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# **Investigating Relational Dynamics, Innovation and Business Performance in SCM**

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Vipul Chalotra & Rachita Sambyal (2023). Investigating Relational Dynamics, Innovation and Business Performance in SCM. *Journal of Development Economics and Finance*, Vol. 4, No. 2, pp. 309-323. https://DOI: 10.47509/JDEF.2023.v04i02.02 Abstract: To improve value delivery to consumers by cost reduction and quality -service improvement ,firms are refocusing on their distribution networks. The present study has synthesised and investigated the inter and intra relationship between/among channel partners, moderating role of innovation between channel partners & business performance and constraints in supply chain integration. A list of 44 functional SSIs in district Udhampur were obtained from Directorate of Industries & Commerce (DIC), Udhampur of UT J&K. The sampling technique used to generate responses from 525 respondents was snowball/referral. Effective response was received from 240 respondents sub-divided into manufacturers (44), wholesalers (74) and retailers (122), representing response rate of 46 %. Data were analysed using One way ANOVA, Hayes PROCESS macro and descriptive statistics. Output from one way ANOVA shows that manufacturer, wholesaler and retailers differ with regard to product planning, order processing, nature of discounts, return of defective goods, procurement of raw material, price stabilization , inventory management, control over cost of production, production schedule, nature of goods etc. Innovation significantly impact the relationship between channel partners and business performance. Several constraints ranging from technology, information sharing, leadership etc. were identified in achieving SCI.

Keywords: SCI, Moderation, Relational dynamics

# 1. Introduction

Globalisation and sustainability has impelled businesses to refocus on distribution networks uninterruptly, cost reduction, quality & service improvement in inter

-connected and inter dependent set of intermediaries & markets. Channel intermediaries are no longer considered as separate entities but integrated within procurement-production-distribution networks (Mohanty and Deshmukh, 2005). Even supply chain has become web of relationship by including customers, their business associates and end users for attaining competitive advantage((Christopher and Juttner, 2000 & Min Soonhong & Mentzer, 2001). Cox (1999) defines SCM as adoption of specific capabilities which enhances firm's value delivery to customers, adoption of just-in-time system, minimize waste, cooperation & coordination with all suppliers & stakeholders in the superior value creation. Furthermore, SCM is considered as an integration of materials and information flows among customers, manufacturers and suppliers (Samoranayake, 2005) and advantage flows in the form of fewer inventories, shorter cash coversion time, shorter logistics chain, less material purchasing expenditure, improved efficiency and prompt customer responsiveness (Lammus & Vokurka, 1999). A typical supply chain management comprises of inventory management, information sharing & technology, transportation management, warehousing management, quality management, customers satisfaction & integration through trust, commitment, shared vision, communication, relationship bonds and dependence (Narasimhan & Nair, 2005 and Zineldin & Jonsson, 2000). To sustain in digital economy, organisations are securing collaboration among ERP,SCM systems, Customer Relationship Management (CRM), marketing management ,e-supply, as well as making them available over the Web to foster integration across the entire network. The focus of SCI is to provide promptly product and services at low cost (Flynn et al., 2010), service quality (Lee and Padmanabhan, 1997), enhance business performance (Zhao et al., 2013). Researchers have classified SCM challenges as business microenvironment, business macro environment and technological challenges. These include high transaction cost, inflexible management, absence of strategic planning, poor customer order management, operational inflexibility, interrupted procurement management, differential culture and change ,limited data and information exchange etc.

Prior researches have examined performance considerations from few aspects, ignoring customers and other stakeholders, who are vital component in the SCI. Innovation as a moderator in relation among/ between channel partners and business performance is missing. There are also certain challenges unexplained from the perspective channel partners. The present study has synthesised and investigated

the inter and intra relationship between/among channel partners and moderating role of innovation between channel partners and business performance in supply chain integration.

# II. Conceptual Framework of Relationl Dynamics

Dyer and Singh (1998) advocated relational theory to connotes idiosyncratic interorganisational linkages that result in superior market performance. Three types of relational specific investments are observed in practice : site specificity, physical asset specificity and human asset specificity (Williamson,1985). These cannot be created in isolation but with cooperation with channel partners and results in reduced inventory & transportation costs, improvement in product quality, product differentiation etc. The relational capability channel partners not only results in inter firm competition but `winning' strategy at market place (Gattorna, 2009).These relational dynamics are strengthened by trust, loyalty, commitment and progressive attitude (Chandra and Kumar, 2000).

# **Channel partners**

The distributors/partners/members/intermediaries involved in supply chain management are suppliers, manufacturers, wholesalers and retailers. Suppliers' or 'vendors' are partners that provide goods or services to individuals or companies which subsequently sell them to customers. The suppliers have clear quality policy and cater to the requirements of manufacturers so that supply can be customised to their customers (Christopher and Peck, 2003). Manufacturers convert raw material into finished goods. These goods or services are transported to wholesalers'/retailers or directly to consumers. Manufacturers stock (MTS), make to order (MTO) and make to assemble (MTA). Product configuration originate from manufacturers and responsible for product failure or success (Heide and Stump, 1995). Distributors (or wholesalers) provide producer's goods or services to a wider geographical area in an appropriate quantity and quality for resale to retailers. The functions of a wholesaler varies from assembling, product assortments, grading, packing and warehousing .They also maintain sufficient inventory, provide discounts ,credit & prompt supplies needed for developing healthy business relations. Retailers supplies products to customers thereby serving as an important marketing channel for goods from producers. They provide value in the form of consumer utilities by creating a place, time and possession utilities. Through right placement, banners,

advertisements, offers and other strategies ,they assist manufacturers to control inventory levels, product quality, expenses, and timing.

## Innovation

Innovation is introducing something new ranging from products, services and processes through incremental, disruptive, architectural and radical methods. Apart from these, innovation may include change in organization, sales/new marketing channels, network innovation to delight and engage customers. Innovation typically requires experimentation, risk taking & creativity and require creation of learning culture in the organization.

# **Business performance**

Earlier researchers have measured business performance on financial and non financial metrics (Cron & Sobol, 1983; Dixon et al., 1990; Eccles, 1991; Kaplan & Norton, 1992 and Maskell, 1991). These include profitability, annual returns on sales, average market share, profit margin, profit growth rate, customer satisfaction, customer retention and customer service satisfaction. Further, business performance is seen as improved operational performance in supply chain such cost reduction, product differentiation, enhanced customer satisfaction (Porter, 2012), market adaptation ,prompt delivery and improvement in market offerings (Chavez et al., 2016; Acar et al., 2017, Salam, 2017)

## **III. Review of Literature**

Supply chain management (SCM) integrates distribution processes involved in flow of material and finished goods to create superior value for customers. It is a collaborative strategy to enhance the business efficiency that ensure a competitive edge for their products and services.

Hassan & Abbasi (2021) synthesized and analyzed the existing published research of 293 research studies collected from 2015-2020. The context used were strategic, tactical and operational on several performance indicators like financial integration, upward & downward linkage ,strategic linkages and synchronized planning. To utilise integration techniques optimally, policy makers must use multiple types and approaches of integration available. Zaida et al.(2021) examined the impact of SCI on stakeholders of 308 top managers of Tuna Fillets SMEs Industries, Indonesia. The PLS-SEM output showed performance of channel members significantly & directly affect operational performance of the firm and create customer satisfaction. The mediator used were operational performance and customer satisfaction in SCI. Siagian et al. (2021) assessed the impact of supply chain resilience, partners flexibility and innovation system on business performance. Data were collected through 470 questionnaires from Indonesia's manufacturing companies and analysed using the partial least square (PLS) technique. The results showed that SC integration results in product improvement/ development, innovation and intense IT application. SCI affects supply chain flexibility & supply chain resilience which enables channel partners to adapt production planning, material requirement and order fulfilment. Liu & Chiu (2021) evaluated mediating role of SCI and moderating effect of SCI, digitalisation and firm performance. Data were collected from 264 Chinese employees working in the supply chain industry and analysed by PLS-SEM using the SmartPLS 3.0. The results showed positive relationship between SCI digitalization and firm performance. A significant mediating effect of internal integration was observed in the relationship between supply chain digitalization and firm performance. Khanuja and Jain (2020) concisely presented drivers and sources of SCI. The study is based on 110 articles reviewed covering drivers and sources of SCI, SCI dimensions and SCI outcome. The study found moderate growth of SCI from 2009-2011 and thereafter robust growth after 2015. 27 percent of paper reviewed were on multi-country settings analysed by statistical methods. The analysis showed the cost orientation, customer orientation and recently sharing information electronically are the motivation for SCI integration. Kim et al. (2020) assessed the impact of trust, satisfaction and commitment on logistics integration and competitiveness. The primary data was generated from 250 senior or middle managers ofin Korean manufacturing firms. The results showed that all the three variables are positively correlated with the logistics integration and performance. Further, environmental uncertainty poses significant challenges for firms and impel partners for integration. SCI integration assists in order processing, speedy material flows, cost efficiency and effectiveness in overall value stream.

- Hyp1: Relational dynamics significantly differs across channel intermediaries
- Obj<sup>1</sup>: To identify existence of any significant difference among channel intermediaries
- Hyp<sup>2</sup>: Innovative leadership significantly moderates the relationship among channel intermediaries

- Obj<sup>2</sup>: Innovative leadership style of manufacturer significantly moderates the relationship across supply chain intermediaries.
- Hyp<sup>3</sup>: Relational dynamics significantly obstructs the performance of logistic integration
- Obj<sup>3</sup>: To identify impediments in supply chain integration

# **IV. Research Methodology**

A list of 44 functional SSIs in district Udhampur was obtained from Directorate of Industries & Commerce (DIC), Udhampur of UT J&K. Sampling technique used was snowball/Referral for collecting primary data from 525 respondents. Effective response was received from 240 respondents sub-divided into manufacturers (44), wholesalers (74) and retailers (122), representing a response rate of 46 %. A 78 item questionnaire was prepared sub divided into two sections-General information and business specific information related to inventory management, information technology, trust, commitment, cooperation, transportation & warehousing, customer satisfaction, innovation and business performance. Questions relating to business specific information were based on ordinal scale (5<---->1) ranging from 'strongly disagree' (1) to 'strongly agree' (5). Items were generated from (Jiangin, et al., 2006; Barrett, 1998; Fox, 1992; Chopra & Meindl, 2003; Disney & Towill, 2002; Hardy et al., 2003; Ireland et al., 2003; Barney & Hansen, 1994; Dyer, 1996; Gulati, 1995 and Love & Gunasekaran, 1999; Hassan & Abbasi 2021; Zaida et al., 2021; Siagian et al., 2021). The secondary information was collected from books, internal reports, journals, bulletins, digest of statistics, magazines, and other documents both published and unpublished.

The raw data obtained through the aforesaid procedure was reduced into few manageable and meaningful sets of data through technique of factor analysis (Malhotra, 2004; Stewart, 1981). The varimax rotation along with the principal axis procedure of factor analysis was applied for arriving at a stable factorial design (Malhotra, 2004). For selection of factorial design, the eigen value-one criterion was used and communality values for each variable was more than one. Bartlett's test of sphericity , the KMO as a measure of sampling adequacy and cronbach Alpha were the above the threshold limits. The factors extracted were 6(Channel partners), 2(Innovation and 3(Business performance).

The profile of manufacturing units along with their number included in the survey were Poles and Transformers(5), Cement(8), Battery/Lead/Alloy(5), Steel(5), Gates/Grills/Varnish/Paint(5), Pesticides/Insecticides(3), Menthol (2), Conduit

pipes(2), Guns(2), Steel Fabricators(3), Atta/Maize/Dal mills(3) and Electronics Works(1). Majority of manufacturing functional units fall under SIDCO group and the remaining working under SICOP. 44 functional units, 36.8% (16) units had an initial investment of Rs.1 – 25 lakhs for starting the business and 34.5%(15 units) of manufacturing firms had an initial investment over Rs.1 crore. Those who started their business with Rs.25 - 50 lakhs constitute 18.4% (8 units). Three units constituting 6.9% of the total functional units were started with the initial investment of Rs.50 - 70 lakhs while those who invested within Rs.75 lakhs - I crore were two in numbers with their respective percentage of 4.6%. Majority of respondents were from the age group of 40 - 50 years (20) constituting 45.5% of the sample 9.1% fall under the age group of 20 - 30 years and 22.7% (10) respondents belongs to the age group of 30 - 40 years. Gender-wise, 100 % of SSIs were owned by male respondents. The percentage of graduate and post graduate were 40.9% & 20.5% respectively. Matriculate respondents constitute 6.8% of the total respondents. Entrepreneurs educated upto higher secondary were 29.5% (13) and those with technical qualification one. 58.8% (25) were having past working experience of 5 - 10 years and eight respondents were found to have work experience of 1-5 years. Previous work experience 2, 4, 8, 5, 25 years were for 1-5 years, 5-10 years, 10-15 years, 15-20 years, above 20 years respectively. As far as turnover per year of the small manufacturing firms is concerned, it was found that 47.6% (21) firms are having turnover between Rs.10 – 25 lakhs. Turnover of six firms lies between 25 - 50 lakhs which constituted 16.2% of the total respondents. Only one firm was having turnover of 75 lakhs (Shankar Lime Industry).

Responses were received from 74 wholesalers, 73 located in Udhampur and one from Ramnagar. The range of investment varied between Rs.1 lakh to Rs.50 lakhs., majority falling within Rs.10-30 lakhs. Qualification-wise, respondents were below matric(22), Matric(8), Higher secondary(30, graduation(13 and others(1). Age-wise distribution was 3(20-30yrs), 30-40 yrs.(30), 40-50yrs.(18), 50-60yrs. (17) and above 60yrs.(1). Work-experience wise, distribution was 22, 27, 15, 6, 3, 1 in 0-10yrs., 10-20 yrs., 20-30 yrs., 30-40yrs., 40-50yrs. and above 50 yrs.

The number of retailers contacted were 122. Qualification-wise, distribution was below matric(37), matric(29), higher secondary938), graduation(12 and other(4). Age-wise responses were 9, 48, 38, 24 and 1 in the range of 1-10 yrs., 10-20 yrs., 20-30yrs., 30-40yrs., 40-50yrs. and above 50 years respectively. Age-wise distribution was 20-30yrs(9), 30-40yrs.(48), 40-50 yrs.(38), 50-60 yrs.(24) and above 60 yrs.(1)

# V. Data Alalysis and Interpretation

# Channel dynamic among channel partners

Table 1 shows results from one way ANOVA regarding items of SCI bearing significant mean difference among channel partner. Since the number of dimensions and items were large, only those are displayed which shows significant mean difference as evident from F value and level of significance. Thus, manufacturer, wholesaler and retailers differ with regard to product planning, order processing, nature of discounts, return of defective goods, procurement of raw material, price stabilization, inventory management, control over cost of production, production schedule, nature of goods etc. These may be due to geographically dispersed manufacturing units and distant location of wholesalers and retailers

SCI dimensions	Items	Channel partners	Mean value	F-value	Level of significance
Planning	Product planning is done	Manufacturer	2.33	1.367	.044
-	much in advance	Wholeseller	2.89		
		Retailers	1.22	]	
	Orders are processed	Manufacturer	2.33	2.419	.005
Sourcing	electronically	Wholeseller	2.65	]	
		Retailers	2.21		
	Huge discount is provided	Manufacturer	2.25	2.624	.032
	by vendors	Wholeseller	1.22		
		Retailers	2.68		
	Raw material/product is	Manufacturer	2.22	.863	.000
	procured nationally	Wholeseller	2.87		
		Retailers	2.53		
Inventory	For price stabilization	Manufacturer	2.32	2.741	.000
	sufficient inventory is	Wholeseller	2.26		
		Retailers	1.21		
	Inventory management	Manufacturer	3.03	9.275	.041
	improves service quality	Wholeseller	3.00		
		Retailers	2.11	1	
	It controls product cost	Manufacturer	2.11	3.564	.000
		Wholeseller	3.00	1	
		Retailers	2.56	1	

## Table 1: Difference in SCI dimensions among channel partners

SCI dimensions	Items	Channel partners	Mean value	F-value	Level of
					significance
Production and	Production schedule is	Manufacturer	2.32	.765	.028
transportation	erratic	Wholeseller	1.22		
		Retailers	2.44		
	Cheap mode of transport	Manufacturer	2.31	14.623	.0421
	is always available	Wholeseller	3.35		
		Retailers	3.33		
Returns of	Goods are customised	Manufacturer	3.21	.636	.033
goods		Wholeseller	2.22		
		Retailers	2.77		
	Goods are competitive	Manufacturer	3.22	1.356	.000
		Wholeseller	2.33		
		Retailers	3.21		
	Defective goods are taken	Manufacturer	3.55	2.963	.011
	back	Wholeseller	3.87		
		Retailers	3.55	]	

## Moderation output

Hayes PROCESS macro has been used to test moderation. Performance outcome is treated as dependent variable (DV), Channel partners as independent variable(IV) and Innovation as moderator (MOD).



Moderation Model

The output from moderation shows (Table 2) that innovation may be the form of product, service or attitude significantly impact performance outcome. The *B* coefficient of independent variable, dependent variable and interaction effect are .5672, 4.2782 and 0.723 respectively with t values 3.8912, 1.2365 and 9.2673 significant at 0.05 level. The interaction effect is also significant as evident

from LLCI and ULCl values. Thus innovation moderates the relationship between channel partners and business performance.

				- T		
R	R-sq	MSE	F	$Df^{l}$	Df²	Р
0.8231	0.8513	2.5310	721.8236	3	237	0.0000

#### Table 2: Model summary

Model 1
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	Coeff	se	t	р	LLCI	ULCI
Constant	4.2782	1.7282	3.8912	0.0004	3.5284	9.3980
Independent	0.5672	0.3611	1.2365	0.0562	2.3963	8.6352
Moderator	0.2316	0.3278	1.3245	0.0362	-0.0524	0.9763
Interaction	0.7633	0.0844	9.2673	0.0000	-0.3764	-0.3765

#### Test(S) of highest order unconditional interaction(S)

	R <sup>2</sup> -chng	F	Df1	Df2	p
Predictor*	0.723	105.8254	1.0000	237	0.0000
Moderator					

# SCI constraints and challenges

In Table 3 only those items have been displayed which shows mean values less than 3.00. Regarding manufacturers, lowest mean response has been received for the item leadership and highest mean response at 3.00 for cost of integration. Lowest mean value for leadership & limited information and highest mean value for traditional inventory strategies have been observed from wholesalers. Retailers recorded lowest mean response at absence of trust (M=2.05) and highest for limited information technology (M=3.00)

Constraints in SCM Integration	Manufacturers Mean value	Wholesalers Mean value	Retailers Mean value
Limited information technology	2.73	2.00	3.00
Limited Information sharing	2.97	2.56	2.73
Absence of trust	2.44	2.85	2.05
Mis match between demand and supply	2.67	2.96	2.06
Inadequate knowledge	2.85	2.97	2.97
Cost of integration	3.00	2.77	2.57
Traditional inventory strategies	2.54	3.00	2.64
Leadership	2.00	2.06	2.55

#### Table 3: SCI Constraints

## **Conclusion and Managerial Implications**

Turbulent external and internal environment are posing threat to sustainability of organisations at market place.SCI is one feasible approach to cost reduction, product/ service improvement, adaptation and sustainability at market place. The focus of this study was to examine the relationships among supply chain partners, innovation & its impact on business performance and constraints in SCI integration. The research found that SCI exercises significant direct influence on business performance. These results are in line with previous studies (Wong, Boon-Itt & Wong, 2011; Lu et al., 2018; Errassafi, Abbar & Benabbou, 2019; Nartey, Aboagye-Otchere & Simpson, 2020; Liu, Liu & Gu, 2021; Hani, 2021). Innovation significantly moderates the relationship between channel partners and business performance. Several challenges such as technical, operational, strategic etc. become an obstacle in business process integration among different organizations. Output from one way ANOVA shows that manufacturer, wholesaler and retailers differ with regard to product planning, order processing, nature of discounts, return of defective goods, procurement of raw material, price stabilization .inventory management, control over cost of production, production schedule, nature of goods etc. These may be due to geographically dispersed manufacturing units and distant location of wholesalers and retailers. The *B* coefficient of independent variable, dependent variable and interaction effect are .5672, 4.2782 and 0.723 respectively with t values 3.8912,1.2365 and 9.2673 significant at 0.05 level displays that innovation moderates the relationship between channel partners and business performance. Several constraints ranging from technology, information sharing, leadership etc. were identified in achieving SCI.

To strengthen SCI linkages, it may be suggested that innovation eco system be created at work place which eventually enhance the competitiveness of the firm and create its value for its stakeholders. Internal integration can be achieved through the sharing of inventory, knowledge, transportation, warehousing and customer related information. Channel partners should implement digitations in production & marketing ranging from advanced manufacturing technologies with sensors, advanced robotics, advanced tracking , tracing technologies and additive manufacturing/3D printing (Ivanov et al., 2019). The usage of the internet and web based applications be encouraged among the parents of the supply chain. Further CRM and SRM should also be extended to external supply chain members such as customers and suppliers to reap greater benefits. More promising ICT policy should be developed CII(Confederation of Industry)level to facilitate the information technology infrastructures adoption by manufacturing firms. The company's culture and willingness to learn and assimilate knowledge from its customers, suppliers, or internally should be encouraged. Organizations must develop trust internally to create an organizational learning environment which significantly impact firms responsiveness and flexibility( Swift and Hwang,2013; Oke et al.,2013). Further, transformational leadership be developed among members of upper management level so that they become committed to learning, shared vision, open-mindedness and intra organizational knowledge sharing. Geographic limitations, inherent constraints in snow ball/referral sampling technique and scattered customers are some of the limitations of the study.

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