

The Impact of Supply Chain Management (SCM) Practices on Firm Performance (FP) in the Manufacturing Industry of Pakistan

Muhammad Aslam

aslamkhan00009572@gmail.com

Graduate, MPhil Management Sciences, Institute of Management Sciences (IMS), Lahore, Pakistan

Corresponding Author: * Muhammad Aslam aslamkhan00009572@gmail.com

Received: 16-11-2025

Revised: 30-11-2025

Accepted: 14-12-2025

Published: 27-12-2025

ABSTRACT

Productive and effective supply chain management (SCM) practices are essential to achieve maximum performance. This quantitative study investigated the impact of SCM practices on firm performance (FP) in Pakistan's manufacturing industry. Data was collected through questionnaire survey from respondents of supply chain area in manufacturing firms. Regression assumptions tests were conducted to check application of Regression model. Multiple Linear Regression analysis techniques were used for testing the research model to verify causal relationship of variables. Mediation analysis was carried out by conducting Hierarchical Linear Regression Technique. The IBM SPSS statistics software was used to check the relationships between the variable. Results show that these models as a whole as well as and the variables were significant. Further, mediation analysis was also conducted to test mediator variable with hierarchical regression analysis under bootstrap approach. Overall results confirm the mediator role of mediator variable. Recommendations have also been provided for optimization of SCM Practices through Customer Satisfaction to enhance Firm Performance.

Keywords: SCM Practices, Customer Satisfaction, Firm Performance, Manufacturing Sector

INTRODUCTION

Firm performance (FP) has gained maximum importance to attract new investors towards businesses. Therefore, managers and workers are responsible for running business must improve performance through application of new plan, procedures strategies and practices to take competitive edge in global market (Naknok, 2022; Almulhim et al., 2024).

SCM is the critical area of any modern firm on which survival and success in the industry is dependent. Modern industries are facing intense competition among rival firms. Many solutions are being utilized to compete and get ahead of rivals. Most appropriate ones are strategies and practices being used to optimize SCM systems. Achievement of SCM systems leads to enhance performance that helps in achieving competitive advantage.

Practitioners in industry suggest a variety of supply chain practices and strategies that are in use by prominent firms all over the world. Researchers are trying to conceptualize and test these supply chain practices and strategies to develop understanding of their level of importance and level of association with other phenomena. According to current status of research SCM has many predictors such as SCM practices (Li et al., 2006; Li, et al., 2005), Supply Chain strategies (Wisner, 2003), SCM capabilities (Tracey et al., 2005; Wu et al., 2006). SCM has many outcomes such as SCM efficiency and effectiveness (Heikkilä 2002); and SCM performance (Beamon 1999, Brewer & Speh 2000, Gunasekaran et al. 2001, Gunasekaran et al. 2004), and performance (Liu et al. 2013; Tracey et al. 2005; Wu et al. 2006; Wisner et al. 2003).

SCM also has Mediating and Moderating factors being used in recent researches such as Competitive advantage and Collaborative advantage (Zhang et al. 2002; Cao & Zhang 2010, Cao & Zhang 2011); Value and Quality (Lee, 2000; Lin et al. 2005); Customer Satisfaction and Employee Satisfaction (Chi & Gursoy 2009; Yu et al., 2013; Jacobs et al., 2016), Capacity and Agility (Liu et al., 2013; Swafford et al., 2006); Flexibility and Responsiveness (Handfield & Bechtel 2002).

Past research in this area includes different patterns that depict the supply chain area and its association with various outcomes such as performance, effectiveness, success, etc. recent research has changed the pattern by focusing on more recent and modern factors that may have favorable or unfavorable role in the field of SCM Systems.

Performance of any organization using supply or other modern functions is directly dependent on their success. This quantitative study investigated the impact of SCM practices on firm performance (FP) in Pakistan's manufacturing industry. Practitioners and researchers have been giving critical importance to this area in recent past.

LITERATURE REVIEW

Professionals of the Council of SCM (CSCMP) presented a comprehensive definition of supply chain, "SCM include the forecasted schedule and organizing the all activities concerned to sourcing and procurement, operations and all logistics administration activities as well as collaboration and coordination with relevant stakeholders".

Predictors in SCM have been reviewed and classified by various researchers in terms of practices, strategies, capabilities etc. Selection of any of these predictors depends on nature of industry and purpose of research. This study focuses on SCM Practices in manufacturing area of firms. Donlon (1996) explored the important concern of SCM that is how to maximize value in SCM systems.

Van Hoek (1998) elaborated about measurement and improvement of SCM performance. Author emphasized to develop the integrated supply chain system to measure the performance rather the traditional approach. New approach overcomes the limitations of old approach therefore, it would be helpful to lead the firm towards the optimization of Supply chain.

Tan et al. (1999) reviewed and conducted empirical study about impact of SCM on performance. The author identifies that there are many factors other than SCM elements, which have directly impact on corporate performance. He also concluded that the companies, which analyze the strategies of their competitors and predict the future requirement of their customers and continuously evaluate their performance with the supply chain mechanism can sustain their competitive edge.

Banfield (1999) wrote a book and explored how to harness value in the supply chain with strategic sourcing in action. Author tried to fill the gap between research trend and the requirement of professionals. Purchasing techniques and supplier programs were more times discussed in literature whereas strategies and techniques of implementation were not discussed. In his book writer introduced the approach of step by step implementation

Tan (2001) presented a literary structure of SCM. Researcher explained that with the passage of time different activities related to supply chain are merged according to strategic approach like logistics and material management operations management. Li et al., (2002) conducted research on practical basis to study SCM practices. In this study researcher has developed six dimensions which generally cover the practices in supply chain of organizations. Findings were based on the data collected from managers of 196 firms. He concluded that there was no difference in all supply chain practices regarding the position of the firm, however there were some difference in SCM practices with the variation of size and length of firm and supply chain (Gunasekaran, et al., 2001).

Rungtusanatham et al., (2003) explored association between SCM and operational activities from the perspective of resource based view (supplier and customer). Researcher presented a framework to explain the organizations linkage with its stakeholders in supply chain mechanism of internal operations. In given framework we can evaluate outcomes of the strategies implemented to link any organizations to its customer and supplier and how can firms maximize its operational performance (Cigoliniet et al., 2004; Chen & Paulraj, 2004; Li et al., 2006; Lenny, et al., 2007; Fawcett et al., 2008; Bayraktar et al., 2009).

Blanchard (2010) wrote a book on supply chain best practices. Researcher explained the best SCM practices, strategies, solutions and performance measures, which are adopted by leading firms. It can be very helpful for a company to develop supply chain model. Gimenez et al., (2012) conduct the study supply chain performance and integration by using moderating impact of supply chain complexity. In this research, it can be better understand the importance of supply chain integration. He concluded that supply chain integration increase the performance when a firm has to build the relations with buyers and supplier and this practice ultimately result to high supply complexity.

Prajogo and Olhager (2012) checked impact of strategic relationships, sharing, Information Technology and Logistics integration by studying the supply chain integration and its performance. However, in previous studies integration of logistics and Information Technology among supply chain stakeholder was discussed separately. However, researcher concluded that both type of integration has directly and indirectly significant impact on SCM performance.

Ageron et al. (2013) studied innovative supply chain practices and checked state of French companies. Researcher conducted this study in area of supply chain innovation from a different point of view. Previous research focus was particularly on product and relationships. Author find the impact of different practices, supplier collaboration and customer development on overall supply chain performance. He concluded that innovation in supply chain could play a vital role in competitive environment.

Golicic and Smith (2013) conducted a meta-analysis to explore the effects environmentally sustainable of practices in SCM on firm performance. Researcher concluded in this study that linking in different areas like marketing, operational and finance of organizations has positive and significant impact on performance of business firms (Morali & Searcy, 2013). Mohanty and Prakash (2014) conducted an empirical study in India to find the impact of green SCM practices. Author also pointed out causes of internal or external pressure for adopting the GSCM practices.

Govindan et al. (2014) found the sustainability as an outcome of SCM practices. Author presented a conceptual model by analyzing the data to assess the impact of green practices and lean supply chain on the sustainability of supply chain. He presented this catalogue for practitioners as a standard tool to select the possible practices for achievement of sustainable objectives.

Wolf (2014) studied the relationship among stakeholder pressure, sustainable SCM with corporate sustainability performance. Researcher analyzed that sustainable supply chain can positively contribute to enhance the performance of organization. This study evolves the model of three elements potential stakeholder, business firms' sustainable performance relationship and sustainable SCM. Author concluded that SSCM and pressure of stakeholders leads the firms to sustainable performance.

FP

Outcomes in SCM have been reviewed and classified by various researchers in terms of efficiency, effectiveness, performance, etc. Selection of any of these outcomes depends on nature of industry and purpose of research. This study focuses on Firm Performance. Important researches in this area have been mentioned next:

Beamon (1999) elaborated about measuring supply chain performance. He presented framework and processes to evaluate the performance measurement system of supply chain in manufacturing industry. As per researcher, views choosing the appropriate performance measures in supply chain are difficult due to complexity of the system.

Gunasekaran, et al., (2001) offered metrics and performance indicators in a supply chain environment. They analyzed that in business firm's supply chain is the main factor to make the operations effective and efficient, which ultimately leads to profit maximization. Researcher suggested that in the era of globalization where it is need to outsource the supporting activities other than core competencies organizations have to more focus on their supply chain system.

Hieber (2002) wrote book on SCM and presented techniques to quantify the performance with collaboration. In this book writer presented recommendation for practitioners that as it is necessary for organizations to streamline the internal business processes simultaneously they have to improve their external business relationships in supply chain network both in downstream and upstream. To measure the collaborative performance writer suggested an integral model, which provides the key performance indicators and guideline for implementations.

Chan (2003) presented the ways to measure supply chain performance. Researcher found the gap in existing literature that there is no logical combination of different performance measures. He introduced qualitative and quantitative performance measures other than the common criteria like quality and cost. After the analysis of performance the next step is decision making, the author presented techniques for decision making on the basis of priority in performance measures.

Chan and Qi (2003) presented a new approach to measure the performance of supply chain. As per researcher views SCM introduces a philosophy for business administration in sustainable competitive environment. Author introduced the “fuzzy set theory” to understand the circumstances during evolution process with innovative measure to analyze the performance.

Gunasekaran et al., (2004) introduced a framework to measure the performance of SCM. Researcher conducted the study on the basis of observation by collecting the data from selected British companies and relative current literature. He argued that in any organization performance measures and metrics play vital role in evaluation of performance, setting the objectives and to determine the future requirement.

Lai et al. (2004) carried out an empirical research on supply chain performance in logistics. Supply chain practices slightly differ from industry to industry or in manufacturing sectors to services sector because of different nature of job. Researcher conducted the study by survey in three different transport logistics industries named sea and air transport logistics, third party logistics services and freight forwarding to analyze the supply chain practices with the perspectives of services and cost. Researcher found the significant difference in Supply Chain Practices between three logistics firms.

Hervaniet al. (2005) presented a mechanism to measure the performance of Green SCM. Researcher discussed in this study issues like internal or external pressure, different measuring and evaluating tools in environmental supply chain. Researcher provides a framework for evaluation of green supply chain performance.

Shepherd and Günter (2006) elaborated ways to assess the SCM performance and indicate future directions. In this study researcher introduced a mechanism to measure the performance on practical basis, which provide a valued SCM system. Author suggested sharing performance information among the organizations. In the light of researcher views, organizations should create network to measure the performance by sharing information among the partners.

Gomes et al. (2006) studied practices related to performance measurement in manufacturing companies. Researcher highlighted the issues in performance measurement related to current practices in manufacturing firms. Author focuses on strategies for implications of theories related to performance measurement.

Van Der Vorst (2006) studied network of supply-chain to measurement the performance. For improving, the supply chain performance writer suggested to enhance collaboration in selected activities of supply chain. Comprehensive performance measurement system can direct management and design the chain for requisite performance.

Berrah and Clivillé (2007) presented system model in a supply chain to measure aggregate performance. Writer emphasized on formalization of supply chain performance and development of performance measurement system to analyze overall performance. To express the overall performance writer suggested globally recognized frameworks and model like MACBETH, AHP and SCOR model

Chae (2009) developed key indicators to measure supply chain performance in an industry. Researcher analyzed in this study that in organizations there is need to find the gap between planning and executions of policies and strategies, writer suggested that it is very crucial for practitioners to set the metrics and key performance indicator and suggest the guideline on practical basis.

Thakkar et al. (2009) presented a structure to measure the performance of SCM in SMEs. Researcher introduced a framework in different steps to evaluate the performance of SCM. The research was conducted particularly on small medium enterprises (SME) by adopting the both quantitative and qualitative approach. Author suggested setting of performance indicator in supply chain activities like “source”, “make” or “buy”. This study is helpful for managers in SME.

Bigliardi and Bottani (2010) used a balanced scorecard theory to gauge the performance in the food supply chain. In this study researcher developed a model “balanced score card” (BSC) to measure the performance in food supply chain. Researcher developed this on basis of “Delphi technique” and analysis of previous relevant literature. For checking the validity of this model author got the similar views from three different companies.

Wiengarten et al. (2010) presented collaborative approach in SCM practices which affect performance and considered the vital role of quality of information. Researcher analyzed that in collaborative supply chain level of information sharing develop the operational performance in the organizations. Jointly decision making approach in mutual SCM mechanism among the organizations has considerable impact on overall performance of the organization.

Cuthbertson and Piotrowicz (2011) introduced a framework to scrutinize contextually and calculate the performance of SCM systems. Author proposed a common or general framework to analyze the performance of supply chain in any situation. To assess the performance of supply chain researcher emphasized firms have to fully aware about the background or current scenario in which company is being operated.

Arlbjørn and Lüthje (2012) introduced the ways to analyze the supply chain performance with the perspective of a global operation and their mutual internal coordination. Florian and Constancioara (2013) studied the impact of supply chains on FP in Romania. Researcher conducted this study in Romanian business firms from different sectors to analyze the impact of SCM performance on organizational performance. Author also introduced metrics to evaluate the performance of SCM. He finally concluded in this study that effects of SCM performance is significant on overall performance of organizations

Marwah et al., (2014) presented measuring indicators of supply chain performance in manufacturing firms of India. This study was conducted to find the gaps in performance measurement system of supply chain. Researcher suggested different determinants to measure the performance in supply chain manufacturing industry of India. Author finally concluded that business firms could enhance the supply chain performance by improving the strategies and practices by analyzing the suitable determinants which can enhance the SCM performance.

Tipu and Fantasy (2014) conducted a comparative study of small medium enterprises in Canada and Pakistan to analyze the supply chain strategy performance and flexibility. SCM performance, flexibility and strategic relationships in the environment of SMEs in Pakistan and Canada were discussed in this research. Study result somewhat confirm the earlier findings in Canadian SMEs with the perspective of strategic relationships whereas prior these firms adopted customer oriented and innovative strategies. However, such strategies were adopted by SMEs in Pakistan.

Other factors (mediators and moderators) in SCM have been used increasingly in recent researches such as Competitive advantage, Collaborative advantage, Value, Quality, Customer Satisfaction, Employee Satisfaction, Capacity, Agility, Flexibility, and Responsiveness etc. Selection of any of these mediating or moderating factors depends on nature of industry and purpose of research. This study focuses on Customer Satisfaction through the SCM mechanism to enhance the Performance of Firms.

Customer Satisfaction

Heskett, et al. (1994) elaborated on putting the service–profit chain to work. Researcher presented guideline for professionals that they should focus on both internal and external stakeholders especially on frontline workers and customers. Author argued that performance could be enhanced by gaining the customer loyalty.

Ellinger et al., (1999) studied customer satisfaction and loyalty in supply chain and checked role of communication. Research suggested that organization should make the communication more effective between customer and seller for effective supply chain. He further explained organizations should have proactive approach to analyze customers’ needs because satisfied customers are more reliable than unsatisfied customers are.

Heikkilä (2002) elaborated supply and demand chain management and studied efficiency and customer satisfaction. Researcher suggested in this study a dependable and consistent flow of information to bridge between consumer and supplier. This mechanism provides accuracy of customer demands, which ultimately enable the organizations to fulfill the customer requirement.

Kassinis and Soteriou (2003) elaborated the concept of managerial practices in greening services of environment to maximize the profit. This study was conducted in European culture with the aim to identify the environmental practices, which affect the performance in hospitality industry. Researcher concluded that existing mediating role of customer satisfaction has positive impact on overall performance.

Kurata and Nam (2010) studied the competition of after sales services in supply chain and examined how to attain the customer satisfaction level or maximize the profit or both. This study was conducted to discuss the strategies to attain or retain the customers by enhancing the customer satisfaction level. Researcher concluded that after sales services offered by the companies directly impact on customer purchase decision.

Ellinger et al., (2012) analyzed to understand the effects of SCM competencies on shareholder value and customer satisfaction. Researcher concluded the positive impacts of association between applicability of SCM practices and firm performance.

Haque and Islam (2013) conducted a study about customer satisfaction to analyze the significant impact of SCM practices in Pharmaceutical manufacturing industry of Bangladesh. Researcher recommended the dimension in SCM practices and scrutinize proposed structure model of relationships between these dimensions and customer satisfactions. Researcher concluded that customer satisfaction level could be increased by selecting the appropriate SCM practices. Mishra and Shekhar (2013) conducted a study in supply chain department of dairy food in India to analyze the customer satisfaction with relation to consumer behavior and brand image.

Politis et al. (2014) carried out study about supply chain of manufacturing companies in Greece to scrutinize the effects of the quality in logistics service on customer satisfaction. Author also presented parameters to assess the quality of logistics services in manufacturing sector, which leads to customer satisfaction. Researcher also discussed the supplier’s weak point, which causes of hindrance to customer satisfaction and suggested dimension, which increase the customer satisfaction level.

Yu et al., (2013) highlighted the customer satisfaction and financial performance outcomes from the perspective of organizational learning by empirically testing the considerable impact of SCM integration. Researcher concluded that integration at both level in upward and downward stream has significant effect on financial performance. In external integration, research included the both customer and supplier.

Predictors in SCM have been researched commonly in terms of practices, strategies, capabilities etc. These predictors have been studied in various countries but there was lack of research in Pakistani population in most of these predictors. Thus, current study was conducted with the aims to fill this gap through a comprehensive investigation of “SCM Practices” and its impact on organizational performance.

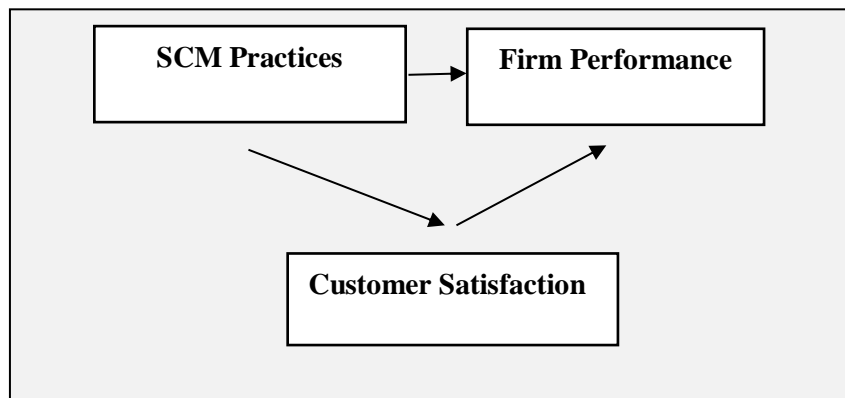
Outcomes in SCM have been researched commonly in terms of efficiency, effectiveness and performance but this study for applicability of these practices in manufacturing organizations with the perspective of customer

satisfaction has been conducted in the population of Pakistan. Mediating and Moderating factors in SCM have been used in terms of Competitive advantage, Collaborative advantage, Value, Quality, Customer Satisfaction, Employee Satisfaction, Capacity, Agility, Flexibility, Responsiveness etc. This means these factors have been less studied yet. Thus, current study has been conducted with the aims to fill this gap through adopting the important factor of Customer Satisfaction in SCM and with Firm Performance. Further, this study also contributes in new literature by using organizational perspective of Customer Satisfaction in SCM that is rarely used yet.

“SCM Practices” is the main independent variable. Li et al. (2005), presented a comprehensive definition of SCM practices as “The set of actions as per the type and nature of functions adopted by various organizations to ensure the effective management of its supply chain”. It includes multiple components or indicators, which are “Customer Relationship”; “Strategic Supplier Partnership”; “Quality of Information Sharing”; “Postponement”; and “Level of Information Sharing”.

“Firm Performance” is the main dependent variable. To measure the performance of a firm from various perspectives the main indicators “Business”; “Operations”; and “Customer Service” have been assessed. “Customer Satisfaction” is the main mediating variable. Expectation level of the customers is the degree to which SCM practices required implementations to enhance the firm performance. The research framework or model for the current study is developed with independent, dependent, and mediating variables. This selection is based on the analysis of variables mentioned in literature review. The proposed research framework is presented with sources of selected variables.

Figure 1: Conceptual Model



The hypotheses statements are developed to empirically test the framework or model.

- **H₁**: “SCM Practices” have significant and positive effect on “Firm Performance”.
- **H₂**: “SCM Practices” have significant and positive effect on “Customer Satisfaction”.
- **H₃**: “Customer Satisfaction” has significant and positive effect on “Firm Performance”.
- **H₄**: “Customer Satisfaction” has significant mediation effect between the relationship of “SCM Practices” and “Firm Performance”.

RESEARCH METHODOLOGY

This research is descriptive in nature and involves the testing of models empirically using numerical data. Thus, quantitative approach is appropriate for this study. Secondary sources of data for research were previous literature in the similar area of the current study. Primary data was collected using questionnaire in the supply chain department of manufacturing firms in Pakistan. Details of Population and sampling design are explained below:

There are two broad sectors related to supply chain that are manufacturing sector and services sector. Population of this research includes manufacturing sector in Pakistan. It includes multiple industries such as Food industry, Textile industry, Chemical industry, Pharmaceutical Industry and others. A sampling frame was used to draw a sample from this population according to sample size and sampling technique that have been discussed below.

Non-Probability sampling technique was selected due to large population. Convenience sampling method was adopted for drawing a sample. Source of sample for this research is a list of organizations from manufacturing sector. Some of the industries were included such as food industries.

The sample size was determined by using the most common method which is suggested by Krejcie and Morgan (1970) for calculating sample size for both known population and unknown population. It calculates sample sizes under a certain criteria. This method is used with Significance level 5%, Degree of accuracy 5% and population proportion assumed as 50%. By using above stated technique, 384 respondents fulfill the requirement of sample size for this research. Detail of measurement tool for data collection and its validity and reliability is mentioned below.

In this research Questionnaire was used as a measurement tool for data collection. The questionnaires and scales for all the variables of this research were adopted from pre-validated sources from previous literature. Each construct has multiple questions (items). Statements of Questionnaire's items were used along 5- point "Likert scale" that ranges from 1 to 5 (Strongly Disagree to Strongly Agree). Sources of Measures and Scales are given in the Table 1 below:

Table 1: Sources of Measures and Scales

Constructs	Measures	Items	Scales	Sources
SCM Practices	Strategic Supplier Partnership	6	5 point Likert-type scale: From Strongly Disagree up to Strongly Agree	Adopted from Li et al. (2005)
	Customer Relationship	5		
	Level of Information Sharing	6		
	Quality of Information Sharing	5		
	Postponement	3		
Firm Performance	Business	2	5 point Likert-type scale: From Strongly Disagree up to Strongly Agree	Adopted from Liu et al. (2013)
	Operations	2		
	Customer Service	2		
Customer Satisfaction	-	3	5 point Likert-type scale: From Strongly Disagree up to Strongly Agree	Adopted from Yu et al., (2013)

Validity was confirmed by content validity through Pre- validated studies, Expert opinion, Pilot study and construct validity through factor analysis. Data was collected through questionnaire survey from respondents of supply chain area in manufacturing firms.

In this study, descriptive statistics (Frequency & Percentage) were used for demographic profile. Reliability and Validity tests were conducted to check Reliability and Validity of instrument. Regression assumptions tests were conducted to check application of Regression model. Multiple Linear Regression analysis techniques were used for testing the research model to verify causal relationship of variables. Mediation analysis was carried out by conducting Hierarchical Linear Regression Technique. All the statistical analyses tests were done using latest version of IBM SPSS statistics software.

ANALYSIS AND RESULTS

The Demographics data has been analyzed using descriptive statistics (Frequency distribution & charts) that presents a demographic profile of the participants of this survey, which mentioned in **Table 2**.

Table 2: Descriptive Statistics of Demographics

Demographics	Options	Frequency	Percentage
Gender	Male	205	75.9
	Female	65	24.1
Marital Status	Unmarried	79	29.6
	Married	191	70.4
	Other	0	0
Age Group (In Years)	Below 21	4	1.5
	21-to-25	35	13.0
	26-to-30	69	25.6
	31-to-35	78	28.9
	36-to-40	84	31.1
	Above 40	0	0
Education (In Years)	Below 14	0	0
	14	136	50.4
	16	127	47.0
	18	7	2.6
	Above 18	0	0
Work Experience (In Years)	Below 1	3	1.1
	1-to-4	115	42.6
	5-to-8	72	26.7
	9-to-12	78	28.9

	13-to-16	2	0.7
	Above 16	0	0

The response rate of the survey is 70.3% (Total responses 270 out of 384 sample). Descriptive statistics of Demographic Variable Gender are shown in Figure 2.

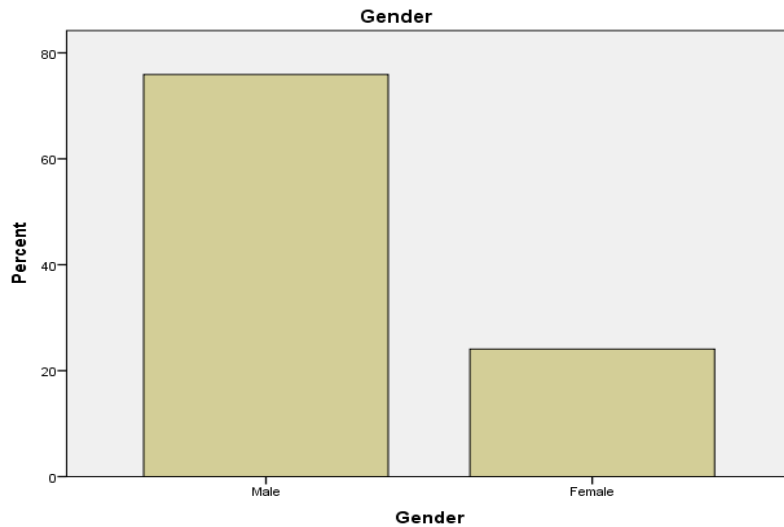


Figure 2: Demographics – Gender

Results for “Gender” frequency distribution show that (75.9%) of the respondents are male and (24.1%) are females. It indicates that in supply chain department of manufacturing industry in Pakistan ratio of male worker is large than female. Descriptive statistics of Demographic Variable Marital Status are shown in Figure 3.

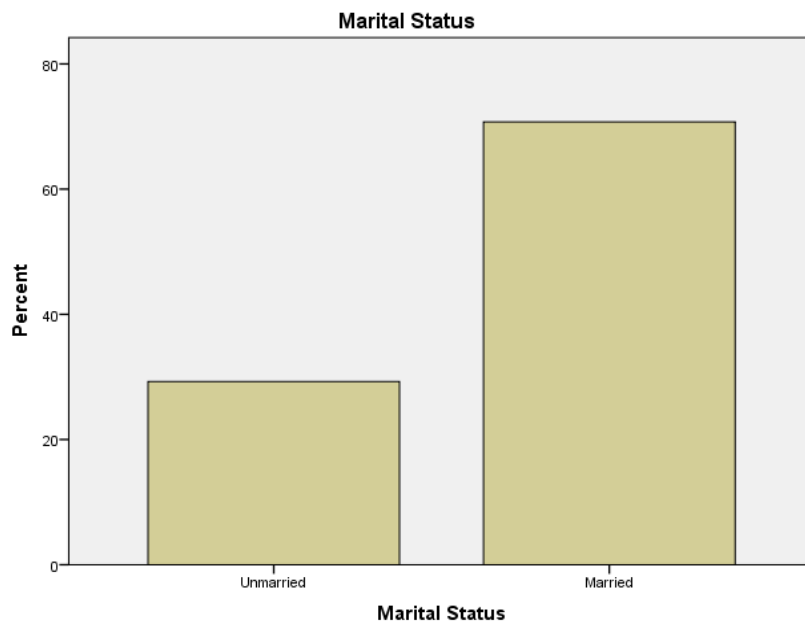


Figure 3: Demographics, Marital Status

The frequency distribution of “Marital Status” shows that most of the respondents (70.4%) are married and other respondents (29.6%) are unmarried. Results also show that large ratio was of married and mature workers. Descriptive statistics of Demographic Variable Age Group are shown in Figure 4.

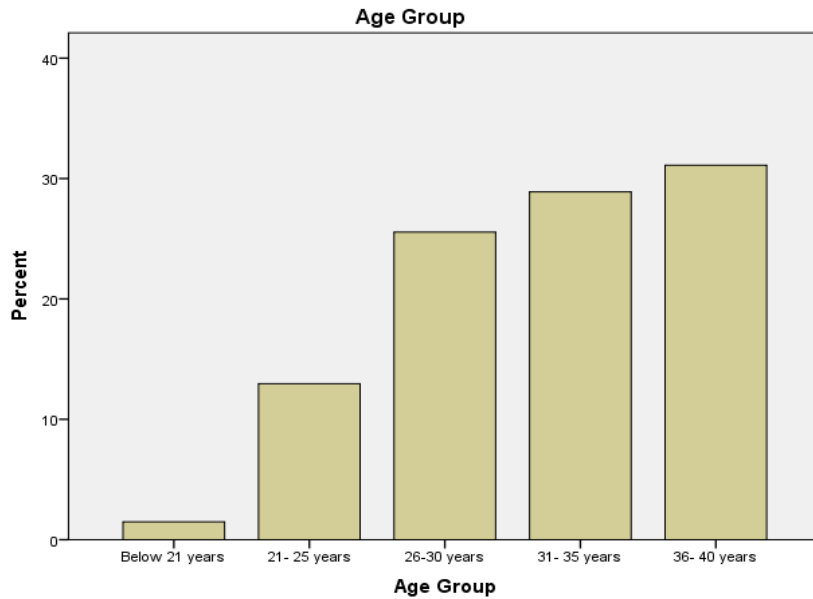


Figure 4: Demographics, Age Group

Result shows that many of the respondents (28.9%) are below 31- 35 years old; and many of the respondents (31.1%) are 36- 40 years old. Whereas, some of the respondents (25.6%) are 26-30 years; and a few of the respondents (13%) are 21-25 years old; and a few of the respondents (1.5%) are Below 21 years old. As per these results, a larger proportion of respondents (85.5%) is middle aged (26-40 years) and a smaller proportion of respondents (14.5%) is young aged. Descriptive statistics of Demographic Variable Education Level are shown in Figure 5.



Figure 5: Demographics, Education Level

The frequency distribution of “Education” shows that many of the respondents (50.4%) have 16 years of education; and many of the respondents (47.0%) have 14 years of education. However a few of the respondents (2.6%) have above 18 years of education. As per these results, the majority (97.4%) is moderately educated (14-16 years of education) and the minority (2.6%) is highly educated (18 years of education). Descriptive statistics of Demographic Variable Work Experience are shown in Figure 6.

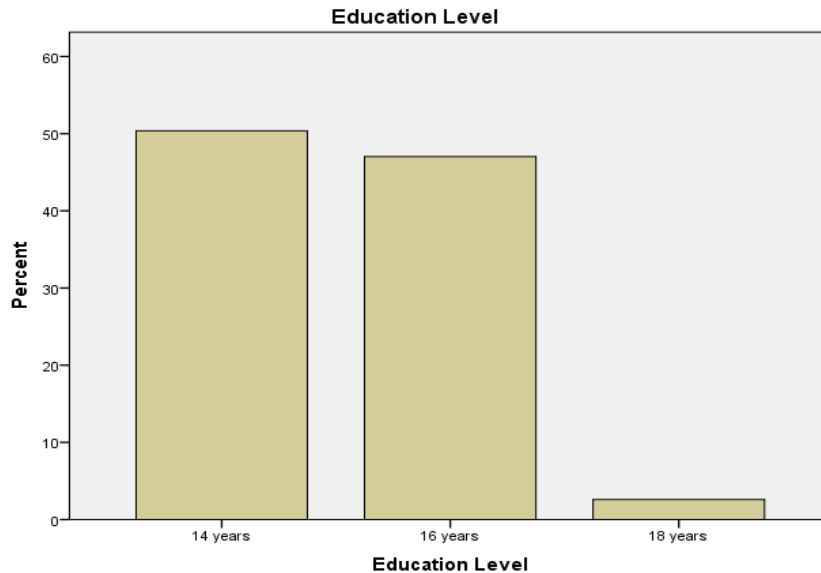


Figure 6: Demographics, Work Experience

The frequency distribution of “work experience” shows that many of the respondents (42.6%) of the respondents has 1-4 years’ work experience; and some of the respondents (26.7%) of the respondents have 5-8 years’ work experience; and some of the respondents (28.9%) of the respondents have 9-12 years’ work experience. Whereas, a few (1.1%) have work experience below 1 year and a few (0.7%) have work experience 13-16 years. As per these results, majority of the respondents (57.4%) are highly experienced (5-16 years); and minority of the respondents (42.6%) are with low experienced (1-4). Large portion of respondents contributed on the basis of vast experiences who are working in SCM department of manufacturing firms of Pakistan.

Validity and Reliability

The research variables data must be valid and reliable for carrying out regression analysis, therefore validity and reliability were checked before carrying out further analyses. Content validity of measuring tool and data was confirmed in Pre- validated studies, Expert opinion, and Pilot study. Construct validity of measuring tool and data was checked through factor analysis. Its pre requisites are Kaiser-Meyer-Olkin (KMO) and Bartlett’s tests. Results of both tests are mentioned in Table 3.

Table 3: Validity Statistics

KMO and Bartlett's Test	Results		Validity Level
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	KMO	.859	Acceptable
Bartlett's Test of Sphericity	Approx. Chi-Square	4641.766	Significant
	df	36	
	Sig.	.000	

As per the KMO results the value .859 that is acceptable as it is closer to 1.0. Validity Statistics show that Bartlett's test has Chi-Square value 4641.766 that is also significant as it is higher than table value with p-value .000 that is also significant as it is lower than 0.05. Based on these results factor analysis is suitable for this model but factor analysis was not required because there is no need of data reduction.

For reliability of constructs, results of Cronbach's alpha values for all constructs are mentioned in Table 5.3:

Table 4: Reliability Statistics

Constructs	N	No. of Items	Cronbach's Alpha	Reliability Level
SCM PRACTICES	270	25	.935	Acceptable
FIRM PERFORMANCE	270	6	.950	Acceptable
CUSTOMER SATISFACTION	270	3	.910	Acceptable

Cronbach's Alpha reliability coefficients of all the constructs (SCM Practices, Firm Performance, and Customer Satisfaction) for their number of items are at high levels ranging from .91 to .95 that is within standard range. As the high reliability level of all constructs is at acceptable levels, therefore, the given measurement instrument is reliable.

Regression Analyses

The research variables data has been analyzed using mainly regression analysis technique that presents extent and significance of relationships among all variables. Further, these results confirm hypotheses statements. Steps of Regression analysis technique, in case of Mediating variable present are given.

- **REG 1: IV → DV** (Direct relationship between IV & DV without MV)
- **REG2: IV → MV** (relationship between IV & MV)
- **REG3: MV → DV** (relationship between MV & DV)
- **REG4: IV + MV → DV** (Indirect relationship between IV & DV with MV)

Assumptions are tested for all the regression models of research framework mentioned above. The results of assumptions are given in Table 5 to Table 6.

Table 5: Assumptions for Regression Model 1 (REG1: IV → DV)

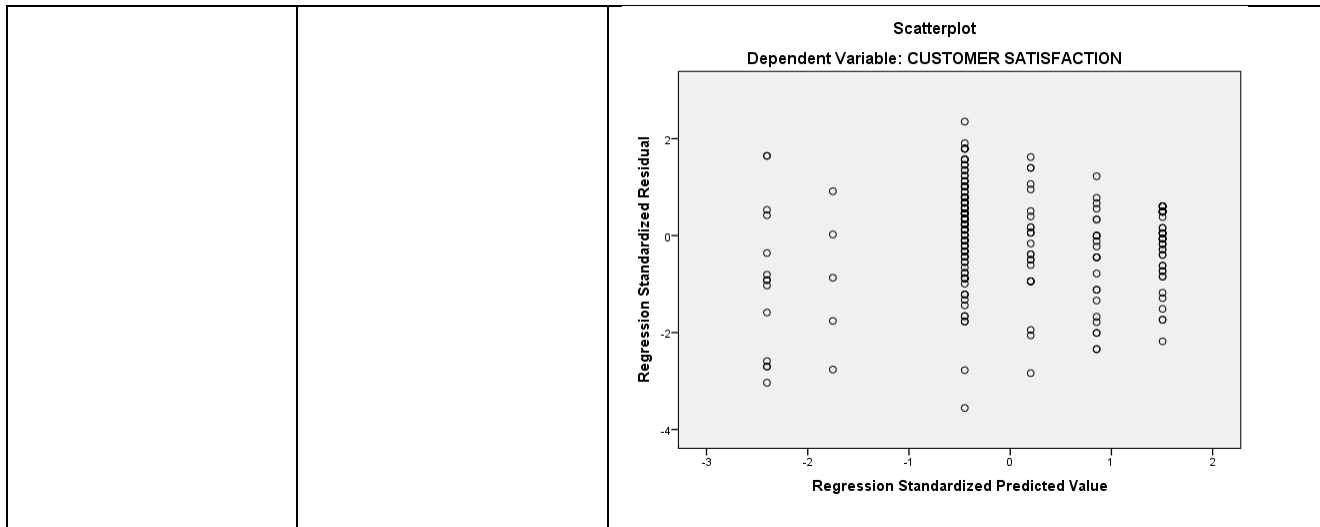
Assumptions	Tests	Results
Auto Correlation	Auto Correlation Statistics	Durbin-Watson: 2.239
Heteroscedasticity	Regression Plots	Scatterplot diagram: <div style="text-align: center;"> </div>

Regression Model 1 is based on relationship of SCM Practices with Firm Performance. As per the table above, the results of regression assumptions for this model are following:

Durbin-Watson test is 2.239, which is closer to 2.0, which indicates the absence of Autocorrelation. Heteroscedasticity was tested using Scatter Plot diagram that shows mostly scattered data for model and there is no systematic pattern, which indicates the absence of Heteroscedasticity.

Table 6: Assumptions for Regression Model 2 (REG2: IV → MV)

Assumptions	Tests	Results
Auto Correlation	Auto Correlation Statistics	Durbin-Watson: 1.244
Heteroscedasticity	Regression Plots	Scatterplot diagram:



Regression Model 2 is based on relationship of SCM Practices with Customer Satisfaction. Durbin-Watson test is 1.244, which is closer to 2.0; it indicates the absence of Autocorrelation. Heteroscedasticity was tested using Scatter Plot diagram that shows mostly scattered data for model and there is no systematic pattern, which indicates the absence of Heteroscedasticity.

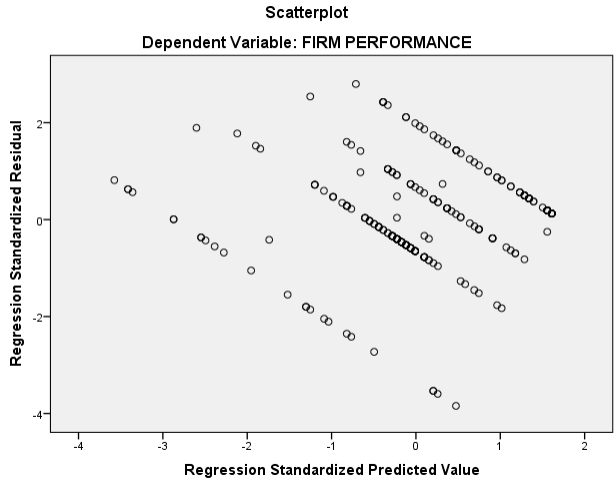
Table 7: Assumptions for Regression Model 3 (REG3: MV → DV)

Assumptions	Tests	Results
Auto Correlation	Auto Correlation Statistics	Durbin-Watson: 1.923
Heteroscedasticity	Regression Plots	Scatterplot diagram: <div style="text-align: center; margin-top: 10px;"> </div>

Regression Model 3 is based on relationship of Customer Satisfaction with Firm Performance. As per the table above, the results of regression assumptions for this model are following:

Durbin-Watson test is 1.923, which is closer to 2.0., it indicates the absence of Autocorrelation. Heteroscedasticity was tested using Scatter Plot diagram that shows mostly scattered data for model and there is no systematic pattern, which indicates the absence of Heteroscedasticity.

Table 8: Assumptions for Regression Model 4 (REG4: IV + MV → DV)

Assumptions	Tests	Results
Auto Correlation	Auto Correlation Statistics	Durbin-Watson: 2.073
Heteroscedasticity	Regression Plots	Scatterplot diagram: 

Regression Model 4 is based on relationship of SCM Practices and Customer Satisfaction with Firm Performance. As per the table above, the results of regression assumptions for this model are following:

Durbin-Watson test is 2.073, which is too closer to 2.0; it indicates the absence of Autocorrelation. Heteroscedasticity was tested using Scatter Plot diagram that shows mostly scattered data for model and there is no systematic pattern, which indicates the absence of Heteroscedasticity.

Overall finding of regression assumptions based on results given above are presented below:

Autocorrelation has been tested using Autocorrelation Statistics (Durbin-Watson test) for all the models. Durbin-Watson test for all models range from 1.2 to 2.3, which is closer to 2.0 therefore, it shows the absence of Autocorrelation. Autocorrelation is zero when Durbin-Watson test has exact value of 2.0, whereas values too low or too high are not acceptable but any value close to 2.0 is also acceptable. Therefore, the above results are acceptable. That is commonly justified in behavioral studies.

Heteroscedasticity was tested using Scatter Plot diagram for all models that shows mostly scattered data for all models, which indicates absence of Heteroscedasticity. Thus, as per these results it can be concluded that overall all the assumption of regression are fulfilled for given models of research framework. Therefore, regression analysis technique is applicable for this research framework.

Regression analyses have been conducted for all the specified models.

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.661 ^a	.437	.435	.43345

a. Predictors: (Constant), SCM PRACTICES

As per results given above, Adjusted R Square is .435 and standard error of the estimate is .43345, which means this model explains 43.5 % variance and 43.345 % error chances. Results vary from standards because variance is usually high in behavioral data, therefore, values below standard are also acceptable. That is commonly justified in behavioral studies.

Table 10: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.135	1	39.135	208.299	.000 ^b
	Residual	50.351	268	.188		
	Total	89.486	269			

a. Dependent Variable: FIRM PERFORMANCE

b. Predictors: (Constant), SCM PRACTICES

As per results given above, F-statistic value of this model is 208.299 that is significant, and P-value is 0.000 that is also significant, which means this model as a whole is significant.

Table 11: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.097	.220		4.986	.000
	SCM PRACTICES	.745	.052	.661	14.433	.000

a. Dependent Variable: FIRM PERFORMANCE

As per results given above, for the variable SCM PRACTICES its t-statistic value is 14.433 that is significant, and its P-value is 0.000 that is also significant, which means this variable is significant. Results show that for SCM PRACTICES standardized coefficient of Beta value is .661 that means 1SD increase in independent variable SCM PRACTICES causes 66.1% increase in dependent variable FIRM PERFORMANCE.

REG Model 2: IV → MV

Table 12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.690 ^a	.476	.474	.35879

a. Predictors: (Constant), SCM PRACTICES

As per results given above, Adjusted R Square is .474 and standard error of the estimate is .35879, which means this model explains 47.4% variance and 35.879% error chances. Results vary from standards because variance is usually high in behavioral data, therefore, values below standard are also acceptable. That is commonly justified in behavioral studies.

Table 13: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	31.316	1	31.316	243.269	.000 ^b
Residual	34.500	268	.129		
Total	65.816	269			

a. Dependent Variable: CUSTOMER SATISFACTION

b. Predictors: (Constant), SCM PRACTICES

As per results given above, F-statistic value of this model is 243.269 that is significant, and P-value is 0.000 that is also significant, which means this model as a whole is significant.

Table 14: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.449	.182		7.954	.000
SCM PRACTICES	.667	.043	.690	15.597	.000

a. Dependent Variable: CUSTOMER SATISFACTION

As per results given above, for the variable SCM PRACTICES its t-statistic value is 15.597 that is significant, and its p-value is 0.000 that is also significant, which means this variable is significant. Results show that for SCM PRACTICES standardized coefficient of Beta value is .690 that means 1SD increase in independent variable SCM PRACTICES causes 69.0% increase in dependent variable CUSTOMER SATISFACTION.

REG Model 3: MV → DV

Table 15: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.721 ^a	.520	.518	.40027

a. Predictors: (Constant), CUSTOMER SATISFACTION

As per results given above, Adjusted R Square is .518 and standard error of the estimate is .40027, which means this model explains 51.8% variance and 40.027% error chances. Results vary from standards because variance is usually high in behavioral data, therefore, values below standard are also acceptable. That is commonly justified in behavioral studies.

Table 16: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	46.548	1	46.548	290.531	.000 ^b
Residual	42.938	268	.160		
Total	89.486	269			

a. Dependent Variable: FIRM PERFORMANCE

b. Predictors: (Constant), CUSTOMER SATISFACTION

As per results given above, F-statistic value of this model is 290.531 that is significant, and p-value is 0.000 that is also significant, which means this model as a whole is significant.

Table 17: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.660	.212		3.111	.002
	CUSTOMER SATISFACTION	.841	.049	.721	17.045	.000

a. Dependent Variable: FIRM PERFORMANCE

As per results given above, for the variable CUSTOMER SATISFACTION its t-statistic value is 17.045 that is significant, and its p-value is 0.000 that is also significant, which means this variable is significant. Results show that for CUSTOMER SATISFACTION standardized coefficient of Beta value is .721 that means 1SD increase in independent variable CUSTOMER SATISFACTION causes 72.1% increase in dependent variable FIRM PERFORMANCE.

REG Model 4: IV + MV → DV

Table 18: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756 ^a	.571	.568	.37903

a. Predictors: (Constant), CUSTOMER SATISFACTION, SCM PRACTICES

As per results given above, Adjusted R Square is .568 and standard error of the estimate is .37903, which means this model explains 56.8% variance and 37.903% error chances. Results vary from standards because variance is usually high in behavioral data, therefore, values below standard are also acceptable. That is commonly justified in behavioral studies.

Table 19: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51.129	2	25.564	177.951	.000 ^b
	Residual	38.357	267	.144		
	Total	89.486	269			

a. Dependent Variable: FIRM PERFORMANCE

b. Predictors: (Constant), CUSTOMER SATISFACTION, SCM PRACTICES

As per results given above, F-statistic value of this model is 177.951 that is significant, and p-value is 0.000 that is also significant, which means this model as a whole is significant.

Table 20: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.243	.214		1.135	.257
	SCM PRACTICES	.352	.062	.313	5.647	.000
	CUSTOMER SATISFACTION	.590	.065	.506	9.137	.000

a. Dependent Variable: FIRM PERFORMANCE

As per results given above, for the variable SCM PRACTICES its t-statistic value is 5.647 that is significant, and its p-value is 0.000 that is also significant, which means this variable is significant. Whereas, for the variable CUSTOMER SATISFACTION its t-statistic value is 9.137 that is significant, and its p-value is 0.000 that is also significant, which means this variable is significant. Results show that for SCM PRACTICES standardized coefficient of Beta value is .313 that means 1SD increase in independent variable SCM PRACTICES causes 31.3% increase in dependent variable FIRM PERFORMANCE. Whereas, for CUSTOMER SATISFACTION standardized coefficient of Beta value is .506 that means 1SD increase in independent variable CUSTOMER SATISFACTION causes 50.6% increase in dependent variable FIRM PERFORMANCE.

Mediation Analysis

Mediating role of the mediating variable is also necessary to be confirmed after testing all the relationships among all the variables. As per research framework a mediating variable is used between independent and dependent variables that must be tested to confirm its mediating role. As the framework is causal and regression analysis technique has been used for its analysis, thus mediation is also analyzed using regression analysis technique.

Many approaches for mediation analysis can be used but new acceptable approach (bootstrapping) is used here instead of old outdated approaches (Barron, Kenny, Sobel, etc.).

Many procedures/methods are available to apply for mediation analyses techniques. Commonly Hierarchical Linear Regression is used for basic regression models whereas Path Analysis is used for advanced regression models. For this study, mediation analysis of the mediating variable has been carried out using Hierarchical Linear Regression Modeling. Some new tools or (add-ons or plugins) are also available to be used with statistical analysis programs that are helpful to run this analysis in effective way.

This mediation regression analysis includes results of direct relationship and indirect relationship among independent and dependent variables of the research framework; as well as comparison of direct effect & indirect effect of these relationships. Initially hierarchical regression under bootstrap approach is done to get direct and indirect relationships for mediation analysis. Results of Mediation Regression are given in Table 21.

Table 21: Hierarchical Regression for Direct and Indirect Relationships – Bootstrap approach

Outcome: CSAT						
Model Summary						
R	R-sq	MSE	F	df1	df2	p
.6898	.4758	.1287	243.2695	1.0000	268.0000	.0000
Model						
	coeff	se	t	p	LLCI	ULCI
constant	1.4488	.1821	7.9542	.0000	1.0902	1.8074
SCMP	.6668	.0428	15.5971	.0000	.5826	.7510
Outcome: FPER						
Model Summary						
R	R-sq	MSE	F	df1	df2	p
.7559	.5714	.1437	177.9510	2.0000	267.0000	.0000
Model						
	coeff	se	t	p	LLCI	ULCI
constant	.2429	.2139	1.1354	.2572	-.1783	.6641
CSAT	.5896	.0645	9.1373	.0000	.4626	.7167
SCMP	.3523	.0624	5.6469	.0000	.2294	.4751

The first model with CSAT as the outcome provides path a (.6668) and a test of statistical significance where t = 15.5971, p = .0000. As per results given above, it is clear that all the results are satisfactory. Therefore, direct relationship among independent variable and dependent variable is significant. The second model with FPER as the dependent variable and both CSAT and SCMP as predictors provides paths b (.5896) and c' (.3523) with test of statistical significance where t = 9.1373, p = .0002 for Customer Satisfaction while where t = 5.6469, p = .0000 for SCM Practices. Further, 95% confidence intervals for these two parameters are also created through bootstrapping, where LLCI is the Lower Limit Confidence Interval and ULCI is the Upper Limit Confidence Interval. As per results given above, it is clear that all the results are satisfactory. Therefore, indirect relationship among independent variable and dependent variable is significant.

Further, Analysis of direct effect & indirect effect is done for testing presence of mediation and significance of mediation. Results of direct effect and indirect effect for the mediation regression analysis are given in Table 22

Table 22: Analysis of Direct Effect and Indirect Effect

Direct effect of X on Y					
Effect	SE	t	p	LLCI	ULCI
.3523	.0624	5.6469	.0000	.2294	.4751
Indirect effect of X on Y					
Effect	Boot SE	BootLLCI	BootULCI		
CSAT	.3932	.0618	.2726	.5164	

Comparison of direct effect & indirect effect in terms of the product of paths “a” and “b” that’s (.6668 * .5896) = .3931 as well as in terms of difference of paths “a” and “b” is also same, which show that a substantial effect is present due to the presence of CSAT as a mediator. As per results given above, it is clear that all the results are satisfactory. Therefore, the indirect effect (in presence of CSAT) of SCM Practices (independent variable) on FP (dependent variable) is significant. Presence of Mediation effect is found to be present mediation due to significant substantial effect present for both direct and indirect relationships. Level of Mediation effect is found to be as Partial Mediation due to both direct and indirect effects are significant.

Result of Hypotheses Testing

The relationships among different variables were tested through regression analysis. The results are shown in Table 23.

Table 23: Hypotheses Result

Hypotheses Statements	Direction	Result
H₁: SCM PRACTICES → FIRM PERFORMANCE	“Positive”	Supported
H₂: SCM PRACTICES → CUSTOMER SATISFACTION	“Positive”	Supported
H₃: CUSTOMER SATISFACTION → FIRM PERFORMANCE	“Positive”	Supported
H₄: CUSTOMER SATISFACTION → SCM PRACTICES & FIRM PERFORMANCE	“Positive”	Supported

First hypothesis proves that independent variable and dependent variable are directly associated as independent variable (SCM PRACTICES) has significant and positive impact on dependent variable (FIRM PERFORMANCE).

Second hypothesis proves that independent variable is associated with mediating variable as independent variable (SCM PRACTICES) has significant and positive impact on mediating variable (CUSTOMER SATISFACTION). Third hypothesis proves that mediating variable is associated with dependent variable as mediating variable (CUSTOMER SATISFACTION) has significant and positive impact on dependent variable (FIRM PERFORMANCE). Fourth hypothesis proves that mediating variable has mediating role with association between independent variable (SCM PRACTICES) and dependent variable (FIRM PERFORMANCE). The findings indicate that all the hypotheses statement tested in this study have been supported successfully.

The hypotheses statements are supported as per results and interpretations given previously in data analyses. Association of independent variable (SCM PRACTICES) with dependent variable (FIRM PERFORMANCE) is successfully confirmed. Association of independent variable (SCM PRACTICES) with mediating variable (CUSTOMER SATISFACTION) is successfully confirmed. Association of mediating variable (CUSTOMER SATISFACTION) with dependent variable (FIRM PERFORMANCE) is successfully confirmed. Mediating role

of mediating variable (CUSTOMER SATISFACTION) with association between independent variable (SCM PRACTICES) and dependent variable (FIRM PERFORMANCE) is successfully confirmed. Based on these findings all the causal model relationships along with mediation role are found successful.

CONCLUSION

First objective was to find the impact of SCM practices on firm performance. This objective is achieved by regression analyses for SCM practices and firm performance. Results show that the specified relationships among all variables (including independent, dependent and mediating variables) have significant positive outcomes. Thus, regression analysis for all variables of research framework was successful.

Second objective was to find the mediating role of customer satisfaction in the relationship among SCM practices and firm performance. This objective is achieved by mediation regression analyses for mediator role of customer satisfaction with the relationship between SCM practices and firm performance. Results show that the specified direct relationships among variables (independent and dependent variables without mediating variable present) and indirect relationships among variables (independent and dependent variables with mediating variable present) have significant outcomes. Thus, mediation regression analysis for mediation role of mediating variable was successful.

Statistical results verify the importance to focus on SCM practices with the perspective of customer satisfaction in manufacturing firms to enhance the performance. This study confirms the effects of the SCM practices on the performance of the manufacturing organizations that is also mediated by customer satisfaction. Findings of this research in Pakistan may be generalized to entire manufacturing sector across the world by considering local differences from political, economic and socio-cultural aspects.

REFERENCES

- Almulhim, T., Almubarak, N., & Aljabr, N. (2024). How to Comprehensively Evaluate Firm Performance from Operational, Financial, and Sustainability Perspectives? A Two-Stage Data Envelopment Analysis Approach. *Emerging Markets Finance and Trade*, 60(7), 1447–1467.
- Ageron, B., Lavastre, O., & Spalanzani, A. (2013). Innovative supply chain practices: the state of French companies. *Supply Chain Management: An International Journal*, 18(3), 265-276.
- Banfield, E. (1999). *Harnessing value in the supply chain: Strategic sourcing in action* (Vol. 4). John Wiley & Sons.
- Bayraktar, E., Demirbag, M., Koh, S. L., Tatoglu, E., & Zaim, H. (2009). A causal analysis of the impact of information systems and SCM practices on operational performance: evidence from manufacturing SMEs in Turkey. *International Journal of Production Economics*, 122(1), 133-149.
- Beamon, B. M. (1999). Measuring supply chain performance. *International journal of operations & production management*, 19(3), 275-292.
- Berrah, L., & Clivillé, V. (2007). Towards an aggregation performance measurement system model in a supply chain context. *Computers in Industry*, 58(7), 709-719.
- Bigliardi, B., & Bottani, E. (2010). Performance measurement in the food supply chain: a balanced scorecard approach. *Facilities*, 28(5/6), 249-260.
- Blanchard, D. (2010). *SCM best practices*. John Wiley & Sons.
- Brewer, P. C., & Speh, T. W. (2000). Using the balanced scorecard to measure supply chain performance. *Journal of Business logistics*, 21(1), 75-85.

- Chae, B. (2009). Developing key performance indicators for supply chain: an industry perspective. *Supply Chain Management: An International Journal*, 14(6), 422-428.
- Chan, F. T. (2003). Performance measurement in a supply chain. *The international journal of advanced manufacturing technology*, 21(7), 534-548.
- Chan, F. T., & Qi, H. J. (2003). An innovative performance measurement method for supply chain management. *Supply chain management: An international Journal*, 8(3), 209-223.
- Chen, I. J., & Paulraj, A. (2004). Towards a theory of supply chain management: the constructs and measurements. *Journal of operations management*, 22(2), 119-150.
- Chi, C. G., & Gursoy, D. (2009). Employee satisfaction, customer satisfaction, and financial performance: An empirical examination. *International Journal of Hospitality Management*, 28(2), 245-253.
- Christopher, M. (2000). The agile supply chain: competing in volatile markets. *Industrial marketing management*, 29(1), 37-44.
- Cigolini, R., Cozzi, M., & Perona, M. (2004). A new framework for supply chain management: conceptual model and empirical test. *International Journal of Operations & Production Management*, 24(1), 7-41.
- Cuthbertson, R., & Piotrowicz, W. (2011). Performance measurement systems in supply chains: A framework for contextual analysis. *International Journal of Productivity and Performance Management*, 60(6), 583-602.
- Donlon, J. P. (1996). Maximizing value in the supply chain. *Chief Executive*, 117(1), 54-63.
- Ellinger, A. E., Daugherty, P. J., & Plair, Q. J. (1999). Customer satisfaction and loyalty in supply chain: the role of communication. *Transportation Research Part E: Logistics and Transportation Review*, 35(2), 121-134.
- Ellinger, A., Shin, H., Magnus Northington, W., Adams, F. G., Hofman, D., & O'Marah, K. (2012). The influence of SC competency on customer satisfaction and shareholder value. *Supply Chain Management: An International Journal*, 17(3), 249-262.
- Fawcett, S. E., Magnan, G. M., & McCarter, M. W. (2008). Benefits, barriers, and bridges to effective supply chain management. *Supply Chain Management: An International Journal*, 13(1), 35-48.
- Gimenez, C., van der Vaart, T., & Pieter van Donk, D. (2012). Supply chain integration and performance: the moderating effect of supply complexity. *International Journal of Operations & Production Management*, 32(5), 583-610.
- Golicic, S. L., & Smith, C. D. (2013). A meta-analysis of environmentally sustainable SCM practices and firm performance. *Journal of supply chain management*, 49(2), 78-95.
- Gomes, C. F., Yasin, M. M., & Lisboa, J. V. (2006). Performance measurement practices in manufacturing firms: an empirical investigation. *Journal of Manufacturing Technology Management*, 17(2), 144-167.
- Govindan, K., Azevedo, S. G., Carvalho, H., & Cruz-Machado, V. (2014). Impact of SCM practices on sustainability. *Journal of Cleaner Production*, 85, 212-225.
- Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004). A framework for supply chain performance measurement. *International journal of production economics*, 87(3), 333-347.
- Gunasekaran, A., Patel, C., & Tirtiroglu, E. (2001). Performance measures and metrics in a supply chain environment. *International journal of operations & production Management*, 21(1/2), 71-87.

- Handfield, R. B., & Bechtel, C. (2002). The role of trust and relationship structure in improving supply chain responsiveness. *Industrial marketing management*, 31(4), 367-382.
- Haque, M., & Islam, R. (2013). Effects of SCM practices on customer satisfaction: Evidence from pharmaceutical industry of Bangladesh. *Global Business and Management Research*, 5(2/3), 120.
- Heikkilä, J. (2002). From supply to demand chain management: efficiency and customer satisfaction. *Journal of operations management*, 20(6), 747-767.
- Hervani, A. A., Helms, M. M., & Sarkis, J. (2005). Performance measurement for green supply chain management. *Benchmarking: An international journal*, 12(4), 330-353.
- Heskett, J.L., Jones, T.O., Loveman, G.W., Sasser, W.E., Schlesinger, L.A., 1994. Putting the service-profit chain to work. *Harvard Business Review* 72 (2), 164-175.
- Huo, B. (2012). The impact of supply chain integration on company performance: an organizational capability perspective. *Supply Chain Management: An International Journal*, 17(6), 596-610.
- Ip, W. H., Chan, S. L., & Lam, C. Y. (2011). Modeling supply chain performance and stability. *Industrial Management & Data Systems*, 111(8), 1332-1354.
- Jacobs, M. A., Yu, W., & Chavez, R. (2016). The effect of internal communication and employee satisfaction on supply chain integration. *International Journal of Production Economics*, 171, 60-70.
- Kassinis, G.I., & Soteriou, A.C. (2003). Greening the service profit chain: the impact of environmental management practices. *Production and Operations Management*, 12(3), 386-403.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educ Psychol Meas.*
- Kurata, H., & Nam, S. H. (2010). After-sales service competition in a supply chain: Optimization of customer satisfaction level or profit or both?. *International Journal of Production Economics*, 127(1), 136-146.
- Lai, K. H., Ngai, E. W. T., & Cheng, T. C. E. (2004). An empirical study of supply chain performance in transport logistics. *International journal of Production economics*, 87(3), 321-331.
- Laosirihongthong, T., Adebajo, D., & Choon, T., K. (2013). Green SCM practices and performance. *Industrial Management & Data Systems*, 113(8), 1088-1109.
- Lee, H. L. (2000). Creating value through supply chain integration. *Supply Chain Management Review*, 4(4), 30-36.
- Lenny Koh, S. C., Demirbag, M., Bayraktar, E., Tatoglu, E., & Zaim, S. (2007). The impact of SCM practices on performance of SMEs. *Industrial Management & Data Systems*, 107(1), 103-124.
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. S. (2006). The impact of SCM practices on competitive advantage and organizational performance. *Omega*, 34(2), 107-124.
- Li, S., Rao, S. S., Ragu-Nathan, T. S., & Ragu-Nathan, B. (2005). Development and validation of a measurement instrument for studying SCM practices. *Journal of operations management*, 23(6), 618-641.
- Lin, C., Chow, W. S., Madu, C. N., Kuei, C. H., & Yu, P. P. (2005). A structural equation model of supply chain quality management and organizational performance. *International journal of production economics*, 96(3), 355-365.
- Liu, H., Ke, W., Wei, K. K., & Hua, Z. (2013). The impact of IT capabilities on firm performance: The mediating roles of absorptive capacity and supply chain agility. *Decision Support Systems*, 54(3), 1452-1462.

- Marwah, A. K., Thakar, G., & Gupta, R. C. (2014). Determinants of Supply Chain Performance of Indian Manufacturing Organizations. *International Journal of Business Research and Management*, 5(1), 14-27.
- Mishra, P. K., & Shekhar, B. R. (2013). Consumer behavior, customer satisfaction vis-a-vis brand performance: an empirical study of dairy food supply chain in India. *International Journal of Indian Culture and Business Management*, 7(3), 399-412.
- Mohanty, R. P., & Prakash, A. (2014). Green SCM practices in India: an empirical study. *Production Planning & Control*, 25(16), 1322-1337.
- Morali, O., & Searcy, C. (2013). A review of sustainable SCM practices in Canada. *Journal of Business Ethics*, 117(3), 635-658.
- Naknok, S. (2022). Firm Performance Indicators as a Fundamental Analysis of Stocks and a Determinant of a Firm's Operation. *International Journal of Economics and Business Administration*, X (1), 190-213.
- Politis, Y., Giovanis, A., & Binioris, S. (2014). Logistics service quality and its effects on customer satisfaction in the manufacturing companies' supply chains: Empirical evidence from Greece. *Journal of Modelling in Management*, 9(2), 215-237.
- Prajogo, D., & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. *International Journal of Production Economics*, 135(1), 514-522.
- Rungtusanatham, M., Salvador, F., Forza, C., & Choi, T. Y. (2003). Supply-chain linkages and operational performance: A resource-based-view perspective. *International Journal of Operations & Production Management*, 23(9), 1084-1099.
- Shepherd, C., & Günter, H. (2006). Measuring supply chain performance: current research and future directions. *International Journal of Productivity and Performance Management*, 55(3/4), 242-258.
- Stentoft Arlbjørn, J., & Lüthje, T. (2012). Global operations and their interaction with supply chain performance. *Industrial Management & Data Systems*, 112(7), 1044-1064.
- Swafford, P. M., Ghosh, S., & Murthy, N. (2006). The antecedents of supply chain agility of a firm: scale development and model testing. *Journal of Operations Management*, 24(2), 170-188.
- Tan, K. C. (2001). A framework of SCM literature. *European Journal of Purchasing & Supply Management*, 7(1), 39-48.
- 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.
- Thakkar, J., Kanda, A., & Deshmukh, S. G. (2009). Supply chain performance measurement framework for small and medium scale enterprises. *Benchmarking: An International Journal*, 16(5), 702-723.
- Tipu, S. A. A., & Fantazy, K. A. (2014). Supply chain strategy, flexibility, and performance: a comparative study of SMEs in Pakistan and Canada. *The International Journal of Logistics Management*, 25(2), 399-416.
- Tracey, M., Lim, J. S., & Vonderembse, M. A. (2005). The impact of supply-chain management capabilities on business performance. *Supply Chain Management: An International Journal*, 10(3), 179-191.
- Van Der Vorst, J. G. (2006). *Performance measurement in Agri-food supply-chain networks. In quantifying the agri-food supply chain* (pp. 15-26). Springer Netherlands.

- Van Hoek, R. I. (1998). "Measuring the unmeasurable"-measuring and improving performance in the supply chain. *Supply Chain Management: An International Journal*, 3(4), 187-192.
- Voudouris, V. T., & Consulting, A. (1996). Mathematical programming techniques to debottleneck the supply chain of fine chemical industries. *Computers & chemical engineering*, 20, S1269-S1274.
- Wiengarten, F., Humphreys, P., Cao, G., Fynes, B., & McKittrick, A. (2010). Collaborative supply chain practices and performance: exploring the key role of information quality. *Supply Chain Management: An International Journal*, 15(6), 463-473.
- Wisner, J. D. (2003). A structural equation model of SCM strategies and firm performance. *Journal of Business Logistics*, 24(1), 1-26.
- Wolf, J. (2014). The relationship between sustainable supply chain management, stakeholder pressure and corporate sustainability performance. *Journal of business ethics*, 119(3), 317-328.
- Wu, F., Yenyurt, S., Kim, D., & Cavusgil, S. T. (2006). The impact of information technology on supply chain capabilities and firm performance: A resource-based view. *Industrial Marketing Management*, 35(4), 493-504.
- Yu, W., Jacobs, M. A., Salisbury, W. D., & Enns, H. (2013). The effects of supply chain integration on customer satisfaction and financial performance: An organizational learning perspective. *International Journal of Production Economics*, 146(1), 346-358.