



Effects of Supply Chain Agility on Customer Satisfaction and Financial Performance of SMEs in Pakistan

Muhammad Asif khan

School of Management, Huazhong University of Science and Technology Wuhan, China

Marium Ata

Electrical Engineering department, Usman University of Technology
mariamata@hotmail.com

Imdad Hussain Siddiqui

PhD Scholar in Business Administration, IBA, University of Sindh, Jamshoro, Pakistan & Director, Climate & Disaster Justice Unit Office of the Provincial Ombudsman Sindh, Pakistan
is.mpa.hr@gmail.com

Abstract

Young ventures frequently operate with limited capital, informal routines, and weak bargaining power, making disciplined supply chain processes potentially important for market survival. This study reassesses the relationship between Supply Chain Operations Reference (SCOR)-based practices and three dimensions of early-stage venture performance in Pakistan: financial performance, customer satisfaction, and service level. A quantitative, cross-sectional survey was administered online to startup and small-business operators. Of 55 responses received, 50 valid cases were retained. The instrument measured the combined practices of planning, sourcing, making, delivery, and returns, together with the three performance outcomes. Internal consistency was acceptable for all constructs (Cronbach's $\alpha = .747-.888$). Pearson correlations and simple linear regressions were used for analysis.

The combined SCOR score was weakly and nonsignificantly associated with financial performance ($r = .219$, $R^2 = .048$, $\beta = .219$, $t = 1.552$, $p = .127$). In contrast, SCOR practices were positively associated with customer satisfaction ($r = .591$, approximately 34.9% shared variance, $t = 5.081$, $p < .001$) and service level ($r = .542$, $R^2 = .294$, $\beta = .542$, $t = 4.466$, $p < .001$). At the process level, sourcing was the only SCOR component significantly related to financial performance ($r = .303$, $p = .033$), whereas all five components were associated with customer satisfaction and service level to varying degrees. The findings suggest that operational discipline may be reflected first in customer-facing outcomes, while financial benefits may be delayed, indirect, or obscured by the cost and volatility experienced by young firms. Because the sample is small and nonprobabilistic, the results should be treated as exploratory rather than nationally representative or causal.

Keywords: SCOR model; supply chain processes; startups; customer satisfaction; service level; financial performance; Pakistan



Introduction

Startups and small firms contribute to employment, experimentation, and market renewal, but their operating environments are often characterized by demand uncertainty, cash constraints, limited specialist expertise, and fragile supplier relationships. These constraints are especially consequential in emerging markets, where infrastructure gaps and institutional uncertainty can amplify delays, quality variability, and procurement risk. A commercially promising idea can therefore underperform when the venture cannot translate demand into reliable planning, sourcing, production or service preparation, delivery, and returns.

Supply chain management offers a process perspective for addressing this execution challenge. Rather than viewing procurement, production, logistics, and customer service as isolated functions, supply chain management coordinates flow of materials, services, information, and funds across interconnected actors (Mentzer et al., 2001). The SCOR framework organizes these activities around core processes—plan, source, make, deliver, and return—and connects them to performance attributes and metrics. Contemporary research continues to show that process maturity and information-system support can strengthen supply chain performance in emerging-market settings (Benrqa et al., 2024). Digitalization may also improve performance through stronger resilience and process visibility (Zhao et al., 2023).

The relationship between operational practice and startup performance, however, is not necessarily immediate or uniform. Customer satisfaction and service level can respond relatively quickly to product availability, delivery reliability, and a workable return process. Financial performance may take longer to improve because operational investments create costs before they generate scale, learning, or repeat purchases. Recent scholarship also notes that the interface between entrepreneurship and supply chain management remains dispersed and underdeveloped, despite the operational dependence of young firms on external partners (Zhuang, 2024).

This study revisits survey evidence from 50 early-stage ventures in Pakistan. It makes three contributions. First, it uses a SCOR-based lens to examine operational discipline in a resource-constrained entrepreneurial context. Second, it distinguishes financial performance from customer satisfaction and service level rather than collapsing them into one outcome. Third, it corrects and clarifies the statistical interpretation of the original analysis, including the meaning of R^2 , p values, and standardized associations.

Research Questions and Hypotheses

RQ1. How are SCOR practices combined with the financial performance of early-stage ventures?

RQ2. How are combined SCOR practices associated with customer satisfaction?



RQ3. How are combined SCOR practices associated with service level?

H1. Combined SCOR practices are positively associated with financial performance.

H2. Combined SCOR practices are positively associated with customer satisfaction.

H3. Combined SCOR practices are positively associated with service level.

Literature Review and Conceptual Development

Supply Chain Management in Young Firms

Young firms rarely control an entire value chain. Their performance depends on suppliers, logistics providers, digital platforms, contractors, and customers whose decisions lie outside the focal venture. This dependence makes coordination capability particularly important. Supply chain management seeks to align these actors and activities with end-customer needs, while reducing avoidable time, cost, uncertainty, and duplication (Jüttner et al., 2010; Mentzer et al., 2001). Research at the entrepreneurship–supply chain interface suggests that entrepreneurial firms require both opportunity-seeking flexibility and disciplined interorganizational execution (Ketchen & Craighead, 2020; Zhuang, 2024).

SMEs face distinctive barriers: limited purchasing leverage, thin management capacity, insufficient data, and difficulty financing inventory or technology. Yet small size can also support rapid decisions and close customer contact. The managerial challenge is to formalize essential processes without creating bureaucracy that overwhelms the venture. A SCOR-based diagnostic is useful in this regard because it turns an abstract supply chain into a small number of recurring processes that can be monitored and improved.

The SCOR Process Lens

Plan. Planning translates expected demand into resource, capacity, inventory, and supplier decisions. For startups, even simple forecasts and reorder rules can reduce stockouts, excess inventory, and emergency purchasing. Planning also establishes the assumptions against which actual performance can be reviewed.

Source. Sourcing includes supplier identification, evaluation, selection, ordering, receipt, and collaboration. Cost matters, but supplier quality, reliability, flexibility, lead time, and communication may be equally important. These decisions can directly influence margins because young firms often lack the volume needed to absorb procurement errors.

Make. The make process covers the transformation or preparation of products and services, including scheduling, quality control, packaging, and management of work in process.



Standardization and basic quality routines can reduce rework while protecting the venture's value proposition.

Deliver: Delivery involves order management, fulfillment, warehousing, transportation, and customer communication. Reliability and responsiveness are highly visible to customers; a correct product delivered on time can strengthen confidence even when the venture is relatively unknown.

Return. Returns and reverse flows include complaint handling, replacement, refund, recovery, and disposition. A transparent and responsive return process can reduce perceived purchase risk and preserve customer relationships, although it also creates cost and operational complexity.

Performance as a Multidimensional Outcome

Supply chain performance cannot be represented adequately by one financial measure. A comprehensive assessment should distinguish economic results from operational and customer outcomes. Financial measures remain necessary, but they can lag behind process improvements and may be affected by pricing, market growth, financing costs, and owner decisions unrelated to the supply chain (Rahiminezhad Galankashi & Mokhtab Rafiei, 2021). Customer satisfaction reflects the extent to which the offering and experience meet expectations, whereas service level captures availability, fulfillment, lead time, accuracy, and responsiveness.

This distinction is especially important for startups. An investment in better packaging, an additional supplier, inventory buffers, or a customer-friendly return policy may improve satisfaction and continuity before it improves profit. Sustainability-oriented supply chain practices can also strengthen SME reputation, loyalty, and broader performance, but the mechanisms and time horizons vary across outcomes (Türkeş et al., 2024). The present model therefore treats financial performance, customer satisfaction, and service level as separate dependent variables.

Hypothesis Rationale

SCOR practices should support financial performance when better planning reduces waste, sourcing lowers total acquisition cost, making improvements in productivity, delivery limits failure costs, and returns value. However, the relationship may be weakened by startup investment needs and short operating histories. H1 therefore tests whether the aggregate operational pattern is visible in current financial results.

Customer satisfaction is expected to improve when demand is anticipated, inputs are dependable, output meet specifications, deliveries are timely, and returns are handled fairly. These processes collectively reduce customer effort and perceived risk. H2 tests this customer-facing relationship. Service level should likewise benefit from coordination across availability, capacity, fulfillment,



information, and recovery processes. H3 tests whether stronger overall SCOR practice is associated with more reliable service.

Research Methodology

Research Design

The study used positive, quantitative, cross-sectional survey design. This design permits estimation of associations among measured constructs at one point in time, but it does not establish temporal precedence or causation. The unit of analysis was the participating startup or small business, represented by one respondent familiar with its operations.

Population, Sample, and Data Collection

The intended population was startups and small businesses operating in Pakistan. Because no complete national sampling frame was available, the study used nonprobability convenience sampling. A Google Forms questionnaire was circulated through virtual communities serving small-business operators. Fifty-five responses were received; five were excluded as invalid, leaving 50 usable cases. The sample is therefore informative about the participating ventures but should not be treated as statistically representative of all Pakistani startups.

Measures

The questionnaire used adapted items from earlier supply chain and performance research. Twenty items assessed the combined SCOR processes of plan, source, make, deliver, and return. Financial performance, customer satisfaction, and service level were each measured with four items. Operational-practice responses used a five-point agreement scale. The source manuscript reports a five-point performance scale but describes its direction inconsistently; the final authors should verify the coding and confirm that any reverse-scored items were handled correctly before publication.

Table 1

Construct structure and measurement

SCOR practices	Independent variable	20	Five-point agreement scale
Financial performance	Dependent variable	4	Five-point performance scale
Customer satisfaction	Dependent variable	4	Five-point performance scale
Service level	Dependent variable	4	Five-point performance scale



Analytical Strategy

SPSS was used for descriptive statistics, Cronbach's alpha, Pearson correlations, and simple linear regression. Statistical significance was evaluated at $\alpha = .05$. For clarity, values originally shown as $p = .000$ are reported as $p < .001$. R^2 is interpreted as the proportion of variance in an outcome accounted for by the predictor in the sample. Because each hypothesis uses one predictor, the standardized regression coefficient equals the corresponding bivariate correlation. No multivariable controls, diagnostic statistics, confidence intervals, or common-method assessments were available in the source manuscript.

Results

Sample Profile

Women represented 54% of respondents and men 46%. Most respondents were younger than 30 years (66%). Seventy-two percent of ventures had operated for one or two years, 82% had one or two founders, and 76% employed fewer than 20 people. Karachi accounted for 46% of the sample. Art, culture, and tourism was the largest industry category (30%), followed by retail and the residual "other" category (16% each).

Table 2

Respondent and venture characteristics (N = 50)

Characteristic	Category	n	%
Gender	Male	23	46
	Female	27	54
Respondent age	18–24	15	30
	25–29	18	36
	30–35	13	26
	36 or older	4	8
Venture age	1 year	18	36
	2 years	18	36
	3 years	5	10
	More than 3 years	9	18
Number of founders	1	17	34
	2	24	48
	3	8	16



	More than 3	1	2
Number of employees	1–4	20	40
	5–19	18	36
	20–50	8	16
	More than 50	4	8

Table 3

Geographic and industry composition (N = 50)

Dimension	Category	n	%
Location	Faisalabad, Punjab	1	2
	Hyderabad, Sindh	4	8
	Islamabad	6	12
	Karachi, Sindh	23	46
	Lahore, Punjab	10	20
	Multan, Punjab	1	2
	Peshawar, Khyber Pakhtunkhwa	2	4
	Quetta, Balochistan	1	2
	Rawalpindi, Punjab	1	2
	Sukkur, Sindh	1	2
Industry	Manufacturing	5	10
	Other	8	16
	Financial services	1	2
	Health	3	6
	Transportation	2	4
	Education	2	4
	Art, culture, and tourism	15	30
	IT support services	1	2



Media	5	10
Retail	8	16

Note. The source table assigned Islamabad and Sukkur to incorrect provinces. Their geographic labels have been standardized here; authors should verify the raw categories and coding.

Reliability

All four scales exceeded the commonly used .70 threshold for exploratory research. The combined SCOR scale demonstrated the highest internal consistency ($\alpha = .888$), followed by financial performance ($\alpha = .858$), service level ($\alpha = .757$), and customer satisfaction ($\alpha = .747$). These results support internal consistency but do not establish construct validity or dimensionality.

Table 4

Internal consistency of study constructs

Construct	Cronbach's α	Number of items	Interpretation
SCOR practices	.888	20	Good
Financial performance	.858	4	Good
Customer satisfaction	.747	4	Acceptable
Service level	.757	4	Acceptable

Tests of the Hypotheses

H1 was not supported. Aggregate SCOR practice had a weak positive relationship with financial performance, but the association was not statistically significant ($r = .219$, $\beta = .219$, $t = 1.552$, $p = .127$). The regression accounted for 4.8% of the variance in financial performance ($R^2 = .048$; adjusted $R^2 = .028$; $F [1, 48] = 2.408$). This corrects the source manuscript's interpretation of .048 as 0.48%.

H2 was supported. SCOR practice was moderately and positively related to customer satisfaction ($r = .591$, $t = 5.081$, $p < .001$). In a one-predictor model, this correlation corresponds to approximately 34.9% explained variance ($R^2 \approx .349$). The customer-satisfaction regression table was not included in the source document, so this R^2 is transparently derived from the reported correlation and should be verified against the original SPSS output.



H3 was supported. SCOR practice was positively related to service level ($r = .542$, $\beta = .542$, $t = 4.466$, $p < .001$). The reported model explained 29.4% of service-level variance ($R^2 = .294$; adjusted $R^2 = .279$; $F [1, 48] = 19.941$).

Table 5
Summary of hypothesis tests

Hypothesis	Outcome	r / β	R^2	t	p	Decision
H1	Financial performance	.219	.048	1.552	.127	Not supported
H2	Customer satisfaction	.591	$\approx .349$	5.081	$< .001$	Supported
H3	Service level	.542	.294	4.466	$< .001$	Supported

Note. For these one-predictor models, standardized β equals r . The H2 R^2 is reconstructed as r^2 because the corresponding model-summary table was absent from the source file.

Process-Level Associations

The component analysis provides a more differentiated picture. Sourcing was the only process significantly associated with financial performance ($r = .303$, $p = .033$). All five processes were associated with customer satisfaction, with delivery showing the strongest relationship ($r = .529$, $p < .001$). All five were also associated with service level; return ($r = .571$, $p < .001$) and make ($r = .500$, $p < .001$) were the strongest. These bivariate patterns are descriptive and should not be interpreted as independent effects because the SCOR components were intercorrelated.

Table 6
Correlations between SCOR components and venture outcomes

SCOR process	Financial performance	Customer satisfaction	Service level
Plan	.231 (.107)	.432 (.002)	.313 (.027)
Source	.303 (.033)	.405 (.004)	.322 (.023)
Make	.085 (.556)	.379 (.007)	.500 ($< .001$)
Deliver	.169 (.242)	.529 ($< .001$)	.315 (.026)
Return	-.035 (.808)	.444 (.001)	.571 ($< .001$)



Note. Entries are Pearson r values with two-tailed p values in parentheses.

Discussion and Conclusion

Discussion

The study's central result is the contrast between customer-facing and financial outcomes. Stronger SCOR practice was associated with customer satisfaction and service level, but not with financial performance. This pattern is plausible for young firms because operational discipline first changes what customers experience: product availability, order accuracy, delivery reliability, communication, and recovery from failure. Financial outcomes depend on these experiences but also on pricing, demand growth, fixed costs, financing conditions, owner withdrawals, and the time required for repeat purchasing to emerge.

The finding for customer satisfaction supports the demand-oriented logic of supply chain management. Planning and sourcing help make the required product available; making protects quality; delivery shapes convenience and reliability; and returns reduce the perceived risk of purchase. Delivery produced the largest component correlation with satisfaction, suggesting that execution at the customer interface may be especially visible in this sample. The result is consistent with Heikkilä's (2002) argument that supply and demand processes should be integrated around customer value.

Service level was also strongly associated with combined SCOR practice. At the component level, return and make showed the strongest relationships. This may indicate that service is judged not only by speed but also by the venture's ability to provide a dependable offering and resolve problems after delivery. Process maturity research in an emerging economy similarly finds that more developed supply chain processes improve performance and that information-system support strengthens this relationship (Benrqa et al., 2024). For small firms, even modest digital tools for inventory visibility, order tracking, and supplier communication may improve consistency; broader evidence links supply chain digitalization with resilience and performance through multiple pathways (Zhao et al., 2023).

The absence of a significant aggregate relationship with financial performance should not be read as evidence that supply chain practice is financially irrelevant. First, the sample of 50 offers limited statistical power for weak effects. Second, the participating ventures were young: 72% had operated for no more than two years. Third, the overall SCOR score may combine processes with different financial consequences. Sourcing alone was significantly related to financial performance, which is consistent with its direct connection to purchase price, supplier terms, outsourcing, quality failure, and inventory cost. Finally, financial performance measures often



require a wider set of indicators and a longer time horizon than customer or operational metrics (Rahiminezhad Galankashi & Mokhtab Rafiei, 2021).

The study also illustrates why supply chain performance should be treated as multidimensional. If only current financial results were examined, the customer and service benefits would be missed. If only satisfaction were examined, the cost of producing that satisfaction would remain unknown. Startup managers therefore need a balanced set of indicators that connect process discipline to reliability, responsiveness, cost, cash, and customer outcomes.

Managerial Implications

Begin with a minimum viable operating system. Young firms do not need a complex corporate supply chain architecture. They need explicit demand assumptions, supplier criteria, basic quality checks, order-status visibility, delivery commitments, and a clear return procedure.

Manage sourcing for total value. Because sourcing was the only component associated with financial performance, founders should compare suppliers on total acquisition cost, reliability, flexibility, minimum order quantities, payment terms, and defect risk rather than unit price alone.

Measure the customer-facing chain. Startups should monitor fill rate, on-time delivery, order accuracy, complaints, return cycle time, and repeat purchase alongside revenue and margin. These indicators can reveal operational improvement before it appears in profit.

Use simple digital visibility. Shared inventory records, supplier scorecards, order dashboards, and automated customer updates can reduce information delays. Digital tools should be chosen for a defined process problem rather than adopted as an end in themselves.

Review processes as the venture grows. Routines suitable for ten orders per week may fail to reach one hundred. Founders should periodically reassess capacity, supplier dependence, fulfillment design, return costs, and decision ownership.

Limitations and Future Research

The findings are subject to important limitations. Convenience sampling and online distribution create selection bias and prevent national generalization. The sample is small, geographically concentrated, and heterogeneous across industries. All variables were collected from one respondent at one time, increasing common-method risk. The design is cross-sectional, so direction and causation cannot be established. Construct validity, item loadings, confidence intervals, regression diagnostics, and control variables were not reported. The direction of the performance response scale is described inconsistently in the source manuscript and requires verification. The missing SPSS model table for customer satisfaction should also be recovered.



Future research should use larger, stratified samples and distinguish startups by industry, age, business model, and growth stage. Longitudinal designs could test whether customer and service improvements precede financial gains. Multivariable models should examine the five SCOR processes simultaneously while controlling size, age, industry, location, digital capability, and environmental uncertainty. Objective indicators—revenue growth, gross margin, order accuracy, on-time delivery, inventory turnover, return rate, and customer retention—would strengthen inference. Researchers could also test mediation through resilience, agility, or customer loyalty and examine whether digital systems or supplier collaboration amplify the value of process maturity.

Conclusion

This exploratory study indicates that disciplined supply chain processes are more clearly reflected in customer satisfaction and service level than in the current financial performance of participating Pakistani startups. The evidence does not support a direct aggregate financial effect, although sourcing shows a modest relationship with financial outcomes. These results encourage founders to view operational discipline as a foundation for dependable customer value while recognizing that profitability depends on additional strategic, market, and financial conditions. The practical message is measured rather than absolute: build transparent and repeatable plan–source–make–deliver–return routines, track both customer and financial indicators, and revise the operating system as the venture develops.

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