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SUPPLY CHAIN RISK MANAGEMENT AND PERFORMANCE OF COMMERCIAL STATE CORPORATIONS IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

Organizations are recognizing the need to adopt risk management strategies to be able to overcome the turbulence in the market caused by variations in supply chains. This approach can in turn enable the managers, risk analysts and stakeholders to focus on minimizing the potential impact of threats. State corporations are facing challenges related to supply chain disruptions that have affected profitability and lead time. The general objective of the study was to understand the relationship between supply chain risk management practices on performance of commercial state corporations in Kenya . The specific objectives were to examine effect of distribution channel risks and supplier integration risks on performance of commercial state corporations in Kenya. The study was guided by resource-based view theory and transaction cost theory. The study adopted a descriptive research design. The unit of analysis was 46 commercial state corporations in Kenya. The unit of observation was 46 procurement, 46 operations, 46 distribution/logistics, 46 quality assurance, and 46 finance departments managers. Yamane 1967 sampling formula was used to sample 146 managers . Questionnaires were used to collect data. A pilot was conducted with 10% of the sample hence 15 management staff. The study used content and construct validity. Questionnaire reliability was evaluated using Cronbach's Alpha Coefficient. Data was sorted and coded for analysis using Statistical Package for Social Sciences (SPSS) version 24. Data was presented in tables. The content of the questionnaire was validated by the research professionals. In addition, construct validity results show that; AVE for distribution channel risks is 0.540, supplier integration risks 0.540, and firm performance 0.552. The reliability test results show that; distribution channel risks (0.889), supplier integration risks (0.897), and performance of state corporations (0.903) which all show acceptable reliability. Regression analysis findings revealed that supplier integration risks had the greatest negative effect ($B = -0.410$, $p = 0.000$), followed by distribution risks ($B = -0.372$, $p = 0.000$). The study concludes that supply chain risks negatively impact firm performance, with supplier integration and distribution risks being the most critical. To mitigate these risks, firms should enhance supplier management, optimize logistics networks, and adopt agile procurement strategies. Future research should explore other performance determinants, including technology and regulatory frameworks.

Key Words: Supply Chain Risk Management Practices, Distribution Channel Risks, Supplier Integration Risks, Performance, Commercial State Corporations

Background of the Study

Supply Chain Risk Management (SCRM) is defined as the process of creating a strategy and working to identify, assess and mitigate the risk in your entire supply chain. Organizations are recognizing the need to adopt risk management strategies to be able to overcome the turbulence in the market caused by variations in supply chains. This approach can in turn enable the managers, risk analysts and stakeholders to focus on minimizing the potential impact of threats (Gurtu & Johny, 2021). Supplier risk management entails actions such as identifying, assessing, and mitigating risks that are posed by suppliers. When supply market activity and the organization's interactions with suppliers lead to consequences that damage the firm's reputation, capability, operational integrity, or financial sustainability, the company is subject to supplier risk (Kamoni, Rotich, & Ochiri, 2018).

Many enterprise companies face disruptions caused by entities far down the supply chain. According to the Business Continuity Report (BCI, 2023), 31% of disruptions during 2022 came from Tier 2 suppliers and below. Companies Therefore need better supply chain risk management strategies to avoid such unwelcome surprises. Supply chain networks are created to counteract the effects of increasing levels of global competition, demanding customers and employees, shrinking product lifecycles, and decreasing acceptable response times. However, as organizations increase their dependence on these networks, they become more vulnerable to their suppliers′ operational risk profiles as well as other categories of risk associated with supply chains. Suppliers with a high probability of operational risk event occurrences can have a significant impact on the revenues realized by organizations that rely on their inputs (Ahmed & Huma, 2021). Ominde et al., (2022) indicated that the goal of supplier risk management is to lessen exposure and guarantee continuity in the face of both routine and unforeseen threats to the supply chain, which are assessed and managed in real time. Such risks include product failure, disruption, operational risk, distribution risk, legal risk, supplier involvement, financial risk, and competitive risk. Nguyen et al. (2022) highlight the multifaceted nature of supply chain risks, encompassing distribution channel risk, procurement risks, operational risk, demand risk, logistics risk, information risk, and environmental risk. The study adopted four supply risks. These include the distribution channel risk, and supplier integration risks.

Statement of the Problem

State Corporations in Kenya were established with the aim of rendering services to the Citizens in a cost-effective way and be able to sustain them in a competitive global environment. However, some State Corporations have not performed to the expectations of their mandate since they have suffered from scandals of corruption, inefficiency and unethical practices in the process of delivering services to the Citizens. According to Kenya's Auditor General Report (2019-2020), there were many instances of misuse of public funds by State Corporations. Massive scandals and fraud involving millions of shillings in public funds were unearthed in various Counties (Auditor-General report for 2019/2020). More than Ksh.10 billion may have been lost in the 2019/2020 financial year in Government Ministries, Departments and Commissions.

The National Treasury and Planning (2023) report revealed that 11 SCs are loss-making, and 11 reflect a high liquidity risk, implying that they are unable to service short-term obligations when they fall due. Subsequently, 14 SCs have accumulated sizable arrears, totaling KShs. 211 Bn. Equivalent to 2.2% of GDP. A report by The Presidential Taskforce on Parastatal Reforms(2013) indicated that from one hundred and thirty (130) reports scrutinized by the Auditor General, only twenty three (23) State Corporations were viable (Fiebelkorn, Owuor, & Nzioki, 2021). Apunda and Ndede (2020) reported that the commercial state corporations are facing challenges in maintain the operations and are relying on government support or

sustainability. The poor performance of commercial state corporations has led to the planned restructuring of state agencies as some were merged while others were wound up. The restructuring will lead to merging State corporations to reduce duplication of roles among the staff and closing of struggling state corporations.

Several scholars in Kenya have focused on supply chain risk management; Owich and Odero (2023) found that supplier risk management practices have a significant effect on performance of supply chains within the healthcare sector in Kenya. Ochieng (2019) found that risk identification had a positive and significant effect on manufacturing firms' performance in Kenya. Ngii (2017) showed that there a significant relationship between supply chain risk management and performance of Accelar Global Logistics Company. None of the reviewed studies focused on supply chain risk management in state corporations in Kenya. This study hence sought to study effect of supply chain risk management practices on performance of commercial state corporations in Kenya.

Objectives of the Study

i. To examine the effect of distribution risks on performance of commercial state corporations in Kenya.

ii. To establish the effect of supplier integration risks on performance of commercial state corporations in Kenya.

LITERATURE REVIEW

Theoretical Literature Review

Resource-Based View Theory

Resource-based view theory was formulated by Birger Wernerfelt and Barney in 1984. Resources, skills, and strategic assets are the main topics addressed by resource-based theory. According to Barney (2001), RBV enables the firm to examine whether the resources of the firm are valuable or whether they can assist the organization in achieving its expected goals. The purpose of evaluating resources is to get a deeper understanding of which resource has uniqueness and is not available to the competitors. The theory places primary emphasis on the capabilities and resources that are already present within an organization as the most important factors influencing that organization's level of success (Wang et al., 2016). The RBV Theory proposes that an organization's one-of-a-kind resources, assets, and capabilities, including its patent rights, brand recognition, and corporate culture, can be capitalized on to establish a competitive edge and maximize superior performance (Xu, Huo & Sun, 2014). This theory notes that, since they have access to strategic capital, businesses achieve a continuous competitive advantage. Such assets have distinctive features that are unusual, and important, cannot be imitated, and do not have a near replacement (Lai et al., 2012)

RBV Theory proposes that the integration of suppliers can be a significant source of sustainable competitive advantage for businesses (Weingarten et al., 2013). This is because it enables organizations to gain access to a wider variety of resources, assets, and capabilities while also enhancing their levels of efficiency and adaptability. Companies are increasingly aware of the interlinkages that inevitably occur between all the institutional operating processes of an organization and those of suppliers and clients (Wang et al., 2016). This theory supports the variables by linking transportation and distribution channels to ensure an optimum smooth supply chain.

Transaction Cost Theory

Transaction cost theory was proposed by Ronald Coase in 1937. Transaction cost economics analyzes economic situations on a micro-analytic level, thereby focusing on the importance of asset specificity and contracts; treating different (social) behaviors as unimportant (Williamson, 1989). Further, transaction cost theory helps to identify transaction costs such as search and information costs, bargaining and decision costs, and policing, and enforcement costs in economic exchange situation (Dahlman, 1979; Williamson, 1989). Applying transaction cost theory within the field of supply chain management focuses on the decision whether to outsource activities or produce products in-house. This decision process evaluates asset specificity, includes behavioral assumptions of bounded rationality, and considers risks such as opportunistic behavior. Therefore, various costs such as opportunism, contract penalties, long-term relationships, or joint investments of an exchange are included in the decision process on the supplier to source from (Subramani, 2004). The theory supports the supply integration risks variable since it will guide on the risks involved in supplier integration which will enable the management to pint out the most suitable processes to integrate suppliers particularly when solving supply chain problems.

Conceptual Framework

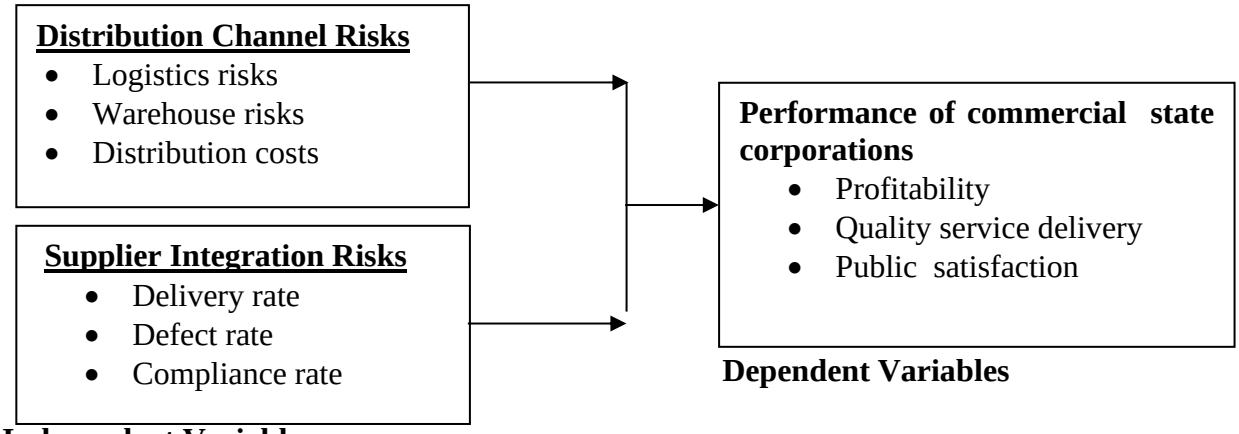

Figure 2. 1: Conceptual Framework

Distribution Channel Risks

Distribution channel refers to the route products or services take to reach a customer. Distribution companies face various risks that can disrupt their processes, impact customer satisfaction, and ultimately harm their bottom line. Effective risk management in distribution is essential to identify and mitigate these risks. The distribution channel risk is identified by assessing how vulnerable the channel is to money laundering or criminal activities based on attributes that may make it easier to hide customer identity (Marano, 2021). The risk of failing to identify a customer correctly may be higher for distribution channels that use an intermediary or do not require face-to-face contact. Depending on the product, distribution channel risk may be mitigated by using distributors who are also subject to anti-money laundering and counter-terrorist financing obligations or a pension scheme subscribed through the customer's employer.

Selecting the right distribution channels for a products or services is a crucial decision that can affect profitability, customer satisfaction, and competitive advantage. However, there are also many risks involved in choosing and managing distribution channels, such as high costs, legal issues, quality problems, and market changes (Malik, 2020)

According to Gill (2012), delayed distribution leads to lengthy and unpredictable lead times, poor performance and increased vulnerability of communities who are no longer able to cope with their own resources. Having intermediaries in the supply chain may be an advantage while in other instances, turns out to be a supply chain risk and or risk source. Manuj and Mentzer (2018b) assert that effective and efficient distribution channels are of crucial importance to the generation of the future business.

Supplier Integration Risks

Supplier risk is the probability of supplier failures which results in the inability of the purchasing firm to meet customer demand or cause threats to customer life and safety (Dana, Nguyen, & RafalKuc, 2021). Supplier integration involves jointly resolving problems and facilitating operations by working together with customers and suppliers. Supplier integration may have positive long-term effects, but it takes longer for firms to integrate with their suppliers, and it is costly, which worsens both competitive and financial performance (Chang et al., 2015). Sohani (2021) indicates that supplier integration is an imperative strategy to improve firm performance and enhance a firm's competitive advantage in the marketplace. Several supplier integration activities, including supplier involvement, design integration, supplier base reduction, supplier commitment, and information-sharing practices are examined regarding their effect on time-based competition.

Integrated supply chain risk management provides supply chain organisations with a level of insight into their supply chains yet to be achieved. If correctly applied, this process may optimise management decision-making and assist in the protection and enhancement of shareholder value. Supplier integration including communication, sharing of information on matters pertaining to inventory data and production scheduling, and working with suppliers, reduce upstream complexity thus improving schedule attainment (Lee, 2021). Bozarth et al. (2019) established that manufacturers reduce the bullwhip effect by working with suppliers on matters pertaining to sharing information about production plans and demand forecasts, which are related to schedule attainment. Chaudhuri et al (2020) indicated that supply chain integration is used to develop capabilities for joint risk planning within the organization and with members of the broader supply network, and then to develop collaborative risk management capabilities, which improves the supply chain's ability to respond to risks.

Empirical Review

Distribution Channel Risks and Firm Performance

Obaji (2011) investigated effect of distribution channel in manufacturing sector in Nigeria. The study employed descriptive research design. The study targeted 300 consumers, distributors and marketing staff. The data collection instruments included questionnaires, interview guides and observation checklists. Results showed that the risks involved in distribution affects product sales since defaults that occurs during affects firm performance. Chesesio (2016) studied effect of supply chain on performance of New KCC. A descriptive research design was used. The study sampled 84 staff. Questionnaires were used to collect data. Results showed that effective distribution management process ensures that products are efficiently transported from the farmers, to the companies for processing, and to the distributors who convey finished products to the final consumers. The study concluded that distribution channels have a significant impact on organization performance.

Kuma (2019) studied the dairy sector supply chain in Ethiopia. The study proved the importance of effective distribution channels in the dairy sector. The firms improved the

logistics and distribution network through addressing supply chain constraints. Optimizing the distribution channels can lead to increased market access, reduced transaction costs, and enhanced supply chain performance for dairy processing firms. Chugi (2022) explored the distribution network economy and logistics performance of fresh milk processing firms in Kenya. The study employed a descriptive design approach. The target was 42 licensed milk processing firms in Kenya. questionnaires were used to collect primary data that was collected online. The results indicated that the positive and significant relationship between distribution network collaboration, transport management, distribution information technology optimization, backhaul management, and omnichannel distribution positively impacts the logistics performance of fresh milk processing firms in Kenya.

Supplier Integration Risks and Firm Performance

Duoming and Chin (2022) sought to determine effect of supply chain integration on supply chain risks. Results showed that supply chain risk is a great concern to many firms especially after the global supply chain disruptions. To overcome the supply chain disruptions, the firms need to expand the network of suppliers, be more informed on supplier locations, and effectively manage the supplier network. Riaz, Rida, and Muhammad (2020) examined the impact of supplier integration on firm competitiveness and financial performance in the manufacturing sector in Pakistan. The study employed a cross-sectional survey design. The study sample included 267 managers working in the manufacturing sector of Pakistan. Results showed that supplier integration have a positive impact on financial performance. Zhao, Huo, Sun, and Zhao (2023) explored the relationships between supply chain risks (SCRs), supply chain integration (SCI), and company performance. Data was collected from 317 manufacturing plants in ten countries. Results show that SCRs, especially supply delivery risk (SDR), are negatively related to SCI. Different types of SCI play different roles in improving different types of company performance. Supplier, internal, and customer integration are the most important drivers for schedule attainment, competitive performance, and customer satisfaction.

Ali and Gossaye (2023) examined the effects of supply chain viability on supply chain performance in large manufacturing firms in Ethiopia. Findings showed that SC resilience, SC agility, and sustainable SC have a positive effect on SC performance. SC performance also plays a partial mediation between SC viability and marketing performance. Cheruiyot (2018) analyzed the effect of supply chain integration on the operational performance of manufacturing organizations in Kenya. The study adopted a descriptive research design. A questionnaire was used to collect data. The findings showed that supplier integration had a positive influence on operational performance followed by internal integration. Customer integration was determined to have a negative influence on operational performance. There was an association between supplier integration and customer integration with internal integration

RESEARCH METHODOLOGY

The study adopted a descriptive research design. The descriptive approach is concerned with answering questions such as who, how, what, which, when and how much (Cooper & Schindler, 2011). For this study, the unit of analysis was the commercial state corporations. According to the State Corporations Act, there are 46 commercial state corporations in Kenya. Meanwhile, the unit of observation is the individual managers within these corporations, who provide firsthand data regarding supply chain risks and performance. Specifically, data was collected from 230 managers across five departments: Procurement (46 managers), Operations (46 managers), Distribution/Logistics (46 managers), Quality Assurance (46 managers), and

Finance (46 managers). Therefore, the target population was 230 respondents. The sampling frame for this study was the 46 commercial state corporations in Kenya.

The sample size of 146 was determined using Yamane 1967 formula. The study used simple random sampling. In every state corporation, the researcher randomly selected at least three management staff until the desired sample size was achieved. This ensured that all the 46 state corporations were well represented in the study. The study used questionnaires to collect data. A pilot study was conducted with 10% of the sample size as recommended by Orodho (2014). The pilot was hence conducted with 15 management staff that did not take part in the actual study. Pilot test was done to check the validity and reliability of the questionnaire. After data collection, it was sorted and coded for analysis using Statistical Package for Social Sciences (SPSS) version 24. Data was analyzed using descriptive (frequency, percentage, mean, standard deviation) and inferential statistics (correlation, regression) and presented in tables. All the tests significance level were tested at 95% confidence level. Findings were tabulated, discussed, and interpreted accordingly.

RESEARCH FINDINGS AND DISCUSSIONS

Out of the 146 distributed questionnaires, 131 were correctly filled and returned, representing a response rate of 89.8%. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate, 60% is good, and above 70% is considered excellent for survey-based research. Therefore, the 89.8% response rate in this study is excellent, indicating a high level of respondent participation and enhancing the reliability of the study findings.

Descriptive Analysis

This section presents the descriptive statistics of the study variables, including distribution channel risks, supplier integration risks, and firm performance. The analysis provides insights into the mean and standard deviation values of each statement in the questionnaire, helping to assess the perceptions of respondents regarding supply chain risk management and firm performance in commercial state corporations in Kenya. The mean (M) represents the average response on a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), while the standard deviation (SD) indicates the variation in responses among the respondents.

The means and standard deviations were used to interpret the findings, where a mean value of 1.0 – 1.4 indicated strong disagreement, 1.5 – 2.4 indicated disagreement, 2.5 – 3.4 was neutral (not sure), 3.5 – 4.4 indicated agreement, and 4.5 – 5.0 indicated strong agreement with the statements. A higher mean (closer to 5) suggested a greater level of agreement, while a lower mean (closer to 1) indicated stronger disagreement. The standard deviation (SD) measured the spread of responses, where a low SD (closer to 0) showed strong consensus among respondents, and a high SD (closer to 1 or above) indicated more variation in opinions. This analysis helped to assess how respondents perceive supply chain risks and firm performance, highlighting areas that require improvement and those that are well-managed.

Distribution Channel Risks

The first objective of the study was to examine the effect of distribution risks on performance of commercial state corporations in Kenya. Distribution channel risks refer to challenges that affect the transportation, storage, and accessibility of goods and services within the supply chain. Respondents gave their level of agreement with various statements on distribution risk. The results are presented in Table 4.1 below.

Table 4.1: Descriptive Statistics for Distribution Channel Risks

Statements	Mean (M)	Standard Deviation (SD)
The firm maintains manageable transport costs in creating access to service delivery	4.120	0.721
The firm balances various transport modes to minimize time in transit	4.025	0.689
The firm relies on the transport function to create access and connectivity within the supply chain	4.110	0.705
The firm employs transport management practices to create efficiency and better access	4.078	0.677
The firm has various warehouses near the customer to reduce the cost of transport	3.962	0.755
The firm ensures that truck loads are optimized during delivery	4.150	0.695
Retailers increase product value by providing it to customers in wanted time, location, and quantity	4.085	0.710
We break large quantities of products, sort them, and forward them to customers in smaller, manageable quantities	4.045	0.720
Aggregate Score	**4.072**	**0.709**

The findings indicate that respondents generally agreed that their organizations effectively manage distribution channel risks, as reflected in the aggregate mean score of 4.072. The highest-rated aspect was ensuring truck loads are optimized during delivery (M = 4.150, SD = 0.695), suggesting that commercial state corporations prioritize efficient transportation to minimize costs and improve supply chain effectiveness. Similarly, respondents agreed that their firms maintain manageable transport costs (M = 4.120, SD = 0.721) and rely on transport functions to create access and connectivity in the supply chain (M = 4.110, SD = 0.705), indicating that transportation is a critical element in supply chain risk management.

Furthermore, employing transport management practices to create efficiency and better access (M = 4.078, SD = 0.677) and balancing various transport modes to minimize time in transit (M = 4.025, SD = 0.689) were rated highly, reinforcing the idea that diversification in transportation strategies contributes to supply chain resilience. Respondents also agreed that retailers increase product value by providing goods to customers at the desired time, location, and quantity (M = 4.085, SD = 0.710), highlighting the role of distribution efficiency in enhancing customer satisfaction. Additionally, breaking large quantities of products, sorting them, and forwarding them in smaller manageable quantities (M = 4.045, SD = 0.720) was seen as a key aspect of supply chain efficiency. However, the availability of warehouses near customers (M = 3.962, SD = 0.755) was the lowest-rated aspect, indicating that some organizations struggle with optimizing warehouse placement to reduce logistical costs.

Despite some variation, the standard deviations were relatively low (ranging from 0.677 to 0.755), indicating strong consensus among respondents regarding distribution channel risks. These findings suggest that state corporations have adopted structured logistics strategies to enhance supply chain performance, although warehouse distribution could be improved. The aggregate mean score of 4.072 aligns with existing literature on distribution risks and firm performance. Gill (2022) emphasizes that delays in distribution lead to unpredictable lead times, increased costs, and supply chain inefficiencies, reinforcing the study's finding that truck load optimization and effective transport management are critical for reducing distribution risks. Similarly, Manuj and Mentzer (2018b) highlight the importance of balancing transportation methods and managing logistics networks efficiently, supporting the high ratings

for transport management practices and access creation in supply chains. On the other hand, the relatively lower score for warehouse availability near customers is consistent with Malik (2020), who found that high warehousing costs and poor location planning hinder the efficiency of supply chain distribution networks. This suggests that commercial state corporations in Kenya may need to reassess their warehouse strategies to further improve distribution efficiency and overall supply chain resilience.

Supplier Integration Risks

The second objective was to establish the effect of supplier integration risks on performance of commercial state corporations in Kenya. Supplier integration risks refer to challenges in coordinating suppliers and maintaining quality standards. Respondents rated various statements on supplier integration risks and the findings are summarized in Table 4.2.

Table 4. 2: Descriptive Statistics for Supplier Integration Risks

Statements	Mean (M)	Standard Deviation
The firm uses information technology to share information with major suppliers	4.125	0.688
The accuracy of supplier deliveries in terms of quantity and specifications is evaluated	4.100	0.695
The rate of defective or non-conforming items delivered by a supplier is measured	4.078	0.705
There is a high degree of joint planning with suppliers	4.098	0.682
Supplier collaboration in innovation improves operations	4.085	0.700
Supplier risks (financial instability, geopolitical issues) are assessed	4.110	0.685
The firm keeps an updated supplier management inventory	4.040	0.710
Supplier compliance rate is assessed frequently	4.095	0.695
Aggregate Score	**4.091**	**0.694**

The findings in Table 4.7 indicate that respondents generally agreed that supplier integration risks are effectively managed within their organizations, as reflected in the aggregate mean score of 4.091 (SD = 0.694). The highest-rated aspect was the use of information technology to share information with suppliers (M = 4.125, SD = 0.688), suggesting that state corporations have adopted digital solutions to enhance supplier collaboration and data sharing, minimizing risks associated with poor communication and coordination. Similarly, assessing supplier risks such as financial instability and geopolitical issues (M = 4.110, SD = 0.685) was viewed as a priority, reinforcing the importance of proactive risk management in supplier relationships. Additionally, evaluating the accuracy of supplier deliveries in terms of quantity and specifications (M = 4.100, SD = 0.695) and frequent assessment of supplier compliance rates (M = 4.095, SD = 0.695) received high agreement, indicating that firms emphasize quality control and adherence to contractual obligations. Joint planning with suppliers (M = 4.098, SD = 0.682) and supplier collaboration in innovation (M = 4.085, SD = 0.700) were also seen as key factors in ensuring effective supplier integration, highlighting the importance of long-term partnerships and shared operational strategies.

On the other hand, keeping an updated supplier management inventory (M = 4.040, SD = 0.710) received a slightly lower mean, suggesting that while firms recognize its importance, there may be areas that require further improvement in tracking supplier data efficiently. Similarly, measuring the rate of defective or non-conforming items delivered by suppliers (M = 4.078, SD = 0.705) had a slightly lower mean compared to other statements, indicating that

while quality control measures exist, improvements in supplier defect tracking may enhance overall supply chain efficiency.

Despite some variations, the moderate standard deviations (ranging from 0.682 to 0.710) indicate a consistent level of agreement among respondents, suggesting that supplier integration is generally perceived as a well-managed aspect of supply chain operations. These findings imply that commercial state corporations in Kenya have established strong supplier integration mechanisms, particularly through technology use, joint planning, and quality control. However, further advancements in supplier data management and inventory tracking could further optimize supplier relationships and overall supply chain performance.

The findings align with previous research on supplier integration and firm performance. Lee (2021) highlights that effective supplier communication, particularly through technology, enhances supply chain coordination and reduces operational inefficiencies. This supports the study's observation that state corporations prioritize digital solutions to streamline supplier information sharing. Similarly, Chaudhuri et al. (2020) argue that supplier collaboration in innovation and risk management improves operational efficiency and competitive advantage, aligning with the findings that emphasize joint planning, supplier compliance assessments, and risk mitigation strategies. Additionally, Bozarth et al. (2019) assert that maintaining updated supplier data and managing compliance are crucial for preventing supply chain disruptions, reinforcing the need for further improvements in supplier inventory management as indicated in the study. Overall, the findings suggest that supplier integration is a well-established practice in commercial state corporations, with firms actively managing supplier risks and leveraging technology for enhanced collaboration. However, continuous improvements in supplier inventory tracking and compliance monitoring could further strengthen supply chain efficiency and resilience.

Firm Performance

The general objective of the study was to examine the relationship between supply chain risk management on performance of commercial state corporations in Kenya. Firm performance is a key outcome variable in this study, assessing how well commercial state corporations in Kenya manage their supply chain risks to enhance efficiency, customer satisfaction, and financial success. The descriptive statistics for firm performance are presented in Table 4.3.

Table 4.3: Descriptive Statistics for Firm Performance

Statements	Mean (M)	Standard Deviation
The state corporations deliver quality products	4.150	0.675
Quality of products has continuously improved	4.125	0.688
There has been a reduction in complaints on service delivery from the public	4.090	0.700
The corporation manages to achieve returns on investments	4.180	0.660
The corporation meets customer expectations through timely service delivery	4.110	0.680
The organization ensures compliance with regulatory and quality standards	4.085	0.690
Customer satisfaction surveys indicate positive performance improvements	4.145	0.682
The corporation has adopted innovation strategies to enhance service efficiency	4.120	0.695
Aggregate Score	**4.126**	**0.684**

The findings in Table 4.3 indicate that respondents generally agreed that firm performance is positively influenced by supply chain risk management, as reflected in the aggregate mean score of 4.126 (SD = 0.684). The highest-rated aspect was achieving returns on investments (M = 4.180, SD = 0.660), suggesting that effective risk management in the supply chain contributes to financial sustainability and profitability in commercial state corporations. Similarly, delivering quality products (M = 4.150, SD = 0.675) and continuous improvement in product quality (M = 4.125, SD = 0.688) were rated highly, indicating that firms recognize the importance of maintaining high-quality standards to enhance performance. Additionally, customer satisfaction surveys indicating positive performance improvements (M = 4.145, SD = 0.682) and meeting customer expectations through timely service delivery (M = 4.110, SD = 0.680) reinforce the role of customer-centric strategies in improving firm performance.

On the other hand, ensuring compliance with regulatory and quality standards (M = 4.085, SD = 0.690) and adopting innovation strategies for service efficiency (M = 4.120, SD = 0.695) highlight that while firms prioritize compliance and innovation, continuous improvement is necessary to maintain a competitive edge. Reducing public complaints on service delivery (M = 4.090, SD = 0.700) also indicates that although progress has been made, organizations must further address service concerns to enhance customer satisfaction.

The moderate standard deviations (ranging from 0.660 to 0.700) indicate a consistent level of agreement among respondents, suggesting that firm performance is widely recognized as a critical measure of success and a key driver of organizational sustainability. These findings imply that commercial state corporations have adopted structured strategies to improve product quality, customer satisfaction, and financial outcomes, but continued focus on compliance and innovation is necessary to maintain long-term performance improvements.

The findings align with previous research on firm performance and supply chain risk management. Fadun & Oye (2020) found that effective operational risk management positively influences financial performance, profitability, and service efficiency, supporting the study's observation that commercial state corporations prioritize financial sustainability and quality product delivery as key indicators of success. Their study emphasized that organizations that proactively manage risks tend to achieve better financial outcomes and operational efficiency, which is consistent with the emphasis on maintaining high-quality standards and meeting customer expectations. Additionally, Repo (2023) highlighted the importance of procurement risk management in ensuring regulatory compliance, product quality, and supplier reliability. This aligns with the study's findings that state corporations place significant focus on compliance and supplier integration to enhance firm performance. Firms that effectively assess procurement risks are better positioned to maintain supplier trust and deliver high-quality services, which ultimately strengthens operational efficiency.

Furthermore, Chaudhuri et al. (2020) argued that customer satisfaction and innovation strategies are crucial for sustaining competitive advantage. This supports the study's observation that commercial state corporations continuously seek to improve service efficiency and responsiveness to customer needs. Their research suggests that companies that integrate innovation into their supply chain operations tend to perform better in dynamic business environments, reinforcing the importance of adopting innovative strategies to enhance firm performance. Overall, the findings suggest that commercial state corporations in Kenya have implemented structured strategies to improve financial sustainability, service quality, and customer satisfaction. However, continued investment in compliance measures, service efficiency, and innovation is essential for maintaining long-term competitiveness and operational success.

Correlation Analysis

This section presents the correlation analysis to examine the strength and direction of the relationships between supply chain risks (distribution channel risks, and supplier integration risks) and firm performance. While the descriptive analysis provided insights into respondents' perceptions, it is essential to assess the actual associations between these variables to determine their impact on firm performance. Using the Pearson correlation coefficient (r), the analysis measured associations on a scale from -1 to +1, where values above 0.7 indicate a strong correlation, values between 0.5 and 0.7 indicate a moderate correlation, and values between 0.3 and 0.5 indicate a weak correlation (Cohen, 1988). A positive correlation suggests that as one variable increases, the other also increases, whereas a negative correlation implies that as one variable increases, the other decreases. Table 4.9 presents the correlation analysis findings for this study.

Table 4.4: Correlation Analysis Findings

		Firm Performance	Distribution Channel Risks	Supplier Integration Risks
Firm Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	131		
Distribution Channel Risks	Pearson Correlation	-.692**	1	
	Sig. (2-tailed)	.000		.
	N	131	131	
Supplier Integration Risks	Pearson Correlation	-.725**	.317	1
	Sig. (2-tailed)	.000	.123	
	N	131	131	131

The correlation analysis in Table 4.4 indicates a strong negative relationship between firm performance and distribution channel risks (r = -0.692, p = 0.000), suggesting that as distribution risks increase, firm performance declines. This highlights the critical role of efficient logistics, transport optimization, and warehouse management in minimizing disruptions within the supply chain. An inefficient distribution system leads to delays in product delivery, increased transportation costs, and supply chain inefficiencies, which negatively affect overall firm performance. These findings align with Kuma (2019), who examined the impact of distribution network inefficiencies in the Ethiopian dairy sector and found that poor logistics management led to market access constraints and increased operational costs. Similarly, Wallace (2023) emphasized that delays in shipment, inadequate transport infrastructure, and uncoordinated distribution strategies significantly hinder firm efficiency and customer satisfaction. Furthermore, Fitzgerald (2023) highlighted that inefficient warehouse placement and unoptimized transport routes lead to higher operational costs and reduced service efficiency. These findings suggest that commercial state corporations should adopt technology-driven logistics solutions, optimize transport routes, and strategically place warehouses to mitigate distribution risks and enhance firm performance.

The strongest negative correlation was found between firm performance and supplier integration risks (r = -0.725, p = 0.000), indicating that firms with high supplier integration risks, such as poor supplier collaboration, lack of compliance monitoring, and inadequate information sharing, experience the greatest negative impact on performance. Supplier integration is crucial for supply chain stability, operational efficiency, and strategic sourcing. Organizations that fail to actively engage suppliers, implement compliance tracking systems, and utilize technology for supplier communication are more likely to experience supply chain inefficiencies and financial losses. This result aligns with Cheruiyot (2018), who found that

lack of supplier integration in Kenyan manufacturing firms led to increased procurement delays, reduced operational efficiency, and higher costs. Similarly, Ali and Gossaye (2023) observed that Ethiopian firms that failed to maintain long-term supplier partnerships and effective collaboration suffered from unstable supply chains and declining financial performance. Additionally, Zhao, Huo, Sun, and Zhao (2023) found that companies that do not integrate suppliers into their production and risk management processes experience higher levels of supply chain disruptions and lower service efficiency. These findings suggest that commercial state corporations should enhance supplier collaboration through digital integration platforms, structured supplier engagement policies, and frequent compliance assessments to minimize supplier-related risks and improve firm performance.

Multiple Regression Analysis

Multiple regression analysis was conducted to examine the combined influence of supply chain risks on firm performance in commercial state corporations. While the descriptive and correlation analyses provided insights into individual relationships, multiple regression analysis offers a comprehensive understanding of how these predictors collectively explain variations in firm performance and the relative contribution of each variable. The regression coefficients provide insights into the individual contributions of supplier integration risks, and distribution channel risks, to firm performance.

Table 4. 5: Regression Coefficients Table

Variable	Unstandardized Coefficient (B)	Standard Error	Standardized Coefficient (Beta)	t-Value	p-Value
Constant	0.412	0.100	-	4.125	0.001
Distribution Channel Risks	-0.372	0.064	-0.680	-5.843	0.000
Supplier Integration Risks	-0.410	0.061	-0.718	-6.724	0.000

The regression equation derived from these coefficients is:

Firm Performance = 0.412 - 0.372 Distribution Channel Risks - 0.410 Supplier Integration Risks

The regression analysis reveals a strong negative impact of distribution channel risks on firm performance (B = -0.372, t = 5.843, p = 0.000), indicating that as distribution risks increase, firm performance declines. This means that a one-unit increase in distribution risks will result in a 0.372 decline in firm performance, holding all other variables constant. Inefficient logistics, high transport costs, poor warehouse placement, and ineffective distribution strategies contribute to increased operational costs, delayed deliveries, and customer dissatisfaction. These findings align with Gill (2012), who argued that poor distribution management leads to unpredictable lead times, excessive transportation costs, and inefficient supply chain operations. Similarly, Manuj and Mentzer (2018b) found that firms that fail to invest in transportation optimization, multimodal logistics, and warehouse network efficiency experience declining service delivery and competitive disadvantage. Furthermore, Kuma (2019) highlighted that poor inventory control and inadequate distribution network management negatively impact business scalability and market penetration. These findings emphasize the need for state corporations to invest in smart logistics, optimize transport routes, and integrate advanced distribution tracking systems to mitigate distribution-related risks and enhance firm performance.

The regression analysis shows that supplier integration risks have the most significant negative impact on firm performance (B = -0.410, t = 6.724, p = 0.000). This means that a one-unit increase in supplier integration risks will lead to a 0.410 decline in firm performance, holding all other variables constant. Weak supplier collaboration, inconsistent compliance monitoring, lack of real-time data sharing, and poor supplier relationship management contribute to supply chain disruptions, cost inefficiencies, and reduced service quality. These findings align with Lee (2021), who found that firms with ineffective supplier integration strategies experience frequent supply chain failures, poor quality control, and delayed service delivery. Similarly, Bozarth et al. (2019) established that companies that fail to engage suppliers in joint planning, performance monitoring, and compliance assessment suffer from increased procurement inefficiencies and lower competitiveness. Additionally, Chaudhuri et al. (2020) highlighted that firms with weak supplier engagement strategies struggle with managing risks related to financial instability, geopolitical uncertainties, and unreliable supply networks. These findings emphasize the need for state corporations to enhance supplier collaboration through digital integration, compliance audits, and real-time supply chain monitoring to minimize supplier-related risks and improve firm performance.

Conclusions

The study concludes that distribution channel risks have a significant negative impact on the performance of commercial state corporations. Organizations that effectively manage transport costs, optimize truck loads, and balance transport modes experience greater service efficiency and reduced operational disruptions. However, firms that struggle with poor warehouse placement and inefficient logistics strategies incur higher costs and delays, which negatively affect performance. To enhance supply chain effectiveness, organizations must continuously refine their logistics networks, leverage data-driven transport optimization, and improve warehouse distribution strategies.

The study confirms that supplier integration risks have the strongest negative impact on firm performance. Firms that actively engage suppliers, track compliance, and leverage real-time data-sharing platforms achieve greater supply chain resilience, reduced delays, and improved operational efficiency. However, challenges related to maintaining updated supplier inventories, ensuring long-term supplier collaboration, and managing supplier financial risks were identified. To mitigate these risks, organizations must invest in digital supplier management systems, enhance supplier relationship frameworks, and establish structured supplier compliance mechanisms.

Recommendations

Distribution Channel Risks

To mitigate distribution channel risks, commercial state corporations should invest in efficient logistics management, multimodal transport strategies, and warehouse optimization. Firms should adopt technology-driven distribution tracking systems to monitor transportation costs, ensure optimal truck loading, and improve last-mile delivery efficiency. Additionally, companies should reassess warehouse placement to ensure proximity to key markets, thereby reducing storage and transportation costs. Implementing predictive analytics for demand forecasting can further enhance distribution efficiency by ensuring timely product availability and reducing bottlenecks in supply chain operations.

Supplier Integration Risks

To address supplier integration risks, state corporations should focus on strengthening supplier engagement through joint planning, digital collaboration platforms, and continuous compliance monitoring. Establishing long-term supplier relationships based on mutual trust and strategic alignment will enhance supply chain stability and operational efficiency. Companies should implement supplier risk assessment frameworks to evaluate potential financial and geopolitical risks that may affect supply continuity. Additionally, investing in cloud-based supplier management systems will improve real-time data sharing and collaboration, ensuring seamless coordination in supply chain operations. Encouraging supplier-driven innovation initiatives can also help firms co-develop new products and process improvements, fostering greater competitiveness and efficiency.

Suggestions for Further Studies

Future research should explore other factors influencing firm performance, such as technological advancements, regulatory frameworks, environmental sustainability, and digital transformation. Additionally, studies could compare public and private sector firms, analyze external shocks like economic crises, and use longitudinal designs to track supply chain risk management over time. A qualitative approach could also provide deeper insights into specific risk mitigation strategies used by commercial state corporations.

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