantly associated with the performance of fair price shops.

Conclusion: This paper emphasizes the importance of supply chain management practices on the day to day operations of the fair price shops and provides an insight that these practices if employed properly they will give an added advantage. The study fulfils an identified need to study how supply chain management practices can impact the performance of fair price shops and the study directly measures the impact of supply chain management practices on operational performance of the fair price shops in India. The biggest limitation of this study is the size of the sample. Thus the research results may not be generalized. Therefore, researchers are encouraged to test the proposed framework at a broader level.

Key words: supply chain management practices, fair price shops, PLS, Structured equation modelling, public distribution system.

INTRODUCTION & PROBLEM BACKGROUND

In the current business world, competition becomes fierce among the organizations as well as the challenges attached with getting a product and service to the right place at the

right time at the right price. To counter these challenges, supply chain management (SCM) is a key concept to manage firms supply chain partner effectively and build long-term partnerships [Fynes et al., 2008; Sambasivan, M. et al., 2013]. Supply chain management has been defined by The Global Supply Chain Forum as “. . . the integration of key business

processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders" [Lambert et al., 1998]. Due to complexity in supply chain firms are facing problems in availing products to market quickly, in the right quantities, and in the right locations [Closs et al., 2008]. Thus, organizations began to realize that it is important to improve efficiencies in its day to day operations to remain competitive. The goal of SCM is to consistently flow the information and material in the entire supply chain to provide an edge over its competitor [Childhouse & Towill, 2003].

The concept and practices of SCM have received increasing attention from Managers, academicians, and consultants [Hamister, 2012]. The understanding and execution of supply chain management (SCM) practices played an important role for organizations to remain competitive and for enhancing profitability in the increasingly competitive global marketplace [Childhouse and Towill, 2003]. The implementation of SCM practices is not limited to manufacturing firms only [Li et al., 2006] but also has been widely employed in the retail sector [Randall et al., 2011].

In India, no significant study on supply chain management practices found and till present supply chain practices in India exhibit inadequate visibility [Srivastava, 2006] so as in the case of public food supply chain in India. It is recognized that since SCM has its effects on firms, thus it becomes necessary to measure the impact of SCM practices on the performance of the organizations [Green et al., 2006].

The issues related to which dimensions are related to SCM practices and its impact on firm's performance has largely unrecognized [Mentzer et al., 2000]. Past studies (Li et al., 2006) have reported the impact of SCM practice on firm performance and competitive advantages using five supply chain management practices as strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing and postponement to represent SCM practices. Banerjee, Mishra [2017], conducted

an empirically study on food retailer in India. They examined the impact of SCM practices on firm performance taking nine dimensions of SCM practices. Singh et al. [2010] included in their list of SCM practices: technology use, SC speed, customer satisfaction, supply chain integration and inventory management.

The Indian public food supply chain system known by a Public distribution system (PDS) is a classic example of the retail food supply chain. In this PDS, the food supply chain comprises many activities: the procurement of agricultural produce, transportation, storage and their distribution to the final consumer which makes it very complex. This system was developed to ensure food security and provision of essential commodities to the weaker people of the society through fair price shops. The products like wheat, rice, sugar etc., are provided at a subsidized rate to the entitled beneficiaries having a ration card.

The distribution of food grains is carried out through fair price shops to reach the end consumer. In the entire supply chain of PDS, fair price shops are the last member of the supply chain. Fair price shops which also known as Ration shops in India are operated either by private owners, by cooperative societies or by the government. The state government issued the licensed for these ration shop owners to sell the commodities. The beneficiaries can purchase their monthly food grains entitlements at subsidized prices from these fair price shops. Although the government has taken care about the smooth running of these fair price shops still it is found that PDS is having many problems like entitled beneficiaries are not getting food grains. The reasons for such failures are attributed to not having a proper supply chain management system. The problem of pilferage exists in every stage of PDS supply chain from procurement to the end consumer. McCorrison & MacLaren [2016], report that "to transfer Rs. 1.00 to the poor costs Rs. 3.14 in the State of Andhra Pradesh and Rs. 4.00 to transfer the same amount in the State of Maharashtra".

There is a wide gap concerning the empirical study about the fair price shops (FPS) and this is the rationale for this study. The aim of the study is to test a theoretical

model identifying the relationships among SCM practices and operational performance of the fair price shops. SCM practices are defined as the set of activities implemented by firms for effective supply chain management. Operational performance is measured and tested empirically, using data collected from respondents using a survey questionnaire. PLS-structured equation modelling is used to test the hypothesized relationships.

The remainder of this paper is organized as follows. Section 2 presents the theoretical framework of each dimension of SCM practices and operational performance and develops the hypothesized relationships. The research methodology and analysis of results are then presented, followed by the conclusion of the study. In the last limitation and future research, the scope has discussed.

THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

Fig. 1 presents the conceptual framework developed in this research. The framework proposes that SCM practices will affect organizational performance directly. SCM practices used in this conceptual framework are customer relationship, information technology, and information quality. A detailed discussion of these SCM practices construct is provided in the following paragraphs along with the organizational performance with the help of existing literature and developed hypotheses related to these constructs. Thus the proposed model for this research will be as shown in figure 1.

Supply chain practices

SCM practices are the activities carried out by an organization to make entire supply chain effective. SCM field is a very popular field which can be seen by the contribution of various researchers [Gunasekaran and Kobu, 2007; Banerjee and Mishra, 2017, Li et al., 2006]. There are different supply chain management practices employed by researchers in the past to see its impact on performance. A study conducted by Li et al. [2006], confirmed that enhanced competitive

advantage and improved organizational performance could be achieved by employing higher levels of SCM practices.

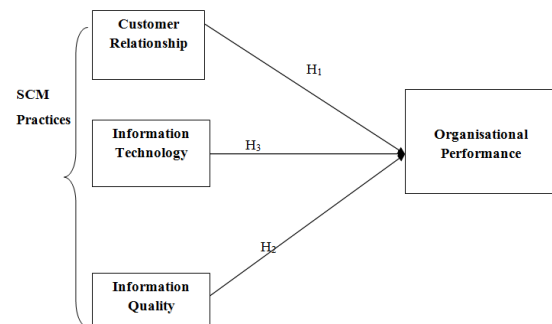


Fig. 1. Proposed conceptual framework

Kutsikos & Sakas [2014], suggest that supply chain practices are related to supply and materials management issues, operations, information technology and sharing, and customer service. Banerjee and Mishra [2017], conducted an empirical study taking nine dimensions of supply chain practices namely Supply chain characteristics, Level of information sharing, Customer relationship, Supply chain integration, Quality of information sharing, JIT capabilities, Inclusion in strategic decision making, Involvement in product quality & development and Mutual trustworthiness. They found that all the supply chain dimensions are strongly related to each other and all the dimensions of SCM practices also strongly relate to firm performance.

Customer Relationship

All those practices which are employed by an organization for improvement in customer satisfaction, building a long-term relationship and handling customer complaints efficiently come under customer relationship. All of we know that customer expectations are very dynamic in nature and organizations need to assess them regularly and adjust their operations accordingly. The existence of good relational information process affects the satisfaction level of customers and their firms' performance is better than those which are not having it [Jayachandran et al., 2005].

A company's customer relations practices can affect its success in managing the supply base as well as its performance [Scott and

Westbrook 1991]. The success of supply chain management depends on the integration of downstream and upstream members of the supply chain. Each member in the supply chain is a supplier as well as a customer. When a customer-oriented strategy is implemented simultaneously with effective supply chain management practices, it can produce a competitive edge in a number of different ways. These include increases in productivity, reductions in inventory and cycle time, increased customer satisfaction, market share, and profits. However, there is little empirical evidence in the literature linking customer relations practices and performance to support the conceptual foundation Tan et al. [1999], conducted a regression analysis and found that customer relations practices directly and positively impact corporate performance.

Customer relationship focused towards knowing about customers to generate products or services for the satisfaction of customer needs [Tanriverdi and Venkatraman, 2005], which in turn improve buyer-supplier relations. For the supply chain partners who are in regular touch with each other and share the information on a regular basis as a single entity. They can understand the needs of the end customer better and this enables them to become responsive towards market changes quickly [Stein and Sweat, 1998]. This responsiveness brings performance improvement in the organization. Thus we propose the following hypothesis :

H1: There is a positive relationship between customer relationship and performance.

Information Quality

Information Quality (IQ) is a multidimensional phenomenon discussed by various researchers to identify and classify its dimensions. Information is very important in the evaluation of supply chain performance and it plays an important role in the supply chain [Gunasekaran et al., 2008]. Information can be a source of competitive advantage if shared in a controlled way which resulted in the form of an integrated and coordinated supply chain [Daugherty et al. 2006, Wang et al., 2008]. On the other hand delayed, misleading or incomplete information can

create serious problems in the supply chain [Power, 2005]. Information quality is an important factor in bullwhip effect formation and from the previous study, it was confirmed that better information quality reduces it [Chatfield et al., 2004]. The reduction of the bullwhip effect resulted in supply chain cost savings and performance improvement. In a previous study, it was found that when firms align supply chain practice with the level of their information quality, it brings improvement in business performance [Zhou et al., 2014].

Zailani and Rajagopal [2006], confirmed in their study that information quality is positively related to supply chain performance. Marinagi et al. [2015], provide empirical evidence that information quality has a positive impact on supply chain performance if mediated by information sharing. The use of timely and relevant information by all the supply chain partners can provide an edge over its competitor [Tompkins and Ang, 1999]. Thus we propose the following hypothesis as:

H2: There is a significant & positive relationship between information quality and performance.

Information technology

Information Technology got recognition in the present era at a wider level and considered an important factor because of its contribution to improving the performance of both the individual firm and the supply chain as a whole. There is a large number of studies available in the literature about the impact of information technology on firms performance [Bharadwaj, 2000; Hendricks and Singhal, 2003; Dehning et al., 2007].

Information technology serves as a low-cost alternative communication platform in place of traditional face-to-face communication to ensure accurate information availability. Implementation of Information Technology in supply chain management can integrate and coordinate the flow of materials, information, and finances among suppliers, manufacturers, wholesalers, retailers, and end-users because of its potential to help in communication and collaboration along the supply chain

[Brandyberry et al., 1999]. The prime objective of information technology is to improve customer satisfaction. The customer can be satisfied through on-time delivery with accuracy, availability of the product, responsiveness, and flexibility, increase in sales, giving value to the feedback and taking a suitable measurement to improve the efficiency of operations [Korhonen et al., 1998]. It is well known fact that advanced information technology required for effective and efficient information systems, which played a key role because many important functions such as demand management, capacity, and resource management, CRM, SRM, and order process management depend on an effective flow of information [Baltacioglu et al., 2007] and improve operations of supply chain [Cho et al., 2012].

Li et al. [2009], analyzed the impact of information technology on supply chain performance and found that information technology can affect supply chain performance either directly or indirectly. It is a well-known fact that the firms which make an investment in information technology and develop distinct competencies related to their information technologies resulted in performance improvement [Ross, 2002].

Marinagi et al. [2015], examine the impact of Information Technology (IT) practices on building competitive advantage. The findings of this study confirmed that information technology practices played a key role in the establishment of a sustainable competitive advantage. Hence, we propose the following hypothesis:

H3: There is significant & positive relationship between Information Technology and performance

Operational Performance

The performance measurement of entire supply chains is an important issue because it helps in tracking and tracing of efficacy and enables to make a suitable decision with regard to the chain. However, there is hardly a single measure for firm performance. The firms in the supply chain have been come across by time-

based competition, which needs firms to be responsive as per the market changes and the customer requirements [Chen et al., 2004; Flynn et al., 2010]. In the past literature, it was considered that the short-term goal of SCM is to reduce inventory and cycle time to increase productivity while the long-term goals are to increase market share and profits [Tan et al., 1998].

Some other researchers have different views on performance measurement of the organization. The organizational performance can be measured in terms of operational efficiency and financial outcome of the firms. Operational performance is described in terms of delivery speed, the degree of capital utilization, or the quality of production outputs [González-Benito, 2007]. Aramyan et al. [2007], measured the performance in terms of efficiency, flexibility, responsiveness and food quality for agro-food supply chains. Previous studies suggested that improvements in profits, market share, and total firm revenue can be achieved only by employing the SCM practices thoroughly into the firm's daily operational processes [Chang et al., 2016; Oke & Kach, 2012]. The items used to measure SCM practices and Operational performances are given in Appendix I.

RESEARCH METHODOLOGY

To obtain a targeted sample, we randomly selected 200 Fair price shops from a list available on a government website. The names and addresses of the FPS were obtained from this list. We identified the key persons from each shop as the respondent to get our questionnaire filled. These key persons were selected because of their vast amount of knowledge on operations in FPS. All identified key respondents were directly contacted to participate in the survey and presented our research objectives and a request for them to join the survey. The study was conducted through questionnaires, using a 5-point Likert-scale from 1 = Strongly Disagree to 5 = Strongly agree. The questionnaire containing Likert-scaled items (5-point scale) has been drafted in both English and Hindi (Hindi is the vernacular spoken in the state of Madhya Pradesh in India). The questionnaire has been

translated into Hindi so that customers can understand the meaning and purpose of each question in the questionnaire and subsequently retranslated into English to enhance translation correspondence [Hui and Triandis, 1985]. The items in the questionnaire were taken from previous research to increase the validity of the study. These items are taken from the previous studies conducted by various researchers [Paulraj et al., 2008, Li et al., 2006 and Liu et al., 2016].

Total 200 questionnaires were given to MBA students to collect the data from those

fair price shops dealers who qualify the screening questions and situated in Bhopal Madhya Pradesh (India) in the month of March – April’ 2017. Finally, 87 useful questionnaires were obtained, with a response rate of 43.5%, which is considered to be satisfactory for this type of empirical research. The sample size is justifiable for the study because it depends on the maximum number of arrows pointing towards a latent variable as specified in the structural equation model [Marcoulides & Saunders, 2006]. Table 1 presents the demographic information for the sample.

Table 1. Demographic profile of respondents

	Age Group				Education background			Gender	
	18-25	26-35	36-45	above 45	Graduate	Below Graduate	Above Graduate	Male	Female
No of respondents	10	15	42	20	35	27	25	87	0

DATA ANALYSES AND RESULTS

PLS-structural equation modelling (SEM) is an important tool for survey-based research. It has wide acceptance and uses in the field of operations management [Peng, and Lai, 2012]. PLS is variance-based SEM and useful because it reduces convergence problems and factor indeterminacy [Henseler, 2010]. Furthermore, PLS required small sample size, does not require normally distributed data and provides more conservative estimates of the individual path coefficients than covariance-based techniques [Hair et al., 2011; Henseler et al., 2009]. PLS-SEM is a combination of path analysis, regression analysis, and principle component analysis technique to evaluate theory and data simultaneously [Vinzi et al., 2010]. PLS path models comprise of two sets of linear equations: the outer model which is known as measurement model and the inner model which is known as the structural model in the literature. The inner model shows the relationships between latent variables whereas the outer model shows the relationships between a latent variable and its theoretical concepts [Ringle et al., 2010]. The evaluation of the research model according to PLS follows a two-stage process [Chin, 2010]. The

first stage is the evaluation of the measurement model by investigating the reliability and the convergent and discriminant validity of the constructs. The second stage is evaluating the structural model by testing the significance of the relationships between the model constructs.

THE MEASUREMENT MODEL

The measurement model is examined on the basis of reliability and validity of the constructs of the model [Hulland, 1999]. In the first step, we run the model and determine the factor loading for each factor. Any factor that is less than 0.5 has to be dropped, and the model has to be run again. This iteration process has to be carried out until all the factors considered in the model have loading factor of greater than /equal to 0.5 [Chin, 1998].

Table 2. Convergent Validity

Items	Loading	Average Variance Extracted (AVE)	Composite Reliability (CR)	Cronbach Alpha
CR2	0.612	0.606	0.858	0.778
CR3	0.84			
CR4	0.802			
CR5	0.837			
IT1	0.841			
IT2	0.892	0.704	0.877	0.794
IT3	0.78			
IQ2	0.884			
IQ3	0.73	0.694	0.871	0.777
IQ4	0.877			
OP1	0.849			
OP2	0.701			
OP3	0.914	0.648	0.899	0.856
OP4	0.553			
OP5	0.942			

Once, all of these factors have a factor loading >0.5, this measurement model is considered reliable. For this study, two iterations were carried out to reach the threshold reliability for the item. A total of two items were deleted (each item for each iteration) and this left out 15 out of 17 items that are reliable. Convergent validity is the measure of the internal consistency. The measurements of Convergent validity ensure that the items assumed to measure each latent variable measures them and not measuring another latent variable [Fornell & Larcker, 1981]. The Convergent validity is determined by Cronbach's alpha, Composite reliability (CR) and Average Variance Extracted (AVE) as suggested by [Aibinu et al., 2011]. Composite Reliability (CR) measure is used to check how well a construct is measured by its assigned indicators while Cronbach's Alpha is the coefficient of reliability, measures how well a set of items measures a single one-dimensional latent construct. The threshold values for Composite Reliability (CR) and Cronbach's Alpha is considered .70 [Hair et al., 2011; Henseler et al., 2009]. From the table 2, it is clear that all the constructs are above these threshold values and thus established the construct reliability. A commonly applied criterion of convergent validity is the AVE, as proposed by Fornell and Larcker [1981]. Average Variance Extracted (AVE) shows the internal consistency of the construct by measuring the amount of variance that a latent variable captures. Hair et al., [2011] stated that AVE should be higher than 0.5 and it is clear from the table 2, that all the constructs are

above these threshold values. Thus, demonstrates sufficient convergent validity.

Discriminant validity is examined by the use of AVE as suggested by Fornell and Larcker [1981]. Discriminant validity indicates that how well a given construct is different from other constructs [Hulland, 1999]. For adequate discriminant validity, the AVE shared on itself should be higher than variance shared with other constructs [Chin, 1998]. The table 3, shows sufficient discriminant validity.

Table 3. Discriminant Validity

Constructs	CR	IQ	IT	OP
CR	0.778			
IQ	0.332	0.833		
IT	0.62	0.449	0.839	
OP	0.53	0.56	0.604	0.805

STRUCTURAL MODEL EVALUATION

The structural model shows the relationship between exogenous and endogenous latent variables in respect of variance accounted [Hulland, 1999]. The explanatory power of the model depends on the two values namely squared multiple correlations (R²) and path coefficient (β) values. Where R² shows the percentage of variance, an endogenous depicts in the model, whilst the path coefficients show the strengths of relationships between constructs [Chin, 1998]. R² of endogenous is

considered as substantial = 0.26, moderate = 0.13 and weak = 0.02 [Chin, 1998]. In this study, R² value for the structural model is 0.499 which shows that the model has the substantial power of explaining the impact of all constructs on performance.

For path coefficient, judgement β value of all structural paths is compared. The construct having highest β value indicates that effect of the construct is most significant and lowest value shows the lowest effect of construct on the endogenous latent variable. From Table 4, it shows that Information Quality (IQ) has the highest impact on performance with the value

of path coefficient, $\beta = .346$. The customer relationship (CR) is the least contributing factor towards performance and depicted in figure 2.

The goodness of Fit (GoF) was calculated to see the overall model fitness for prediction. From the past research, it was confirmed that the GoF for a model with large effect sizes should be greater than or equal 0.36 [Wetzels, et al., 2009]. GoF is SQRT (average of endogenous constructs AVE multiplied by average R-Square). The GoF score for the research model was 0.577, showing that the model had a good fit.

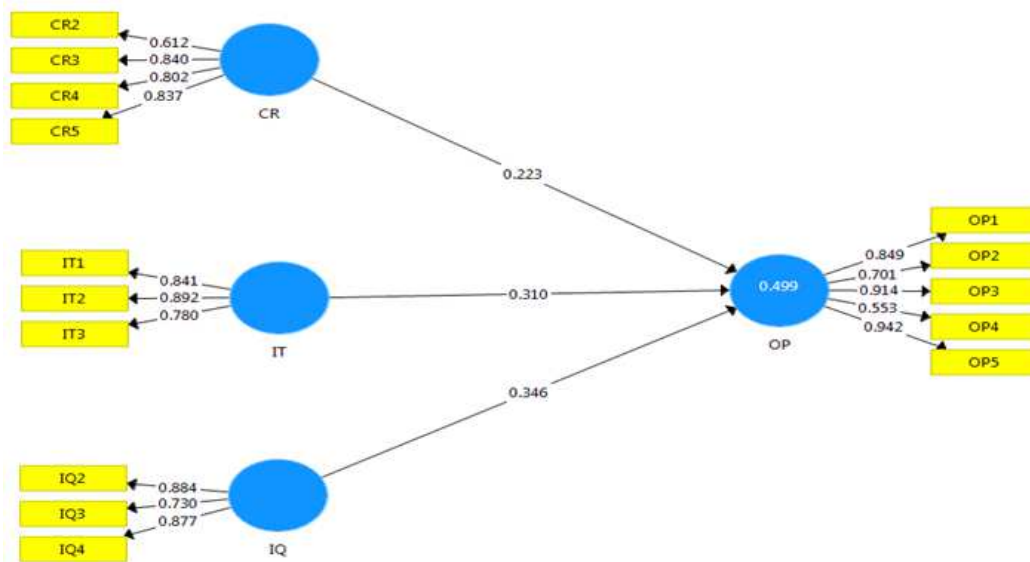


Fig. 2. Path Model

HYPOTHESES TESTING

For hypotheses testing, we see the significance of the relationships among the latent variables using the associated t-statistics obtained from PLS bootstrapping. Table 4 presents the tested hypotheses and the t values observed with the level of significance achieved from the bootstrap test. Thus from the table 4, it is clear that all the hypotheses are satisfied which verified our proposed conceptual model. The final model is shown in figure 3.

Table 4. Significance levels 0:05 (2-tailed test)

Hypotheses	Path coefficient (β)	t-value	Results
H1: Customer relationship has positive impact on operational performance	0.223	2.446	Accepted
H2: Information Quality has positive impact on operational performance	0.346	3.699	Accepted
H3: Information Technology has positive impact on operational performance	0.31	3.575	Accepted

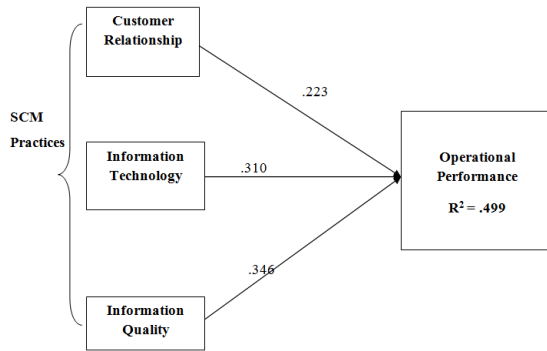


Fig. 3. Path coefficients and R² of the endogenous variable, P < 0.05

DISCUSSION

The study presented in this paper has examined the impact of SCM practices on operational performance. The conceptual model was tested to evaluate the fair price shop performance. We will discuss the findings related to each hypothesis in turn.

We had hypothesized that customer relationship as SCM practice would be positively associated with the operational performance. The findings of our study are in conformance with other research studies' results regarding the customer relationship and performance of the organizations. These findings are well supported by the previous literature. For example, Banerjee and Mishra [2017], found that customer relationship as supply chain practice strongly related to firm performance. Since Fair price shops are running for the distribution of food commodity to the needy people and good relationship with customers will bring good image for the fair price shop. Improved distribution performance is the key element of supply chain success which brings customer satisfaction [Stewart, 1995].

Again, we had hypothesized that IT as SCM practice would be positively associated with the operational performance. The results of this study show that Information technology is having a positive impact on operational performance. For example, Li et al. [2009], analyzed the impact of information technology on supply chain performance and found that information technology can affect supply chain performance either directly or indirectly. This

implies that Information technology reduces the uncertainty by providing the required information timely about the availability of the products, shipment status, and inventory levels which resulted in enhancement of efficiency in operations.

Furthermore, we proposed that IQ as SCM practice would be positively associated with the operational performance which again in conformance with past results in different studies. For example, Zailani and Rajagopal [2006], confirmed in their study that information quality is positively related to supply chain performance.

All the above discussion explains the significant relationship between SCM practices and operational performance of the fair price shops.

CONCLUSIONS

Our study is of interest from both theoretical and practical perspectives. The proposed conceptual model was derived from previous studies and backed with empirical validation. In this globalized world, employing the SCM practices not only provide an edge over its competitor but it is essential to improve the operational performance of the organization. A review of the relevant literature shows that the SCM practices help in financial performance achievement but still lacks sufficient empirical evidence regarding the impact of SCM practices on operational performance. A structural equation model was developed based on an extensive literature review. Based on survey data obtained from 87 FPS owners who are having wide experience in operating these shops, our analysis provides evidence that SCM practices (customer relationship, information technology, and Information Quality) positively impact the performance. From the findings, it is clear that information quality construct has the highest impact on performance while customer relationship (CR) construct has the least impact on performance. The contribution of this study is that it is perhaps the first empirical study examined the performance of fair price shops in India.

LIMITATIONS AND FUTURE RESEARCH SCOPE

The limitations of this study may serve as ideas for future research. The biggest limitation of this study is that only three SCM practices were taken to examine the performance of fair price shops. Second many of our findings may be limited to the setting of our research, the relatively small sample size covering a small part of the country. The results may not be generalized. Thus, future research may need to include an even bigger sample size. Moreover, the analyses performed on only three SCM practices and the scope of our study is limited to CR, IT and IQ practices only. Future research could embed this into a broader model that also includes other supply chain management practices. Despite these limitations, this study will help the researchers and practitioners to more fully understand the positive impact of SCM practices on operational performance.

REFERENCES

- Aibinu A.A., Ling F.Y.Y., Ofori G., 2011. Structural equation modelling of organizational justice and cooperative behaviour in the construction project claims process: contractors' perspectives. *Construction Management and Economics*, 29(5), 463-481. <http://dx.doi.org/10.1080/01446193.2011.564195>
- Aramyan L.H., Oude Lansink A.G., Van Der Vorst J.G., Van Kooten O., 2007. Performance measurement in agri-food supply chains: a case study. *Supply Chain Management: An International Journal*, 12(4), 304-315. <https://doi.org/10.1108/13598540710759826>
- Banerjee M., Mishra M., 2017. Retail supply chain management practices in India: A business intelligence perspective. *Journal of Retailing and Consumer Services*, 34, 248-259. <https://doi.org/10.1016/j.jretconser.2015.09.009>
- Bharadwaj A.S., 2000. A resource-based perspective on information technology capability and firm performance: an empirical investigation. *MIS quarterly*, 169-196. <http://dx.doi.org/10.2307/3250983>
- Brandyberry A., Rai A., White G.P., 1999. Intermediate performance impacts of advanced manufacturing technology systems: An empirical investigation. *Decision Sciences* 30 (4), 993-1020. <http://dx.doi.org/10.1111/j.1540-5915.1999.tb00916.x>
- Baltacioglu T., Ada E., Kaplan M.D., Yurt And O., Cem Kaplan Y., 2007. A new framework for service supply chains. *The Service Industries Journal*, 27(2), 105-124. <http://dx.doi.org/10.1080/02642060601122629>
- Chen I.J., Paulraj A., Lado A.A., 2004. Strategic purchasing, supply management, and firm performance. *Journal of operations management*, 22(5), 505-523. <https://doi.org/10.1016/j.jom.2004.06.002>
- Cho D.W., Lee Y.H., Ahn S.H., Hwang M.K., 2012. A framework for measuring the performance of service supply chain management. *Computers & Industrial Engineering*, 62, 801-818. <https://doi.org/10.1016/j.cie.2011.11.014>
- Chin W.W. 1998. The partial least squares approach to structural equation modelling. In G. A. Marcoulides (Ed.), *Modern methods for business research*, 295-336. Mahwah, NJ' Lawrence Erlbaum Associate.
- Chang W., Ellinger A.E., Kim K.K., Franke G.R., 2016. Supply chain integration and firm financial performance: A meta-analysis of positional advantage mediation and moderating factors. *European Management Journal*, 34(3), 282-295. <https://doi.org/10.1016/j.emj.2015.11.008>
- Chin W.W., 2010. How to write up and report PLS analyses. In *Handbook of partial least squares*, 655-690. Springer Berlin Heidelberg.
- Closs D.J., Jacobs M.A., Swink M., Webb G.S., 2008. Toward a theory of competencies for the management of product complexity: six case studies. *Journal of*

- Operations Management, 26(5), 590-610. <https://doi.org/10.1016/j.jom.2007.10.003>
- Childerhouse P., Towill D.R., 2003. Simplified material flow holds the key to supply chain integration. *Omega*, 31(1), 17-27. [https://doi.org/10.1016/S0305-0483\(02\)00062-2](https://doi.org/10.1016/S0305-0483(02)00062-2)
- Chatfield D.C., Kim J.G., Harrison T.P., Hayya J.C., 2004. The bullwhip effect—impact of stochastic lead time, information quality, and information sharing: a simulation study. *Production and Operations Management*, 13(4), 340-353. <http://dx.doi.org/10.1111/j.1937-5956.2004.tb00222.x>
- Dehning B., Richardson V.J., Zmud R.W., 2007. The financial performance effects of IT-based supply chain management systems in manufacturing firms. *Journal of Operations Management*, 25(4), 806-824. <https://doi.org/10.1016/j.jom.2006.09.001>
- Daugherty P.J., Richey R.G., Roath A.S., Min S., Chen H., Arndt A.D., Genchev S.E., 2006. Is collaboration paying off for firms?. *Business Horizons*, 49(1), 61-70. <https://doi.org/10.1016/j.bushor.2005.06.002>
- Fynes B., De Burca S., Mangan J., 2008. The effect of relationship characteristics on relationship quality and performance. *International Journal of Production Economics*, 111(1), 56-69. <https://doi.org/10.1016/j.ijpe.2006.11.019>
- Flynn B.B., Huo B., Zhao X., 2010. The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of operations management*, 28(1), 58-71. <https://doi.org/10.1016/j.jom.2009.06.001>
- Fornell C., Larcker D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39-50. <http://dx.doi.org/10.2307/3151312>
- Green Jr K.W., McGaughey R., Casey K.M., 2006. Does supply chain management strategy mediate the association between market orientation and organizational performance?. *Supply Chain Management: An International Journal*, 11(5), 407-414. <https://doi.org/10.1108/13598540610682426>
- Gunasekaran A., Kobu B., 2007. Performance measures and metrics in logistics and supply chain management: a review of recent literature (1995–2004) for research and applications. *International journal of production research*, 45(12), 2819-2840. <http://dx.doi.org/10.1080/00207540600806513>
- Gunasekaran A., Lai K.H., Cheng T.E., 2008. Responsive supply chain: a competitive strategy in a networked economy. *Omega*, 36(4), 549-564. <https://doi.org/10.1016/j.omega.2006.12.002>
- Gonzalez-Benito J., 2007. A theory of purchasing's contribution to business performance. *Journal of Operations Management*, 25(4), 901-917. <https://doi.org/10.1016/j.jom.2007.02.001>
- Hui C.H., Triandis H.C., 1985. Measurement in cross-cultural psychology: A review and comparison of strategies. *Journal of cross-cultural psychology*, 16(2), 131-152. <https://doi.org/10.1177/0022002185016002001>
- Hendricks K.B., Singhal V.R., 2003. The effect of supply chain glitches on shareholder value. *Journal of Operations Management* 21, 501–522. <https://doi.org/10.1016/j.jom.2003.02.003>
- Henseler J., Ringle C.M., Sinkovics R.R., 2009. The use of partial least squares path modelling in international marketing. *Advances in international marketing*, 20, 277-319.
- Henseler J., 2010. On the convergence of the partial least squares path modelling algorithm. *Computational statistics*, 25(1), 107-120. <http://dx.doi.org/10.1007/s00180-009-0164-x>
- Hamister J.W., 2012. Supply chain management practices in small retailers. *International Journal of Retail & Distribution Management*, 40(6), 427-450. <https://doi.org/10.1108/09590551211230250>

- Hulland J., 1999. Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, 20(2), 195– 204.
- Hair J.F., Ringle C.M., Sarstedt M., 2011. PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, 19(2), 139-152.
<http://dx.doi.org/10.2753/MTP1069-6679190202>
- Jayachandran S., Sharma S., Kaufman P., Raman P., 2005. The role of relational information processes and technology use in customer relationship management. *Journal of marketing*, 69(4), 177-192.
<https://doi.org/10.1509/jmkg.2005.69.4.177>
- Kutsikos K., Sakas D., 2014. A framework for enabling service configuration decisions: the case of IT outsourcing providers. *Procedia-Social and Behavioral Sciences*, 148, 604-610.
<https://doi.org/10.1016/j.sbspro.2014.07.086>
- Korhonen P., Huttunen K., Eloranta E., 1998. Demand chain management in a global enterprise-information management view. *Production Planning & Control*, 9(6), 526-531.
<http://dx.doi.org/10.1080/095372898233777>
- Lambert D.M., Cooper M.C., Pagh J.D., 1998. Supply chain management: implementation issues and research opportunities. *The International Journal of Logistics Management* 9 (2), 1–19.
<https://doi.org/10.1108/09574099810805807>
- Li G., Yang H., Sun L., Sohal A.S., 2009. The impact of IT implementation on supply chain integration and performance. *International Journal of Production Economics*, 120(1), 125-138.
<https://doi.org/10.1016/j.ijpe.2008.07.017>
- Li S., Ragu-Nathan B., Ragu-Nathan T. S., Rao S.S., 2006. The impact of supply chain management practices on competitive advantage and organizational performance, *Omega* 34, 107 – 124.
<https://doi.org/10.1016/j.omega.2004.08.002>
- Liu H., Wei S., Ke W., Wei K.K., Hua Z., 2016. The configuration between supply chain integration and information technology competency: A resource orchestration perspective, *Journal of Operations Management*, 44, 13-29.
<https://doi.org/10.1016/j.jom.2016.03.009>
- Marinagi C., Trivellas P., Reklitis P., 2015. Information quality and supply chain performance: The mediating role of information sharing. *Procedia-Social and Behavioral Sciences*, 175, 473-479.
<https://doi.org/10.1016/j.sbspro.2015.01.1225>
- McCorriston S., MacLaren D., 2016. Parastatals as instruments of government policy: The Food Corporation of India. *Food Policy*, 65, 53-62.
<https://doi.org/10.1016/j.foodpol.2016.10.05>
- Mentzer, J. T., Min, S., & Zacharia, Z. G. (2000). The nature of inter firm partnering in supply chain management. *Journal of Retailing*, 76(4), 549-568.
[https://doi.org/10.1016/S0022-4359\(00\)00040-3](https://doi.org/10.1016/S0022-4359(00)00040-3)
- Marcoulides G.A., Saunders C., 2006. Editor's Comments – PLS: A Silver Bullet? *MIS Quarterly*, 30(2), iii-ix.
- Oke A., Kach A., 2012. Linking sourcing and collaborative strategies to financial performance: The role of operational innovation. *Journal of Purchasing and Supply Management*, 18(1), 46-59.
<https://doi.org/10.1016/j.pursup.2012.01.001>
- Paulraj A., Lado A.A., Chen I.J., 2008. Inter-organizational communication as a relational competency: Antecedents and performance outcomes in collaborative buyer–supplier relationships, *Journal of Operations Management* 26, 45–64.
<https://doi.org/10.1016/j.jom.2007.04.001>
- Peng D.X., Lai F., 2012. Using partial least squares in operations management research: A practical guideline and summary of past research. *Journal of Operations Management*, 30(6), 467-480.
<https://doi.org/10.1016/j.jom.2012.06.002>

- Power D., 2005. Supply chain management integration and implementation: a literature review. *Supply chain management: an International journal*, 10(4), 252-263. <https://doi.org/10.1108/13598540510612721>
- Randall W.S., Gibson B.J., Clifford Defee C., Williams B.D., 2011. Retail supply chain management: key priorities and practices. *The International Journal of Logistics Management*, 22(3), 390-402. <https://doi.org/10.1108/09574091111181381>
- Ross A., 2002. A multi-dimensional empirical exploration of technology investment, coordination, and firm performance. *International Journal of Physical Distribution and Logistics Management* 32 (7), 591-609. <https://doi.org/10.1108/09600030210442603>
- Ringle C.M., Sarstedt M., Mooi E.A., 2010. Response-based segmentation using finite mixture partial least squares. In *Data Mining* (pp. 19-49). Springer US.
- Stewart G., 1995. Supply chain performance benchmarking study reveals keys to supply chain excellence. *Logistics Information Management*, 8(2), 38-44. <https://doi.org/10.1108/09576059510085000>
- Stein T., Sweat J., 1998. Killer supply chains. *Information week*, 708(9), 36-46.
- Scott C., Westbrook R., 1991. New strategic tools for supply chain management. *International Journal of Physical Distribution & Logistics Management*, 21(1), 23-33. <https://doi.org/10.1108/09600039110002225>
- Singh R., Sandhu H.S., Metri B.A., Kaur R., 2010. Relating organised retail supply chain management practices, competitive advantage and organisational performance. *Vision*, 14(3), 173-190. <https://doi.org/10.1177/097226291001400303>
- Sambasivan M., Siew-Phaik L., Mohamed Z.A., Leong Y.C., 2013. Factors influencing strategic alliance outcomes in a manufacturing supply chain: role of alliance motives, interdependence, asset specificity and relational capital. *International Journal of Production Economics*, 141(1), 339-351. <https://doi.org/10.1016/j.ijpe.2012.08.016>
- Srivastava S.K., 2006. Logistics and supply chain practices in India. *Vision: The Journal of Business Perspective*, 10(3), 69-79. <https://doi.org/10.1177/097226290601000307>
- Tompkins J., Ang D., 1999. What are your greatest challenges related to supply chain performance measurement?, *IIE Solutions*, 31, 6, 66.
- Tan K.C., Kannan V.R., Handfield R.B., 1998. Supply chain management: supplier performance and firm performance. *Journal of Supply Chain Management*, 34(3), 2-9.
- Tan K.C., Kannan V.R., Handfield R.B., Ghosh S., 1999. Supply chain management: an empirical study of its impact on performance. *International journal of operations & production Management*, 19(10), 1034-1052. <https://doi.org/10.1108/01443579910287064>
- Tanriverdi H., Venkatraman N., 2005. Knowledge relatedness and the performance of multibusiness firms. *Strategic Management Journal*, 26(2), 97-119. <http://dx.doi.org/10.1002/smj.435>
- Vinzi V.E., Trinchera L., Amato S., 2010. PLS Path Modeling: From Foundations to Recent Developments and Open Issues for Model Assessment and Improvement. In V. Esposito Vinzi et al. (eds.), *Handbook of Partial Least Squares*, Springer Handbooks of Computational Statistics, 47-82.
- Wang M., Liu J., Wang H., Cheung W.K., Xie X., 2008. On-demand e-supply chain integration: A multi-agent constraint-based approach. *Expert Systems with applications*, 34(4), 2683-2692. <https://doi.org/10.1016/j.eswa.2007.05.041>
- Wetzels M., Odekerken-Schroder C., Van Oppen, C., 2009. Using PLS path modelling for assessing hierarchical construct models: guidelines and empirical

illustration. *MIS Q.* 33 (1), 177–195. <https://doi.org/10.2307/20650284>.

Zhou H., Shou Y., Zhai X., Li L., Wood C., Wu X., 2014. Supply chain practice and information quality: A supply chain strategy study. *International Journal of Production Economics*, 147, 624-633. <https://doi.org/10.1016/j.ijpe.2013.08.025>

Zailani S., Rajagopal P., 2006. The effects of Information Quality on Supply Chain Performance: New Evidence from Malaysia. In Latif AlHakim (Ed.), *Information Quality Management: Theory and Applications*, Chapter XII, 275- 29, IGI Global, ISBN:1599040247. <http://dx.doi.org/10.4018/978-1-59904-024-0.ch012>

PRAKTYKA ZARZĄDZANIA ŁAŃCUCHEM DOSTAW I DZIAŁANIA OPERACYJNE SKLEPÓW Z FAIR PRICE W INDIACH: STUDIUM PRZYPADKU

STRESZCZENIE. Wstęp: W obecnie istniejącym środowisku biznesowym, należy mówić raczej o rywalizacji nie między poszczególnymi organizacjami a sieciami organizacji. Indyjski publiczny system dystrybucji jest jednym z największych systemów dostaw i dystrybucji żywności realizowany poprzez sieć sklepów tzw. fair price (FPS). Pomimo tego faktu stosunkowo mało jest badań naukowych dotyczących tego typu sieci.

Celem pracy jest określenie zależności pomiędzy różnymi metodami zarządzania łańcuchem dostaw i działaniami operacyjnymi tego typu sklepów w Indiach. Autorzy zaproponowali model teoretyczny oraz test empiryczny. Celem pracy jest poszerzenie wiedzy strukturalnej na temat zarządzania łańcuchem dostaw.

Metody: Została wybrana próba losowa 200 sklepów typu fair price z listy dostępnej na stronie rządowej. Następnie zidentyfikowano osobę kluczową z każdego sklepu, jako ankietera uczestniczącego w badaniu. Dane zostały zebrane poprzez specjalnie stworzony kwestionariusz. Wywiady zostały przeprowadzone przez studentów MBA z wybranymi uprzednio osobami. Były one zbierane w Bhopal Madhya Pradesh w okresie marzec-kwiecień 2017. W rezultacie otrzymano 87 kompletnych kwestionariuszy (współczynnik udziału 43,5%). Model SEM strukturalnego równania PLS został użyty do testowania modelu teoretycznego i hipotez.

Wyniki: Badania wykazały, że trzy wymiary metod zarządzania łańcuchem dostaw mają istotną i pozytywną zależność z działalnością operacyjną. Pokazały empirycznie jak zmiany wpływają na działalność operacyjną sklepów fair price. Wskazują, że metody zarządzania łańcuchem dostaw pozytywnie i istotnie związane są z działalnością sklepów typu fair price.

Wnioski: Praca wskazuje na istotny wpływ metod zarządzania łańcuchem dostaw na bieżącą działalność sklepów typu fair price oraz dowodzi pozytywny wpływ tych praktyk prawidłowo wdrożonych na uzyskanie wartości dodanej. Przeprowadzone badania uzupełniają lukę w badaniach nad wpływem metod zarządzania łańcuchem dostaw na działalność sklepów typu fair price w Indiach. Największym ograniczeniem tego badania była próba, na podstawie której uzyskano wyniki. W związku z tym nie jest możliwe uogólnienie tych wyników. Badania tego typu należałoby kontynuować w szerszym zakresie.

Słowa kluczowe: praktyka zarządzania łańcuchem dostaw, sklepy typu fair price, PLS, modelowanie struktury, publiczny system dystrybucji.

PRAXIS DES LIEFERKETTEN-MANAGEMENTS UND OPERATIVE AKTIVITÄTEN DER FAIR PRICE-GESCHÄFTE IN INDIEN: EIN STUDIENFALL

ZUSAMMENFASSUNG. Einleitung: Im gegenwärtig bestehenden Business-Umfeld muss man eher von einem Wettbewerb zwischen Netzwerk-Organisationen, und nicht zwischen den einzelnen Organisationen sprechen. Das indische öffentliche Vertriebssystem gilt als eines der größten Lieferungs- und Distributionssysteme von Nahrungsmitteln, die über das Netz von Fair Price-Geschäften (FPS) vertrieben werden. Ungeachtet dessen gibt es relativ wenig wissenschaftliche Forschungen, die eine solche Art von Handelsnetzen anbetreffen. Das Ziel der Arbeit ist es, die Abhängigkeiten zwischen unterschiedlichen Methoden des Lieferketten-Managements und operativen Aktivitäten dieser Art Geschäfte in Indien zu ermitteln. Die Autoren haben ein theoretisches Modell und einen empirischen Test vorgeschlagen. Das Ziel ihres Vorhabens ist es, das strukturelle Wissen über das Management von Lieferketten zu verbreitern.

Methoden: Es wurde eine Losgröße von 200 Fair Price-Geschäften von einer auf der Regierungs-Webseite hinterlegten Auflistung ausgewählt. Demzufolge wurde eine Schlüsselperson in jedem Geschäft als ein an der Umfrage beteiligter Interviewer identifiziert. Die Angaben wurden in einem extra dafür verfassten Umfragebogen zusammengestellt. Die Interviews wurden mit der eingangs ausgewählten Teilnehmern von MBA-Studenten durchgeführt. Sie wurden in Bhopal Madhya Pradesh im Zeitraum März-April 2017 gesammelt. Im Ergebnis wurden 87 vollständig ausgefüllte Umfragebögen gewonnen (der Teilnahme-Koeffizient - 43,5%). Zum Durchtesten des theoretischen Modells und der betreffenden Hypothesen wurde das SEM-Modell der strukturellen PLS-Gleichung in Anspruch genommen.

Ergebnisse: Die Forschungen ergaben, dass drei Dimensionen der Methoden des Lieferketten-Managements eine relevante und positive Abhängigkeit mit der operativen Betätigung der Geschäfte aufweisen. Sie zeigten also empirisch, wie gewisse Veränderungen die operative Tätigkeit der Fair Price-Geschäfte beeinflussen. Sie weisen darauf hin, dass die Methoden des Lieferketten-Managements im relevanten und positiven Ausmaße mit der Betätigung der Fair Price-Geschäfte verbunden sind.

Fazit: Der Beitrag weist ferner auf den bedeutenden Einfluss der Methoden des Lieferketten-Managements auf die laufende Tätigkeit der Fair Price-Geschäfte hin und bezeugt den positiven Einfluss dieser richtig eingeführten Praktika auf die Erzielung der Wertschöpfung. Die durchgeführten Forschungen erfüllen die Erkenntnislücke bezüglich des Einflusses der Methoden des Lieferketten-Managements auf die Betätigung der Fair Price-Geschäfte in Indien. Die größte Einschränkung dieses Forschungsvorhabens stellte die Losgröße, anhand welcher die Ergebnisse erzielt wurden, dar. Im Zusammenhang damit ist die Verallgemeinerung der betreffenden Ergebnisse nicht möglich. Diesbezügliche Forschungen sollten in einem breiteren Ausmaße fortgesetzt werden.

Codewörter: Praxis des Lieferketten-Managements, Fair Price-Geschäfte, PLS-Gleichung, Modellierung der Struktur, öffentliches Vertriebssystem.

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