“Stimulators of third-party logistics performance of supply chains in the Nigerian manufacturing industry”

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STIMULATORS OF THIRD-PARTY LOGISTICS PERFORMANCE OF SUPPLY CHAINS IN THE NIGERIAN MANUFACTURING INDUSTRY

Abstract

The COVID-19 disruption of supply chains has motivated manufacturing companies in Nigeria to build and maintain supply chain visibility, robustness, and resilience to remain third-party logistics providers. It is vital to have an adequate understanding of third-party logistics performance drivers. Most studies have concentrated on third-party logistics capability, while few others explored the impact of relational governance structures on performance. However, studies examining the synergy between third-party logistics capability and relationship management are scarce. The purpose of this study is to investigate the stimulators of third-party logistics performance in the Nigerian manufacturing industry. A descriptive survey, e-mail questionnaire, and PLS-SEM approach was used to collect and analyze the data from a sample of 364 manufacturing companies in Nigeria. The findings indicated that relationship management has a significant positive association with third-party logistics capability ($\beta = 0.785$, $t = 3.457$, $p < 0.001$); relationship management has a significant negative association with supply chain risk ($\beta = -0.209$, $t = 4.149$, $p < 0.001$); third-party logistics capability has a significant negative association with supply chain risk ($\beta = -0.620$, $t = 3.199$, $p < 0.001$); supply chain risk has a significant negative association with logistics performance ($\beta = -0.695$ $t = 5.396$, $p < 0.001$). Hence, relationship management, third-party logistics capability, and supply chain risk are drivers of third-party logistics performance. Therefore, supply chain partners should manage their relationships to strengthen third-party logistics capability and reduce all kinds of uncertainties and risks.

Keywords supply chain, management, capability, relationship, uncertainty, risk, resilience

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INTRODUCTION

Companies had always been overstretched by unexpected environmental pressure (forces), in which those who survive their crisis moments have become victors by judiciously and proactively tackling them head-on. Veraciously, the COVID-19 pandemic is one of such crises that immensely challenged many organizations and caused a lot of cataclysm in their supply value chain. Interestingly, companies had strategically leveraged on their internal capacity to develop emergency plans to deal with ugly situations that guaranteed the free conveyance of raw materials and processed goods from the factories to different consumer destinations. Incidentally, large number of global national and multinational companies have either encountered or witnessed drastic supply chain disruptions sequel to the evolution of the COVID-19 pandemic across the globe. The Institute for Supply Management (2021) revealed that due to the COVID-19 pandemic, production capacity, supply availability, transportation network, and

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lead time were disastrously shattered. In truism and technically, supply chain uncertainty created by COVID-19 was highly unimaginable, leading to the disintegration of demand and supply trends that eventually culminated in the total shutdown of the entire global supply chains.

Considering the new economic environment and elevated supply chain uncertainty and risk, manufacturers in Nigeria switched to third-party logistics (3PL) providers as key players in their supply chains to build and maintain supply chain visibility, robustness, and resilience capabilities for recovering from disruptions. These expectations can be undermined by a lack of understanding of the 3PL performance drivers involved in managing their partners.

Hence, most studies on third-party logistics have concentrated on 3PL capability, while few others have examined the impacts of relational governance structures on performance. However, studies examining the synergy between 3PL capability and relationship management in mitigating supply chain uncertainty and risk to improve logistics performance are scarce. Thus, there is a need to analyze this interesting and thought evoking research topic.

1. LITERATURE REVIEW

Physical distribution is an indispensable part of the marketing mix. Similarly, making goods and services available is one of the cardinal appendages of fulfilling consumer satisfaction. However, the movement (from the factory) and availability of goods and services to the consumer had been a great challenge to distribution and marketing. Incidentally, the noteworthy consequence of COVID-19 unprecedented disruption of global supply chains is that supply chain management has become more complex and professional (Du et al., 2023). The worldwide trend in globalization and the increased global supply chain uncertainty and risk have led firms to engage third parties in their logistics tasks (Mageto, 2022). Third-party logistics (3PL) entail using companies other than the mother company to naturally resolve logistics problems ordinarily handled within an organization. 3PL providers interface with different supply chain entities by equipping them with information technologies and systems (Ahimbisibwe et al., 2016).

Interestingly, the job of 3PL is dependent on the idea of bundling resources where those resources owned by 3PL providers and other supply chain networks are synergistically bonded to form such capabilities as creativity, responsibility, and flexible operations. Regrettably, low visibility was marred by the pandemic that dislocated the process of material supply and delivery for many companies and organizations, hence nibbling away at their profitability (Yang et al., 2021).

Mohr and Spekman (1994) define supply chain visibility as the message received by supply chain members concerning planning, control, and management of demand and supply. As a major actor in supply chain performance improvement, as well as in actualizing analytical capabilities, supply chain visibility has, in recent years, been attracting significant attention and gaining high recognition (Bechtsis et al., 2022). However, due to inadequate implementation, supply chain practitioners are yet to gain absolute visibility (Kalaiarasan et al., 2023). Ming et al. (2021) and Juan et al. (2022) emphasize that supply chain visibility positively affects robustness. Besides, robustness is the power of a system to remain unflappable against any internal and external distortions (Monostori, 2018). Kitano (2004) remarks that the supply chain's capacity to maintain its crucial role despite all pressure and disruptions is supply chain robustness. Coincidentally, supply chain robustness is a significant tentacle of supply chain resilience (Durach et al., 2015). Subsequently, resilience is supply chain's management capacity to recuperate to normalcy or regain equilibrium after encountering erratic disruptions (Ming et al., 2021). Incidentally, companies can return to their pre-disruption situation through resilience (Ming et al., 2021; Dickens et al., 2023).

Nevertheless, as all potential disruptions can be averted, the main task of supply chain resilience is to bounce back from disruptions (Hohenstein et al., 2015). Xu et al. (2020) observe that it is impossible to foresee every disruption, thus enjoining

firms to have mitigation plans by developing robust and resilient supply chains. The 3PL providers can design visibility, robustness, and resilience into the supply chain to avoid and absorb external threats.

In addition, supply chain management involves the management of major businesses that make products, services, and information available to all stakeholders by adding value through satisfaction and relationship between all members of the supply chain (Council of Supply Chain Management Professionals, 2011). Logistics outsourcing represents a process that selects capable 3PL providers and manages relationships (Girma & Gorg, 2004) to mitigate supply chain uncertainty and risk toward improving logistics performance.

Liu and Lyons (2011) remark that performance positively correlates with logistics capabilities. Targeting Pakistan, Aziz et al. (2020) revealed that logistics capability positively influenced manufacturing companies' performance. In a similar vein, logistics outsourcing was impacted by logistics capability. IT capability affects the firms' critical logistics decisions, hence leveraging their engagement in outsourcing to third party organizations (Ahimbisibwe et al., 2016). Ahimbisibwe et al. (2016) affirm that IT is one of those critical weapons that enliven the logistics processes.

Further, 3PL capability is derived from 3PL providers' supply chain robustness and resilience practices (El Baz & Ruel, 2021). 3PL providers are involved in many networks, collaborations, flexible operations, information sharing, and reconfiguration of resources. Platform-based asset sharing and cooperation, which entail sharing logistics assets and infrastructures among several 3PL providers, increase capacity utilization and thus reduce costs (Deutsche Post DHL Group, 2016). Darko and Vlachos (2022) identify communication and knowledge sharing as crucial for success. Ponomarov and Holcomb (2009) add that information sharing can help mitigate future risks and maintain robustness and resilience.

Lu and Yang (2010) identify innovation, responsiveness, and flexible operations as the three capabilities in the logistics industry. Innovation refers to adjusting the products following the transfer of new information to obtain a competitive advantage (Yang, 2012). It is useful for mitigating supply chain uncertainty and risk (Hellstrom & Nilsson, 2011). Yang (2012) adds that as a critical business function and one of the essential logistics capabilities, responsiveness is an element of customer service. Finally, flexibility refers to an organization's rapid reaction to changes (Naim et al., 2010).

Risks and disruptions in the global supply chain are constantly emerging (Choudhary et al., 2023; Sharma et al., 2023). Unfortunately, the world is overloaded with uncertainties coupled with supply chain intricacies that consistently expose the vulnerability of the chain (de Oliveira et al., 2018). Uncertainties are caused by variabilities or lack of information about the surroundings or other factors affecting organizational performance; risks in the business refer to abnormal changes that may affect performance (Miller, 1992). Choudhary et al. (2023) admonish that within the supply chain-domain, some specific environmental risks that constitute the source of supply chain risks, such as loss of biodiversity and climate issues, must be addressed.

Fortunately, many strategies are required to achieve a hitch-free movement of offerings from the center to end users (Awino, 2011). Indubitably, boosting logistics performance is a veritable strategy for enhancing the growth and survival of manufacturing firms (Abdul et al., 2019). Coincidently, Abdul et al. (2019) affirm that the goal attainment of logistics performance relies on the information-sharing capability of a firm. Shikur (2022) revealed that logistics performance has positive effects on economic growth. Panayides and So (2005) maintain that logistics can enhance business competitiveness by showcasing a firm's leadership by rendering experiential services to customers and cost-efficient operations. Superior customer service and lower costs of doing business will generate customer satisfaction which, in turn, will beget competitive advantage. Thus, customer service improvements and cost reduction are the primary logistics performance measures (Butrina et al., 2017). Schramm-Klein and Morschett (2006) claim that marketing performance is affected by logistics performance. Green Jr et al. (2008) empirically revealed that supply chain management strategy positively impacted logistics performance.

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They also indicated that logistics performance positively influenced marketing performance. The reasons for an organization to outsource its logistics functions are grounded in many theories.

The resource-dependency theory gives insights into organizational responses to supply chain disruptions (Bode et al., 2011). In enhancing supply chain effectiveness and efficiency through 3PL, firms rely on outside suppliers to gain a competitive advantage (Etokudoh et al., 2017). Organizations unite to build a sustainable alliance toward garnering knowledge and resources from other business associates (Fynes et al., 2008). To buttress this, Kim et al. (2020) assert that the resource-dependency theory suggests that firms exist interdependently (side by side) to reap the benefits of sharing their assets. As a matter of fact, "no man is an Island" (Okolo et al., 2016) is a dictum, and as such, achieving sustainable competitive advantage in the modern business world may be unattainable if firms fail to engage in robust agreements and relationships that will generate the resources required for growth and success (Kim et al., 2020).

To minimize uncertainty, supply chain stakeholders, target the reduction of their dependency on other firms, thereby making such firms lean on them independently (Nandi et al., 2021). Previous research has examined resource dependency potential to mitigate uncertainty and risk and increase supply chain robustness and resilience. Manhart et al. (2020) reveal that adequate handling of external resources and minimized dependence on exchange partners lessens business weakness, thus improving the capability for risk mitigation in a firm. Bode et al. (2011) observe that buffering and bridging are resource-dependency approaches to managing dependencies. Certainly, communication with an exchange partner can be minimized through buffering. It can mitigate the obstructions that dependency might cause on the rapport while introducing safeguards to cushion supply chain uncertainties and risks.

Furthermore, the resource-based theory propounded by Penrose (1959) highlights that through concerted effort, firms can garner a competitive advantage through resource accumulation and integration (Barney, 1991). Truly, manufacturing firms can earn a competitive advantage by using complementary resources via 3PL (Etokudoh et al., 2017). Logistic organizations must deploy major resources to improve operational performance, success, and survival (Etokudoh et al., 2017). This theory (Chong, 2021) provides the bulwark for justifying the 3PL position of competitive advantage. Lin and Wu (2014) posit that to achieve and maintain equilibrium in the dynamic marketing environment, firms must integrate third-party resources with their own resources. Etokudoh et al. (2017) observe that companies can improve logistics services and save costs by acquiring 3PL providers' resources. A manufacturing firm's capacity and ability to invest in developing resources and capabilities, core competencies, and gaining and sustaining a superior competitive advantage influence outsourcing decisions (McIvor, 2008).

Moreover, the actualization of competitive advantage and higher market growth and position demands that a firm earns unrestricted access to innovations and invaluable assets (Bolumole et al., 2007). The resource-based theory is the most appropriate theory to back up this study. It provides a suitable background for critically analyzing logistic organizations' outsourcing capacity and strategies (Somuyiwa et al., 2015). This theory suggests that having the necessary and proper capabilities and core competencies is the key resources required to achieve organizational objectives. In fact, supply chain disruption has emerged as a critical area of academic research. During the COVID-19 era, the supply chain encountered multiple challenges that led to the collapse and suspension of business activities that ultimately resulted in many job losses and increased poverty.

2. AIM AND HYPOTHESES DEVELOPMENT

The study intends to ascertain what triggers 3PL performance in supply chains in post-COVID-19 era in Nigeria. It proposed three antecedents of logistics performance: relationship management, 3PL capability, and supply chain uncertainty and risk. It is anchored on resource dependency and resource-based theories. Full mediation by supply chain uncertainty and risk is based on the as-

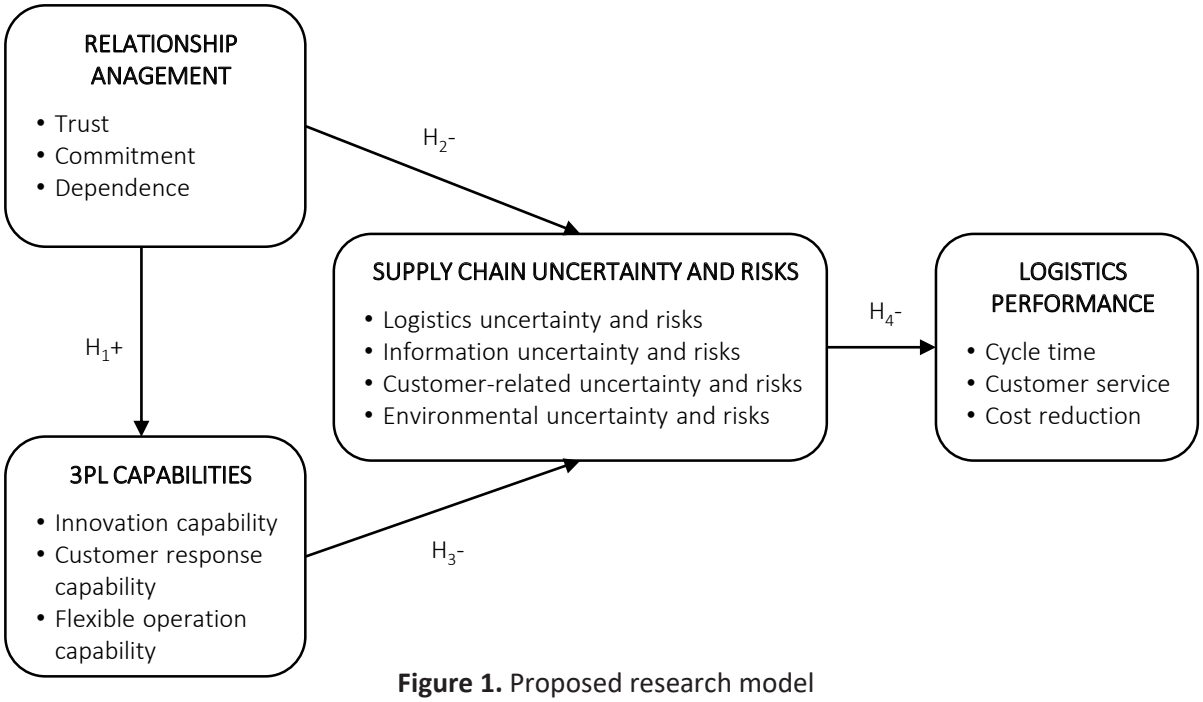

Figure 1. Proposed research model

sumption that uncertainty and risk are inherent in every supply chain under a pandemic. The research framework is depicted in Figure 1.

Following the extant literature review, the study formulated four hypotheses:

H1: Relationship management is positively and significantly associated with 3PL capability.

H2: Relationship management is negatively and significantly associated with supply chain uncertainty and risk.

H3: 3PL capability is negatively and significantly associated with supply chain uncertainty and risk.

H4: Supply chain uncertainty and risk are negatively and significantly associated with logistics performance.

3. METHODOLOGY

The study conducted a descriptive survey because of the non-manipulative nature of the variables. The target population consists of 4,024 manufacturing companies in different sectoral groups and geopolitical zones registered with the Manufacturers Association of Nigeria (MAN). A sample size of 364 was determined, and in selecting 364 manufacturing companies, the study adopted the stratified random technique. Primary data were collected via a self-administered e-mail questionnaire; questionnaire items and measurement scales were adapted from previous studies. Relationship management (trust, commitment, and dependence) was adapted from Anderson and Narus (1990); other measures such as logistics capability measures (innovation, customer response and flexible operation); supply chain uncertainty and risks (logistics, information, customer- related, and environmental uncertainty and risks) and logistics performance (cycle time, customer service and cost reduction) were adapted from Wang et al. (2018). Subsequently, a confirmatory factory analysis used structural equation modeling. It was found that the instrument has adequate validity and reliability.

The survey has two sections. The first section collected demographics; the second section used a 5-point Likert scale (strongly disagree to strongly agree) to analyze the selected variables.The study sampled 364 manufacturing companies, and 364 copies of the questionnaire were distributed, and each was filled by a supervisory/management staff of a company. Out of the total number distributed,

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281 were returned via email, but ten incomplete responses were eliminated. Thus, the usable 271 copies yielded a 76% response rate. In total, 195 (72%) are male, while 76 (28%) are female,reflecting male dominance in the manufacturing industry. Job title of the respondents indicates that 177 (65.3%) are at the managerial level, 57 (21%) at the supervisory level, and 37 (13.7%) are at operating levels in their companies. This clearly indicates that the respondents are majorly managerial and supervisory staff. The distribution of companies by number of employees indicates that 152 (56.7%) have 200 employees or less while 119 (43.3%) have more than 200 employees, thus revealing that the companies are mostly SMEs. The distribution of respondents' companies by zones in Nigeria indicates that 64.7% of the manufacturing companies are in the Southern part, while 35.3% are in the Northern part of Nigeria.

The paper employs Smart PLS 2.0 software (Ringle et al., 2015). First, the measurement model was checked for validity and reliability; next, the analysis tested the hypothesized relationships in the structural model. Consequent to its appropriateness, the PLS-SEM technique was adopted (Hair Jr. et al., 2014).

4. RESULTS

The two-step approach was adopted to assess data validity and reliability (Hair Jr. et al., 2014). First, through factor analysis, the reliability of the instrument was examined, after which the validity of the constructs was determined. Two methods assess the reliability of the instrument: Cronbach's alpha and composite reliability. Then, using the SEM-Smart PLS software, 65 scaled items were factor-analyzed, as shown in Table 1.

Table 1. Items' factor loadings, reliability, and validity (AVE)

Indicators	Items	Factor Loading	*t*-value
CAP:	**Logistics capability a=.789, CR= .744, AVE =.574**		
IC1	My company applies creative techniques in freight movement and distribution.	.777	19.445
IC2	My company is regularly improving its operational systems.	.755	17.561
IC3	My company is adopting technology and innovative solutions to resolving problems.	.773	13.962
IC4	My company applies simplification of operations.	.585	6.615
IC5	My company applies protection for freight safety and risks.	.700	10.642
CRC1	My company has a customer services management system.	.799	12.761
CRC2	My company is capable of responding to customers' requests.	.737	13.856
CRC3	The needs of customers are met by making services in my company flexible.	.753	16.165
CRC4	My company records low freight damage.	.823	19.118
CRC5	My company maintains consistent on-time delivery for all customers.	.832	18.541
FOC1	My company has widespread delivery coverage in Nigeria.	.707	19.502
FOC2	My company has global delivery coverage.	.683	10.642
FOC3	Flexibility of delivery scheduling and routing is experienced in my company.	.659	9.974
FOC4	My company has skilled and qualified personnel.	.720	9.728
FOC5	Delivery frequency is achieved in my company.	.722	12.785
RM:	**Relationship management: a=.730, CR= .758, AVE =.552**		
TRUST1	My company is accessible during service problems.	.865	6.772
TRUST2	My company expresses confidence in customers.	.764	12.765
TRUST3	My company communicates with sincerity.	.727	9.728
TRUST4	My company provides consistent service.	.652	15.726
TRUST5	My company provides quality service.	.580	2.915
COMT3	My company provides optimal attentiveness.	.678	15.726
COMT4	My company demonstrates loyalty.	.620	7.782
DEP1	My company initiates inter-organizational relationships.	.606	6.322
DEP2	My company is cooperative during organizational changes.	.533	5.991
DEP4	My company has customized its services to meet customer requirements.	.694	11.604
RISK:	**Supply chain uncertainty and risk: a=.878, CR= .815, AVE =.613(Degree of impact)**		
LUR1	Inadequate fleet/delivery capacity and storage issues.	.516	6.028
LUR2	Delays in pickup/delivery.	.562	2.608
LUR3	Poor design of the company's transportation network.	.675	10.685

Table 1 (cont.). Items' factor loadings, reliability, and validity (AVE)

Indicators	Items	Factor Loading	*t*-value
LUR4	Breakdown of equipment, trucks, and delivery vans.	.611	7.234
LUR5	Loss/missing freight.	.602	6.231
IUR2	Incorrect information (address, time, quotation).	.702	9.728
IUR3	Crashing of external and internal IT systems, scanners, and mobile phones.	.565	2.834
IUR4	Poor security of information system.	.663	11.514
IUR5	Information sharing within my company needs to be improved.	.516	2.618
CUR1	Delays due to customers' mistakes (e.g., not home, incorrect dangerous goods paperwork, isolations due to pandemic).	.778	19.504
CUR2	Damages due to customers' faults (prohibited items).	.758	15.915
CUR3	Inaccurate forecast of customers' freight volume.	.759	13.621
CUR4	Poor communication between company and customer.	.668	6.382
CUR5	Complexity of process (e.g., international dangerous goods).	.614	7.346
EUR1	Labor/driver shortage.	.667	10.648
EUR2	Route congestion/closures.	.677	11.604
EUR3	Weather/natural disasters/industrial actions (storms, floods, earthquakes, tsunamis, pandemics).	.892	25.273
EUR4	Unstable gasoline prices.	.855	18.541
EUR5	Uncertainty due to government laws/regulations (e.g., import duties increase, borders closures due to pandemics, wars).	.707	14.851
LP:	**Logistics performance: a=.846, CR= .793, AVE =.589**		
CT1	My company has a shorter order cycle time than the industrial average.	.706	2.228
CT2	My company has minimal stock out levels.	.730	2.662
CT4	My company provides consistent delivery service.	.667	11.608
CT5	My company has an order acceptance and processing system.	.743	16.118
CS1	My company provides punctual delivery service.	.715	10.272
CS2	My company responds quickly to changes.	.582	6.614
CS3	My company is flexible and adaptable to changes.	.701	9.728
CS4	My company employs value-added logistics services.	.730	2.662
CS5	My company has a few customer complaints.	.728	2.322
CR1	My company has decreased inventory costs.	.758	12.763
CR2	My company has decreased warehousing costs.	.704	9.738
CR3	My company has minimized transportation costs.	.817	17.263
CR4	My company maintains low operating costs.	.652	15.364

Note: CAP = 3PL capabilities, IC = Innovation capability, CRC = Customer response capability, FOC = Flexible operation capability, RM = Relationship Management, Trust = Trust, COMMT = Commitment, DEP = Dependence, RISK = Supply chain uncertainty and risk, LUR = Logistics uncertainty and risks, IUR = Information uncertainty risks, CUR = Customer-related uncertainty and risk, EUR = Environmental uncertainty and risk, LP = Logistics performance, CT = Cycle time, CS = customer service, CR = cost reduction.

The output from the factor loadings ranged from 0.516 to 0.892, exceeding 0.5 (Hair Jr. et al., 2014), with a significant level of $p < 0.05$. Cronbach's alpha was above the 0.5 limit for moderate reliability, while the composite reliability scores were above the recommended 0.7 threshold (Bagozzi & Yi, 1988). These clearly show that the indicators of the latent constructs are internally consistent. However, construct validity is attained when convergent and discriminant validity is met (Hair Jr et al., 2014). An instrument can only attain convergent validity if the average variance extracted (AVE) is 50% or above and reflective indicators load.

Table 1 shows the constructs' loadings, which are above 50%. The latent constructs have AVE values ranging from 0.552 to 0.613, significant at $p < 0.05$. The analysis supported the theoretical convergent validity, which relies on the fact that more than one-half of the variations observed in the reflective indicators were accounted for by their theorized factors rather than measurement error (Fornell & Larcker, 1981). Thus, typical evidence is that convergent validity is met (Bagozzi & Yi, 1988).

The discriminant validity of the research model was then examined. The criterion for assessing the discriminant validity requires each construct to

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Table 2. Construct correlations and discriminant validity

Constructs	CAP	LPR	RISK	RM
CAP	0.758			
LP	0.234	0.743		
RISK	.0464	.0930	0.786	
RM	0.365	0.210	0.156	0.768

Note: Square roots AVE are in the diagonal; all correlations are significant at 0.05 levels. CAP = 3PL capabilities; LP = Logistics performance; RISK = Supply chain uncertainty and risk; RM = Relationship Management.

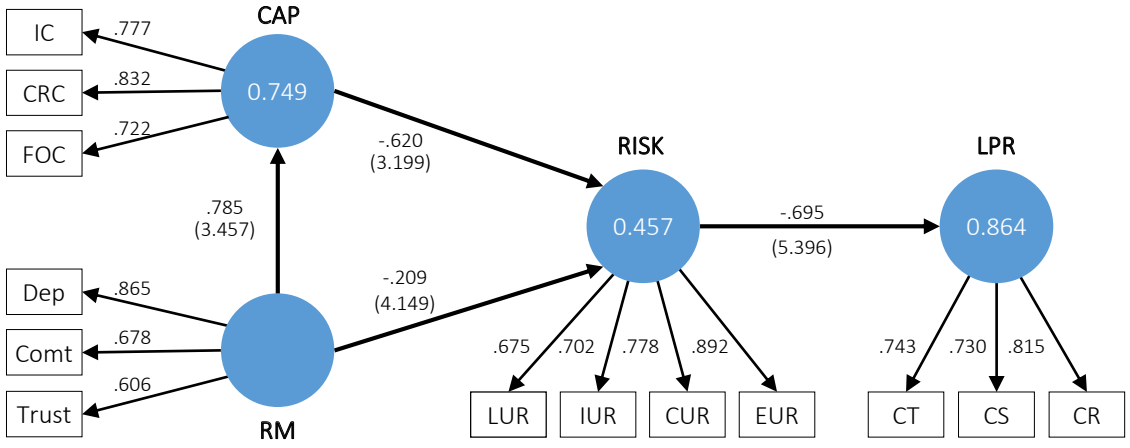
Table 3. Estimated results of the structural model and hypotheses tests outputs

Direct effects / Hypothesized Relationships	Pathcoefficient	StandardError	*t*-value	Result
H_{1+} → RMCAP	0.785	0.022	3.457***	Supported
H_{2-} →RMRISK	−0.209	0.041	4.149***	Supported
H_{3-} → CAPRISK	−0.620	0.112	3.199***	Supported
H_{4-} → RISKLP	−0.695	0.933	5.396***	Supported

Note: Significant level is denoted as *** $p < 0.001$.CAP = 3PL capabilities, RM = Relationship Management, RISK = Supply chain uncertainty and risk, LUR = Logistics uncertainty and risks, LP = Logistics performance.

share more variance with its indicators than any other construct (Fornell & Larcker, 1981). Thus, the square roots of the AVE should be higher than the latent construct (Hair Jr. et al., 2014). The AVEs of the latent constructs in Table 1 range from .552 to .613. Table 2 shows the squared output of the AVEs for each latent construct, with higher correlations among the latent variables.Therefore, the measurement model demonstrates evidence of both convergent and discriminant validity and allows the opportunity to examine the relationships needed to test the hypotheses.

The proposed research model and hypothesized relationships were tested using the PLS-SEM technique. All the hypothesized relationships (alternate) were accepted at a 0.05 significance level. In other words, the study found that relationship management has a significant positive association with 3PL capability, indicating that hypothesis 1 is accepted. Relationship management has a significant negative association with supply chain uncertainty and risk, indicating that hypothesis 2 is accepted. 3PL capability has a significant negative association with supply chain uncertainty and risk indicating that hypothesis 3 is



Note: CAP = 3PL capabilities, IC = Innovation capability, CRC = Customer response capability, FOC = Flexible operation capability, RM = Relationship Management, Trust = Trust, COMMT = Commitment, DEP = Dependence, RISK = Supply chain uncertainty and risk, LUR = Logistics uncertainty and risks, IUR = Information uncertainty risks, CUR = Customer-related uncertainty and risk, EUR = Environmental uncertainty and risk, LP = Logistics performance, CT = Cycle time, CS = Customer service, CR = Cost reduction.

Figure 2. PLS-SEM output of hypothesized relationships and the structural model

accepted. Supply chain uncertainty and risksignificantly negatively affect logistics performance, indicating that hypothesis 4 is accepted. The strength of the association between the latent constructs indicated that the strongest predictive power within the model falls on the associationbetween relationship management and third-party logistics capability (β= 0.785; t = 3.457; p < 0.001), followed by the association between supply chain uncertainty and risk, and logistics performance (β = –0.695; t = 5.396; p < 0.001). This was followed by the link between 3PL capability and supply chain uncertainty and risk (β = –0.620; t = 3.199; p < 0.001). The last was the association between relationship management and supply chain uncertainty and risk (β= –0.209; t = 4.149; p < 0.001). All the hypothesized associations within the research model and their outcomes are shown in Table 3 and Figure 2.

5. DISCUSSION

The results show a significant positive association between relationship management and third-party logistics (3PL) capability. The finding affirms Knemeyer and Murphy (2005), that trust, commitment, and dependence facilitate the successful functioning of relationships. The study also found that relationship management has a significant negative association with supply chain uncertainty and risk. This finding supports Miller (1992), who found mitigating risk strategies to include avoidance, control, cooperation, and flexibility. The finding also affirms Nagarajan et al. (2013) that collaboration among supply chain members increases responsiveness to marketplace movement and logistics flexibility.

Moreover, third-party logistics capability has a significant negative relationship with supply chain uncertainty and risk. This finding is in tandem with Chopra and Sodhi (2004) that increasing supply chain flexibility is an approach that mitigates uncertainty and risk and boosts logistics performance. Lastly, supply chain uncertainty and risk have a significant negative association with the logistics performance of outsourcing manufacturing companies in Nigeria. This finding supports the already established theoretical negative relationships between supply chain uncertainty and risk and logistics performance (Simangunsong et al., 2012).

It also proves that mitigating supply chain uncertainty and risk improves logistics performance. Thus, relationship management and 3PL capability can mitigate supply chain uncertainty and risk. In other words, when supply chain partners show more trust, commitment, and dependence on one another, 3PL innovation, responsiveness, and flexibility increase, while delays in delivery time, storage, information, and communication issues decrease. These lead to a reduction in costs and cycle time and an increase in customer service and satisfaction. These findings provided empirical evidence for the resource-based and resource-dependency approach to mitigating supply uncertainty and risk.

The study developed a model to provide predictive and concurrent validity for logistics performance, given the significant associations that affirm theoretically established relationships between the constructs. In other words, to improve logistics performance, supply chain partners could manage their relationships to strengthen 3PL capability to mitigate supply chain uncertainty and risk. It offers a strategic framework for leveraging third-party logistics to manage supply chain uncertainty and risk to improve logistics performance. The framework enjoins companies to consider holistically the interplay of all the primary drivers of 3PL performance in order to optimize logistics performance.

Similar to earlier research, this study affirms the positive effects of 3PL capability on logistics performance. But it differs by exploring the effects of the interplay between relationship management and 3PL capability on 3PL capability and logistics performance indirectly by taking the mediating effect of supply chain uncertainty and risk into account.

CONCLUSION

This study aimed to identify the stimulators of third-party logistics performance in supply chains in Nigeria during the post-pandemic era. The focus was on the impact of relationship management by supply chain partners and third-party logistics capability on mitigating supply chain uncertainty and risk

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to improve logistics performance.Relationship management, third-party logistics capability, and supply chain uncertainty and risk are the key drivers of third-party logistics performance in manufacturing companies in Nigeria in the post-COVID-19 era. Although relationship management and third-party logistics capability are the main drivers of third-party logistics for mitigating supply chainuncertainty and risk, relationship management hasdual impacts, first onthird-party logistics capability and second on supply chainuncertainty and risk, thus signifying the greater role of relationship management in mitigating supply chainuncertainty and risk aimed towardimproving logistics performance. The findings demonstrate that 74.9% of the variance in third-party logistics capability is explained by relationshipmanagement, 45.7% of the variance in the reduction of supply chainrisk is explained by relationshipmanagement and third-party logistics capability, and a reduction in supply chain risk explains 86.4% of the variance in logistics performance.

Furthermore, this study has filled a gap in the logistics literature by developing a holistic conceptual model of third-party logistics performance drivers that can be used in the future to measure third-party logistics impact and explain why logistics outsourcing arrangements can fail irrespective of third-party logistics capability. By underpinning the constructs with resource-based views and resource dependency theories, the findings provide empirical support for the two theories. Moreover, the managerial implication of the finding is the need for managers of outsourcing companies to realize that they are also accountable for the success or failure of third-party logistics arrangements.

Thus, the relationship management constructs such as trust, commitment and dependence should be continuously improved to boost 3PL capability. Also, trust, commitment and dependence should be steadily improved to reduce or totally eliminate supply chain uncertainty and risk. Moreover, the 3PL capability elements such as innovation capability, customer response capability and flexible operation capability should be adequately upgraded to drastically reduce or eliminate supply chain uncertainty and risk. Finally, relationship management as well as 3PL capability should be continually enhanced to improve to boost overall logistics performance.

AUTHOR CONTRIBUTIONS

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