Lead-time management, information sharing and performance of the motor industry in Zimbabwe

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Abstract

Purpose – This study examines the moderating role of information sharing on the effect of lead-time management on the performance of firms in the Zimbabwean motor industry.

Design/methodology/approach – Data were collected using Likert-based structured questionnaires from a sample of 105 employees in Zimbabwe. In addition, Pearson Correlation, Linear Regression and Moderation Regression analysis were employed to test the relationship between study variables.

Findings – The study found that fixed lead time, preprocessing lead time, processing lead time and postprocessing lead time significantly influence the performance of firms in the motor industry. The results also demonstrate that information sharing moderates the effect of lead-time management on firm performance in the motor industry.

Practical implications – Firms in the motor industry should establish long-term relationships with their suppliers and implement effective communication channels for timely and frequent information exchange regarding production schedules, inventory levels, quality standards and potential disruptions.

Originality/value – The current study aims to contribute to the scientific discourse on lead-time management, information sharing and performance in the motor industry. Furthermore, it extends knowledge on the performance of the motor industry in the African region.

Keywords Lead-time, Performance, Information sharing, Moderation

Paper type Research paper

1. Introduction

In today's dynamic global markets, firms in the motor industry are confronted with a multitude of challenges. To maintain competitiveness, these firms must not only recognize the importance of lead-time management but also coordinate effectively with their supply chain partners to enhance joint performance (Kimwaki *et al.*, 2022). The significance of long lead-times as a prevailing issue in the global economy is well-documented in the business and economic literature (Hemalatha and Annadurai, 2020; Pradeep and Balaji, 2022; Kim *et al.*, 2015). Prolonged lead time variabilities not only disrupt production schedules and inventory management but also increase operational costs, potentially undermining customer trust and satisfaction (Chakrabarty *et al.*, 2018).

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The motor vehicle industry has experienced unprecedented global demand growth over the past decade, capturing the attention of researchers across diverse disciplines. This industry is renowned for its fierce competition, intricate supply chains and demanding customer expectations (Delic and Eyers, 2020). Despite relentless efforts to optimize efficiency, profitability and customer satisfaction by delivering exceptional services, companies in the motor industry grapple with challenges such as delivery delays, inadequate procurement planning and inaccurate lead-time estimations (Junaid *et al.*, 2019). In response to evolving customer preferences, companies must not only offer competitive pricing but also provide high-quality goods and services within reasonable lead times (Saputra and Sunitiyoso, 2021). Within this context, effective lead-time management emerges as a critical factor in sustaining a competitive edge (Abeysekara *et al.*, 2019). It is worth noting that prolonged lead times translate into higher costs, necessitating larger buffers, introducing uncertainty in meeting customer demands and potentially damaging delivery commitments. Alzoubi *et al.* (2022) have highlighted the desirability of shorter lead times for both suppliers and clients, as they can spur demand by reducing delivery times and prices.

The motor industry in Zimbabwe grapples with ongoing challenges in effectively managing lead times, leading to disruptions and delays amid economic volatility and the global impact of COVID-19. These delays in the replenishment of spare parts significantly affect companies' revenue, market share, customer satisfaction and reputation. However, significant research gaps persist in this domain. Most of the existing literature on lead-time management primarily focuses on industries beyond the automotive sector (Bandaly *et al.*, 2016; Heydari *et al.*, 2009; Chung *et al.*, 2018; Chang and Lin, 2019), with limited exploration of how information sharing moderates the impact of lead-time management on performance. Building upon social exchange and resource-based theories, this study aims to contribute to the scholarly discourse on lead-time management, information sharing and the performance of firms in the motor industry. Specifically, the following specific questions are addressed in this study.

(1) Do fixed lead time, preprocessing lead time, processing lead time and postprocessing lead time have a positive impact on performance?

(2) Is the relationship between the dimensions of lead-time and performance moderated by information sharing?

To achieve these objectives, this study follows a structured approach. Firstly, it provides a comprehensive literature review on lead-time management, performance and information sharing. Based on this foundation, hypotheses concerning the antecedents of these concepts are formulated. Subsequently, an empirical study is conducted, involving a sample of 40 registered car assemblers and franchisee establishments in Zimbabwe. Finally, this paper discusses the study's findings, highlights their implications, acknowledges limitations and suggests potential directions for future research.

2. Literature review and hypothesis development

2.1 Theoretical framework

The current study draws on social exchange theory (SET) and resource-based view theory to investigate the relationship between lead-time management, performance and information sharing. SET emphasizes the creation of value and cost reduction through relationship-building between parties (Tanskanen, 2015). Parties involved in social exchanges enhance organizational performance by mutually investing effort and perceiving each other as attractive. On the other hand, resource-based theory focuses on formulating and implementing strategies based on internal and external resources to assess organizational performance probabilities (Espino-

Rodríguez and Padrón-Robaina, 2006). Firms collaborate and share resources to create value and transform their business processes. Traditional purchasing is replaced by strategic purchasing, in which suppliers, buyers and consumers form an interconnected supply chain for value creation. Organizational performance is influenced by the transformation of tangible and intangible resources, including human and social capital, assets and time.

2.1.1 Lead time. Lead time has been defined by researchers in various contexts as a crucial metric for evaluating supply chain performance, inventory management and customer satisfaction. Anand *et al.* (2016) defined the lead time as the time between placing an order and receiving materials. On the other hand, Okyere *et al.* (2015) asserted that lead time is the interval between the receipt of a customer order and the preparation of goods for shipment, with an emphasis on the order-processing and fulfilment phases. They added that lead time encompasses the entire order fulfilment process and is measured from the time an order is placed to when the customer receives it. Likewise, Rüttimann and Stöckli (2022) observed that lead time involves the period from the creation of requirements or the receipt of customer orders to fulfilment, highlighting the various stages, such as production, transportation and delivery. Together, these definitions underscore the elapsed time across multiple stages within the order-fulfillment process, such as order processing, production, transportation and delivery. The dimensions of lead-time management include fixed lead time, preprocessing lead time, processing lead time and postprocessing lead time (Angius and Colledani, 2020; Roy and Sana, 2021; Rüttimann and Stöckli, 2022).

2.1.2 Fixed lead time. The time required to gather customer information and provide a response is commonly referred to as the fixed lead time (Glock *et al.*, 2020). As businesses transition from traditional mass production to customized offerings, maintaining a consistent fixed lead-time becomes important for effective operational control. Cotteleer and Bendoly (2006) suggested that a fixed lead time can help reduce variability and improve order-fulfillment rates. They highlighted that a consistent fixed lead-time enables better resource allocation and synchronization of production processes, resulting in enhanced operational efficiency. Bourland *et al.* (1996) found that fixed lead time allows companies to optimize inventory levels and minimize the risks of stockouts or excess inventory. Additionally, they explained that a fixed lead time promotes better coordination between suppliers and buyers, leading to improved supply chain performance. Ponte *et al.* (2018) suggested that fixed lead time can reduce transportation costs and enhance delivery reliability. It is important for fixed lead time to be closely linked to material requirements and production planning to ensure prompt processing of customer orders and improve organizational performance.

2.1.3 Preprocessing lead time. The preprocessing lead time refers to the duration or amount of time required before the actual production or manufacturing process begins (Alzoubi *et al.*, 2022). Preprocessing lead-time influences businesses' ability to promptly respond to customer demands, optimize production schedules and maintain appropriate inventory levels (Karimi, 2018). Preprocessing activities can vary depending on the specific industry and context but generally involve activities such as order processing, raw material sourcing, quality control checks, design and engineering preparations and any other necessary preproduction steps. Reducing the preprocessing lead time has been highlighted in several studies as crucial for enhancing operational performance and gaining competitive advantages. Factors affecting preprocessing lead time include procurement processes, supplier lead times, material availability, production planning and scheduling and internal coordination within the organization (Srivastava, 2007). Preprocessing lead time directly impacts delivery performance, customer satisfaction, on-time delivery, production cycle time and inventory levels (Alzoubi *et al.*, 2022). By reducing preprocessing lead time, businesses can improve performance across these dimensions, resulting in cost savings, increased customer loyalty and enhanced overall supply chain performance (Roy and Sana, 2021).

2.1.4 Processing lead time. Processing lead time refers to the duration required to complete the manufacturing or production process of a product or service within a supply chain (Hasebe *et al.*, 2020). It represents the time taken to transform raw materials or inputs into finished goods or deliverable services. Processing lead time encompasses various activities, such as manufacturing, assembling, testing, packaging and quality control, depending on the nature of the product or service (Richey *et al.*, 2022). Schmidt (2021) pointed out that shorter lead times yield effective results in client-oriented businesses, reducing work-in-process and expediting the production cycle. In situations where clients' lead times exceed production and delivery flow times, make-to-order (MTO) production becomes a viable solution. The significance of processing lead time lies in its impact on operational efficiency, customer satisfaction and overall supply chain performance (Transchel and Hansen, 2019).

2.1.5 Post-processing lead time. The postprocessing lead time is the amount of time needed to finish extra tasks or activities after a product has undergone its primary processing or manufacturing stage. It stands for the interval between when the primary production process is finished and when the product is prepared for delivery or other distribution (Noorwali *et al.*, 2022). Eyers *et al.* (2022) explained that postprocessing lead time encompasses activities following the main production process, such as inspection, testing, packaging, labeling and transportation. Effectively managing postprocessing lead time is crucial for organizations to meet customer expectations, reduce costs and enhance overall supply chain performance (Alzoubi *et al.*, 2022).

2.1.6 Performance. Organizational performance is determined by a company's ability to achieve its market objectives and operational targets (Taouab and Issor, 2019). They added that performance can be assessed using a set of nonfinancial and financial factors. Financial performance evaluates the effectiveness of a company's primary business activities in generating income (Jihadi *et al.*, 2021). The added financial indicators primarily focus on profitability indicators such as return on investment (ROI), working capital ratio, gross profit margin and net profit after tax. On the other hand, Tuan (2020) asserted that nonfinancial performance encompasses long-term operational goals aimed at enhancing the company's image, productivity, growth, market share and customer satisfaction. This study evaluates organizational performance using financial, marketing and shareholder value metrics.

2.1.7 Information sharing. Due to its importance in developing strategic supply chain responses, information sharing has drawn a lot of attention, particularly in supply chains (Xie, 2022). Information sharing is a requirement for knowledge exchange, and a good relationship between the buyer and the supplier is essential to improving the supplier's operational performance (Firmansyah and Siagian, 2022). Similarly, Chen (2022) argued that information creates connections between supply chain participants that can be used to coordinate all actions. Companies must implement methods for making quick judgements based on new information to respond quickly to market changes (Bhatt *et al.*, 2010). They added that the ability to react to the changing dynamics and nature of contemporary competitive marketplaces is made possible by information sharing, more specifically. Information sharing should be evaluated based on its content and quality (Chen, 2022). Sutduean *et al.* (2019) also stated that if businesses and their supply chains want to be competitive, they must invest heavily in information technologies like enterprise resource planning, electronic data exchange and the internet.

2.1.8 Development of hypotheses and conceptual framework. There is scant literature on the relationship between a fixed lead time and performance. Scholars have argued that fixed lead time processes resemble customer order management processes (Chenini *et al.*, 2021). Effective and proper creation, processing and sorting of customer orders reduces demand variability and minimizes quotation processing times, leading to improved financial, marketing and shareholder value for an organization (Kamau and Kagiri, 2015). In addition, fixed lead times enable organizations to streamline processes, reduce idle time and optimize resource allocation, thereby enhancing overall efficiency (Lyu *et al.*, 2020). Tarigan *et al.* (2021) observed that with a predefined duration for order fulfilment, organizations can better plan production schedules, manage inventory levels and coordinate with their suppliers, resulting in reliable delivery and improved customer satisfaction. A fixed lead time facilitates synchronization among suppliers, manufacturers and distributors within a predictable time frame, leading to reduced order processing time, minimized delays and improved supply chain performance (Saxena *et al.*, 2009). Although some argue that a fixed lead time may hinder an organization's agility and responsiveness to unexpected changes or market demands, the literature suggests that by adopting agile and responsive practices alongside a fixed lead time, organizations can strike a balance between stability and flexibility (Nawanir *et al.*, 2020). Therefore, the following is hypothesized.

H1a. Fixed lead time has a positive effect on performance.

Preprocess lead-time involves coordination of order shipping, order listing procedures and order picking irregularities (Tang *et al.*, 2018). Coordinating order shipments and ensuring the availability of the right quantities of inventory at the right time enables an organization to lower stockholding costs through high inventory turnover, high throughput and reduction of order-picking irregularities (Ogbo *et al.*, 2014). In addition, uncertainty in the preprocessing stage can lead to increased inventory costs and unstable production and service levels, which directly affect the overall performance of the organization (Kurdhi *et al.*, 2021). Organizations should endeavor to reduce preprocessing lead times to improve their performance. Gochel *et al.* (2022) established that acquiring and delivering the required materials within the shortest lead time for the next production stage significantly affects organizational performance through cost savings, reduced costs and production costs. Gitonga and Kihara (2016) observed that organizations with shorter preprocessing lead times experienced higher on-time delivery rates and improved customer satisfaction. A shorter preprocessing lead time reduces the need for excessive inventory, minimizes holding costs and lowers the risk of obsolescence (Alzoubi *et al.*, 2022). Therefore, the following is hypothesized.

H1b. The preprocessing lead time has a positive effect on performance.

There is scant literature on the relationship between processing lead-time and performance. The processing, assembling or production stage consists of a series of interlinked activities that consume organizational resources to meet consumers' needs or organizational goals (Chenini *et al.*, 2021; Alzoubi *et al.*, 2022). The organization's ability to utilize its assets and generate revenue depends on its production efficiency. Patil *et al.* (2021) claim that the processing lead time can make or break the business. They further explained that when the processing stage is managed well, it contributes to the organization's success through reduced cost, increased revenue, better investment and capabilities. Scholars such as Szaller and Kádár (2021) claim that by reducing processing or manufacturing lead-time, organizations can enhance customer responsiveness. Thus, the time taken to assemble a product directly affects customer satisfaction, sales and profitability. In addition, reducing processing lead-time enables an organization to increase its productivity, particularly during times of high demand. Therefore, the following is hypothesized.

H1c. Processing lead-time has a positive effect on performance.

The literature consistently supports a positive relationship between postprocessing lead time and organizational performance (Alzoubi *et al.*, 2022). Gitonga and Kihara (2016) emphasized that order picking, packaging, transportation and scheduling play a crucial role in enhancing organizational performance. Similarly, Mkansi and Nsakanda (2021) further highlight that competitive advantage can be gained through efficient order picking, packaging and transportation. Additionally, postprocessing lead time significantly influences the sales interface, particularly in online order placement, where organizations can interact with customers (Benioudakis *et al.*, 2022). Siagian *et al.* (2021) explained that minimizing customer waiting periods enhances satisfaction and subsequently improves organizational performance. A shorter processing lead time improves order fulfilment rates and reduces order backlogs, leading to enhanced operational performance in manufacturing organizations (Alzoubi *et al.*, 2022). Fonseca and Azevedo (2020) explained that organizations with shorter lead times achieve higher profitability due to improved operational efficiency and reduced costs. Therefore, the following is hypothesized.

H1d. Postprocessing lead-time has a positive effect on performance.

The role of information sharing in lead-time management and firm performance is well documented in theoretical and empirical literature. Social exchange theory explains that the willingness to share information is a vital element in social exchanges that involves building trust, promoting collaboration and enhancing mutual understanding (Coyle-Shapiro and Diehl, 2018; Kumar *et al.*, 2021). The theory also proposes that individuals and organizations seek to maintain equity or fairness in their relationships such that if they consistently share information without receiving anything in return, the relationship may become imbalanced, potentially leading to dissatisfaction or breakdown of the relationship (Pinker, 2017). On the other hand, resource-based theory recognizes that information and knowledge are valuable resources of an organization (Halawi *et al.*, 2005). Firms can acquire valuable information and knowledge through various means, such as research and development, market research and partnerships. As such, effective information sharing can facilitate the acquisition and dissemination of knowledge. Information asymmetry in alliances can harm cooperative performance because the amount of information exchanged in alliances directly influences partners' trust in each other regarding confidential or commercially sensitive data (Ravichandran and Giura, 2019). Moreover, Lockstrom (2023) observed that partners who share information can align their cooperative goals to leverage synergies and effectively manage lead-time variabilities resulting from environmental factors. Information sharing enhances coordination and reduces lead times by ensuring the availability of inventory when needed, thereby improving firm performance (Kanyepe, 2022). Additionally, information sharing enables faster responses to demand fluctuations or supply disruptions and helps identify and mitigate risks associated with longer lead times (Ivanov and Dolgui, 2021). A moderator variable increases or decreases the impact of one variable on the other (Baron and Kenny, 1986). It was identified that effective information sharing improves lead-time management and firm performance, while the presence of information asymmetry exerts a detrimental influence on both lead-time management and firm performance. Consequently, it is anticipated that information sharing will moderate the effect of the proposed dimensions of lead-time management on performance. Therefore, the following is hypothesized.

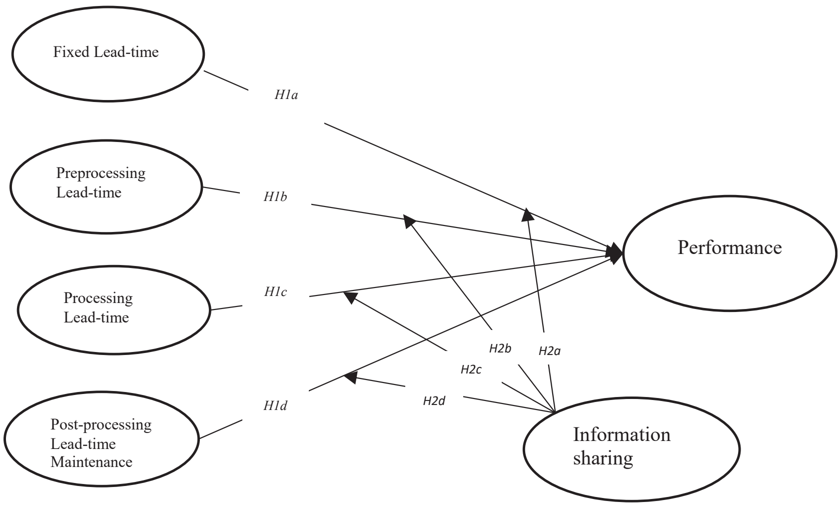
H2a. Information sharing moderates the effect of fixed lead time on performance.

H2b. Information sharing moderates the effect of preprocessing lead time on performance.

H2c. Information sharing moderates the effect of processing lead time on performance.

H2d. Information sharing moderates the effect of postprocessing lead time on performance.

As illustrated in Figure 1, fixed lead time, preprocessing lead time, processing lead time and postprocessing lead time were proposed as dimensions of lead-time management. Performance was treated as the dependent variable, while information sharing represented



Source(s): Author's work

Figure 1. Conceptual framework

the moderating variable. The hypothesized relationships among these variables are also shown in Figure 1.

3. Methods

3.1 Sample and data collection

Data for this study were gathered through a cross-sectional survey between October and November 2022. A sample size of 105 employees (such as managers, supervisors and clerks) was obtained from a population of 144 employees using the RAOSOFT sample size calculator. Simple random sampling was used to select respondents from employees of the forty car assemblers and franchisees in Zimbabwe (Government of Zimbabwe, Ministry of Industry, 2017). Prior to distributing the questionnaires for data collection, permission was sought from each organization. All respondents received a formal invitation to participate in the study and were given clear explanations about the purpose of the study. A structured questionnaire with Likert-type questions ranging from 1 (strongly agree) to 5 (strongly disagree) was used to collect data. Questionnaires were preferred to ensure that the opinions of the researchers were not included in the research data. Items on the structured questionnaire were borrowed from related literature and modified to be in line with the current study. Table 1 shows measurement of variables. Discriminant validity, composite reliability and Cronbach's alpha were conducted to verify the dimensionality and reliability of each construct. Pearson Correlation, Linear Regression and Moderation Regression analysis were used to test the relationship between study variables with the help of SPSS version 22. Moderated regression analysis was used because the regression equation contained interaction elements (the multiplication of two or more independent variables). The use of both analysis techniques is because they want to examine the effect of independent variables on the dependent by being moderated by moderating variable. The study distributed 105 questionnaires and 92 returned and were useable, representing an 87.61% response rate. The demographic information shown in Table 2 indicates that 68.7% of respondents were aged between 30 and 49 years, and 71.2% were males. The respondents' profiles indicate a blended pool (gender and age) of respondents, which provided the study with balanced views.

Variable	Code	Measure	Source
Fixed lead time	FXL1	Our procurement department initiates orders for products within specified timelines	Bourland *et al.* (1996), Cotteleer and Bendoly (2006), Ponte *et al.* (2018), Glock *et al.* (2020)
	FXL2	Our assembly and production teams plan their activities in a timely manner	
	FXL3	Our organization monitors and manages inventory to ensure sufficient stock is available to fulfill orders	
Preprocessing lead-time	PRL1	Our organization values the timely and reliable availability of raw materials and inputs	Alzoubi *et al.* (2022)
	PRL2	Our organization performs preproduction inspections to ensure compliance with production requirements	
	PRL3	There are streamlined order processing and verification procedures	
Processing lead-time	PSL1	The time taken to complete each production task or operation is clearly defined and documented	Alzoubi *et al.* (2022), Richey *et al.* (2022)
	PSL2	Our organization reviews the order details, ensuring accuracy and verifying the availability of the requested items	
	PSL3	The production process is initiated based on allocated resources and coordination with the relevant departments or teams	
Post-processing lead-time	PPL1	Our organization ensures timely completion of assembly, testing and quality control after the initial processing stage	Noorwali *et al.* (2022), Alzoubi *et al.* (2022)
	PPL2	Our organization incorporates the requested modifications or additions as per the customer's specifications	
	PPL3	Our organization continuously monitors all operations in the assembly lines to improve the efficiency	
Information sharing	IS1	Our company collaborates with external partners (e.g. suppliers, dealerships) to share market insights and product information	
	IS1	We actively participate in industry conferences and events to share knowledge and learn from other organizations	
	IS1	There is a culture of open communication within the organization	
Performance	PE1	Our organization consistently meets or exceeds its financial targets	Taouab and Issor (2019), Tuan (2020)
	PE1	We have a high level of customer satisfaction and loyalty	
	PE1	Our organization is known for innovation and high-quality products/services	

Source(s): Author's work

Table 1.
Measurement of variables

4. Results

4.1 Data validation

We performed various tests to validate our data. Composite reliability (CR) and Cronbach's alpha test were used to assess the internal consistency of the items that measured the constructs examined in this study. Table 2 shows that all the variables were reliable, with a Cronbach's alpha above 0.80. According to Zinbarg *et al.* (2005), a Cronbach's alpha of 0.80 or higher indicates that the data gathered are reliable, have relatively high internal consistency and can be generalized to reflect the opinions of all respondents in the target population. In addition, factor analysis results showed that the loadings of all items were above the cut off value of 0.5 (Hair *et al.*, 2014). Moreover, Table 3 shows that the factor loadings were all above 0.6, and the average variance extracted (AVE) values were all above 0.5 (Hair *et al.*, 2014).

Characteristics		Frequency	Percentage (%)
Gender	Male	66	0.712
	Female	26	0.288
Age	19 and below	–	–
	20–29	21	0.230
	30–39	39	0.425
	40–49	24	0.262
	50 and above	8	0.083

Source(s): Author's work

Table 2. Demographic information

Constructs	Variables	Mean value	Standard deviation	Cronbach's alpha	CR	AVE	Factor loadings
FXL	–	–	–	0.93	0.94	0.666	–
	FXL1	3.78	0.782				0.782
	FXL2	4.05	0.744				0.744
	FXL3	3.81	0.815				0.815
PRL	–	–	–	0.94	0.89	0.712	–
	PRL1	4.22	0.744				0.777
	PRL2	3.81	0.815				0.714
	PRL3	3.78	0.782				0.825
PSL	–	–	–	0.91	0.93	0.745	–
	PSL1	4.02	0.815				0.660
	PSL2	4.10	0.782				0.811
	PSL3	3.70	0.744				0.718
PPL	–	–	–	0.94	0.90	0.679	
	PPL1	3.78	0.782				0.682
	PPL2	4.13	0.744				0.804
	PPL3	4.11	0.815				0.635
PE	–	–	–	0.96	0.92	0.654	–
	PE1	4.72	0.744				0.842
	PE2	3.87	0.815				0.644
	PE3	3.91	0.782				0.810
IS	–	–	–	0.91	0.88	0.698	–
	IS1	3.89	0.815				0.682
	IS2	3.78	0.782				0.704
	IS3	3.94	0.744				0.817

Note(s): FXL = Fixed lead-time; PRL = Preprocessing lead-time; PSL = Processing lead-time; PPL = Postprocessing lead-time; PE = Performance; IS = Information sharing
Source(s): Author's work

Table 3. Reliability and construct validity test

In addition, a multicollinearity test was performed using correlation statistics to check if the strength of the relationship between the variables would affect further statistical analysis. As recommended by Hair *et al.* (2014), the correlation statistics should not exceed 0.7 for the method to be robust. As shown in Table 4, all the variables are within the ranges suggested by Hair *et al.* (2014).

4.2 Regression analysis

We used multiple regression analysis to test the relationship between study variables. Statistical Package for Social Sciences (SPSS) version 25 was used to code, enter and compute measurements for the multiple regressions.

Table 5 shows the effect of different dimensions of lead-time management on the performance of firms in the motor industry through a regression test. The value for R^2 shows the effect of the independent variable on the dependent variable. Our findings indicate that there is a strong positive relationship ($R^2 = 0.760$) between fixed lead time and performance. This means a change in fixed lead time will result in a 76% change in performance. The study shows that (β = 0.860, t = 4.405), implying that 86% of the change in performance is only due to fixed lead, while the remaining 14% can be explained by other variables that were not included in the model and the chance of variations. In addition, the findings indicate that there is a strong relationship ($R^2 = 0.871$) between preprocessing lead time and performance. This means the change in preprocessing lead time will bring 87.1% change in performance. In addition, the study shows that (β = 0.910, t = 4.032), implying that 91% of the change in performance is only due to preprocessing lead time, while the remaining 9% can be explained by other variables that were not included in the model and the chance of variations. Moreover, the findings indicate that there is a statistically significant relationship ($R^2 = 0.901$) between processing lead time and performance. This means the change in processing lead time will bring 90.1% change in performance. The study also shows that (β = 0.871, t = 4.279), indicating that 87.1% change in performance is only due to processing lead time, while the remaining 12.9% can be explained by other variables that were not included in the model and

	FXT	PRL	PSL	PPL	PE	IS
Fixed Lead-Time (FXL)	1					
Preprocessing lead-time (PRL)	0.451**	1				
Processing lead time (PSL)	0.418**	0.411**	1			
Post-processing lead time (PPL)	0.407**	0.319**	0.408**	1		
Performance (PE)	0.336**	0.285**	0.226**	0.246**	1	
Information sharing (IS)	0.385**	0.402**	0.303**	0.350**	0.336**	1

Note(s): **Correlation is significant at the 0.01 level (2-tailed)
Source(s): Author's work

Table 4.
Correlation matrix

Model	R^2	β	t	Sig	Decision
Fixed lead time (FXL)	0.760	0.860	4.405	0.000	Supported
Preprocessing lead-time (PRL)	0.871	0.910	4.032	0.000	Supported
Processing lead time (PSL)	0.901	0.871	4.279	0.000	Supported
Post-processing lead time (PPL)	0.867	0.859	4.146	0.000	Supported

Note(s): Dependent Variable: Performance
Source(s): Author's work

Table 5.
Regression test

the chance of variations. Furthermore, the findings indicate that there is a significant relationship (R^2 = 0.867) between preprocessing lead time and performance, suggesting that a change in postprocessing lead time will bring 86.7% change in performance. The study also shows that (β = 0.859, t = 4.146), implying that 85.9% of the change in performance is only due to postprocessing, while the remaining 14.1% can be explained by other variables that were not included in the model and the chance of variations. The significance value was less than 0.05, indicating that the model was significant and a good fit for the collected data. The results presented in Table 6 show the interaction between fixed lead-time (FXL), preprocessing lead-time (PRL), processing lead-time (PSL), postprocessing lead-time (PPL), information sharing (IS) and performance (PE).

Table 6 presents the findings of eight regression models, each tailored to investigate distinct facets of the analysis. Specifically, Models 1, 3, 5 and 7 were developed to determine the effect of fixed lead-time (FXL), preprocessing lead-time (PRL), processing lead-time (PSL) and postprocessing lead-time (PPL) on performance (PE), respectively. Conversely, Models 2, 4, 6 and 8 were developed to analyze the moderating effect of information sharing (IS) on the relationship between the different dimensions of lead time management on performance. The observed shifts in the R-squared (R^2) and β coefficients indicated that the introduction of moderation significantly affect the performance of firms in the motor industry. FXL had (R^2 = 0.760, β = 0.860). However, upon the inclusion of information sharing, these values saw notable increases, culminating in an (R^2 = 0.801, β = 0.875) indicating that the moderation effect of information sharing will enhance performance. Similarly, in the case of PRL, an initial (R^2 = 0.871, β = 0.910) were obtained, but subsequent incorporation of information sharing led to noticeable changes (R^2 = 0.884, β = 0.923) indicating that moderation effect information sharing significantly influence on performance. Moreover, the analysis of PSL revealed an initial (R^2 = 0.901, β = 0.871) increased (R^2 = 0.922, β = 0.892) after testing the moderating role of information sharing suggesting that the moderator indeed influence the relationship between processing lead-time and performance. Moreover, PPL exhibited an initial (R^2 = 0.867, β = 0.859). After the introduction of information sharing both R^2 and β increased to (R^2 = 0.900, β = 0.881) indicating that information sharing has a propensity to enhance the effect on performance. This means that information sharing moderates the effect of postprocessing lead-time management on performance. Furthermore, a comparison of the initial quartet of models (i.e. Models 1, 3, 5 and 7) with the subsequent quartet of models (i.e. Models 2, 4, 6 and 8) shows a substantial decrease in the t-values when the study tested the moderating influence of information sharing. All the eight models had a high level of statistical significance, *p*-value of.000 indicating, that information sharing positively affect performance of firms in the motor industry. This result broadens existing knowledge on the effect of lead-time management on performance.

	Model 1 FXL	Model 2 Int (PE*IS)	Model 3 PRL	Model 4 Int (PE*IS)	Model 5 PSL	Model 6 Int (PE*IS)	Model 7 PPL	Model 8 Int (PE*IS)
R^2	0.760	0.801	0.871	0.884	0.901	0.922	0.867	0.876
β	0.860	0.875	0.910	0.662	0.871	0.892	0.859	0.881
t	4.405	2.031	4.032	3.021	4.279	1.225	4.146	2.001
Sig	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note(s): Dependent Variable: Performance
FXL = Fixed lead-time; PRL = Preprocessing lead-time; PSL = Processing lead-time; PPL = Postprocessing lead-time; PE = Performance; IS = Information sharing
Source(s): Author's work

Table 6.
Moderated regression

5. Discussion and implications

This study aimed to determine the relationship between lead-time management and performance in the Zimbabwean motor industry. The study also explored the moderating effects of information sharing on this relationship. The findings of this study have significant implications for policy development, practical implementation and future research endeavors in the field. The literature on lead-time management has mainly focused on industries outside the motor industry. In addition, few studies have examined the moderating role of information sharing in the relationship between lead-time management and performance. This study contributes to the existing body of literature by being one of the first to investigate these relationships. The study findings established that fixed lead time has a positive effect on the performance of firms in the Zimbabwean motor industry ($\beta = 0.860$, $t = 4.405$). Hence, H1a was accepted. This implies that the time interval taken from the initiation of an order to its fulfilment significantly affects production and inventory-related costs. Moreover, the findings support the view held by several scholars that the effective creation and processing of customer orders reduces demand variability and minimizes order processing times. This in turn enhances an organization's financial, marketing and shareholder value (Kamau and Kagiri, 2015). Similarly, Tarigan *et al.* (2021) observed that with a predefined duration for order fulfilment, organizations can enhance their ability to plan production schedules and manage inventory levels. This, in turn, results in reliable delivery and improved customer satisfaction.

The findings of this investigation also found that the preprocessing lead time has a positive effect on performance ($\beta = 0.910$, $t = 4.032$). Hence, H1b was accepted. This implies that the duration between the initiation of a production order and the start of the production process significantly affects the costs incurred. Against the backdrop of limited empirical evidence on this relationship, this finding provides a novel contribution to the existing body of literature. Scholars such as Patil *et al.* (2021) and Szaller and Kádár (2021) have pointed out that preprocessing activities such as sourcing raw materials, conducting quality checks, configuring machinery or equipment, arranging workstations and ensuring that all necessary components are available for production influence costs. On the other hand, the study found that processing lead time positively influences the performance of firms in the motor industry ($\beta = 0.871$, $t = 4.179$). Hence, H1c was accepted. This result signifies that the time taken to transform raw materials into finished or semifinished products influences the costs and customer service level. This finding corroborates the results from Kurdhi *et al.* (2021), who asserted that uncertainty in the preprocessing stage can lead to increased inventory costs and unstable production and service levels. This is also supported by Gochel *et al.* (2022), who established that acquiring and delivering the required materials within the shortest lead time for the next production stage significantly impacts organizational performance through cost savings, reduced costs and reduced production costs. Furthermore, Gitonga and Kihara (2016) observed that organizations with shorter preprocessing lead times experience higher on-time delivery rates and improved customer satisfaction.

The study also established that postprocessing lead time has a positive effect on the performance of firms in the motor industry ($\beta = 0.859$, $t = 4.146$). Hence, H1d was accepted. This finding implies that the time between the completion of the main production process and the product being ready for delivery or further distribution significantly influences performance. This result is supported by Mkansi and Nsakanda (2021), who observed that competitive advantage can be gained through efficient order picking, packaging and transportation of products. Additionally, Fonseca and Azevedo (2020) explained that organizations with shorter delivery times achieve higher profitability owing to improved operational efficiency and reduced costs. Furthermore, the study found that information sharing moderates the relationship between the different dimensions of lead-time management and performance. This implies that information sharing strengthens the relationship between lead-time management and firm performance. This finding validates the social exchange and resource-based view theories on the assumption that information is a valuable resource and that the willingness to share information is a vital element in social exchanges that involve building trust, promoting collaboration and enhancing mutual understanding (Halawi *et al.*, 2005; Coyle-Shapiro and Diehl, 2018). Several studies have emphasized that information sharing is critical to improving supply chain performance (Baah *et al.*, 2022; Firmansyah and Siagian, 2022) and competitive advantage (Mysková and Kuběnka, 2019). Filbeck and Zhao (2020) explained that when trading partners work together to share information about customer demand, they lower the likelihood of customer service failure due to stockouts. Conversely, sharing detailed information about processes, costs and strategies may lead to a loss of competitive advantage, thus undermining firm performance (Rahman, 2018). Given the limited empirical evidence on the moderating role of information sharing on the relationship between the different dimensions of lead-time management and performance, this finding provides a significant contribution to the existing body of literature.

6. Implications for practice

Findings from this study offer insights that policymakers in the motor industry can use to enhance their firm performance. Policymakers should establish long-term relationships with their key suppliers and customers to improve trust and commitment. This can be made possible by establishing effective communication channels that encourage visibility and real-time information exchanges on production, inventory, quality standards and potential disruptions. For instance, firms can adopt technologies such as electronic data interchange (EDI) or supplier portals to facilitate real-time communication with their supply chain partners. In addition, there is a need for joint planning of production schedules and inventory levels to optimize lead-time management and improve customer satisfaction and the financial performance of firms in the motor industry. Moreover, firms should promote transparency by sharing relevant performance metrics, quality data and cost information. This builds trust and enables partners to identify areas for improvement and take corrective measures. This can be made possible by sharing best practices and engaging supplier and cross-functional teams in the production and specification development stages and supplier development. Additionally, firms should regularly monitor and evaluate supplier performance to ensure that spare parts and other services provided consistently meet quality standards, delivery times and cost effectiveness. Furthermore, to maintain healthy buyer-supplier relationships and prevent disruptions, firms should establish effective mechanisms for dispute resolution.

7. Implications for future research

For this study, data were gathered from firms in the motor industry in Zimbabwe. Hence, the generalization of the results of this study is limited. The findings may differ due to geographical context, differences in organizational culture and industry characteristics. Therefore, a similar study needs to be performed in other sectors and geographical contexts to determine whether new findings will be reported. Moreover, the current study tested the moderating role of information sharing in the relationship between lead-time management and performance. Therefore, future researchers may explore other moderating variables, such as supply chain complexity, industry traits, organizational culture and technological capabilities. Future researchers might consider a qualitative approach or may use experimental or longitudinal designs to determine whether more insights would be gained.

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