Logistic and Operation Management Research, Vol.4 No.1 (2025) https://doi.org/10.31098/lomr.v4i1.2988

Research Paper

Correlation Between Assembling to Order and Customer Satisfaction in the South African Automobile Supply Chain Industry

Polycarpe Feussi[1] & Charles Mbohwa[1]

[1] University of South Africa, South Africa

Received : January 04, 2025	Revised : May 15, 2025	Accepted : May 15, 2025	Online : May 30, 2025

Abstract

Supply chain postponement research has mainly focused on inventory management and lead time. The South African car industry is vital for the economy, driving job creation and economic development, thus addressing social issues such as inequality, unemployment, and crime. It is essential to meet client needs and proactively plan for sector growth, as this will create new job opportunities, drive economic progress, and improve the overall quality of life. This study investigates the relationship between assembly and order (ATO) and customer satisfaction in the South African automobile supply chain. Through the administration of a cross-sectional survey incorporating closed-ended questions, we obtained quantitative data from a sample of 375 individuals working at automobile dealerships. This data was then analyzed to evaluate the hypothesis that the ATO strategy can enhance customer satisfaction. Embracing this research is not just beneficial; it is a necessary step toward elevating service quality and fostering industry advancement. The findings revealed that customer input through the process could potentially improve customer satisfaction by improving five service quality variables, namely the tangibles: responsiveness, empathy, assurance, and reliability. Key stakeholders in this supply chain segment must prioritize enhancing customer relationship management and gaining deeper insights into end customers. Using the customer decoupling point with assembly-to-order (ATO) processes, along with targeted marketing and thorough market research, can achieve this goal. Focusing on customer satisfaction fosters loyalty, leading to more efficient marketing and superior relationship tactics, ultimately boosting the South African automobile industry's market share and positively impacting job preservation and creation.

Keywords: *Service Quality, Customer Satisfaction, Customer Loyalty, South African Automobile Market Share.*

INTRODUCTION

The supply chain is a complex network of producers, manufacturers, intermediaries, traders, processors, retailers, and consumers connected by product, service, finance, or information flow to the end customer. Supply chain management orchestrates these elements to enhance value and reduce costs, focusing on sourcing, procurement, conversion, and logistics (Telaumbanua et al., 2023). The automobile supply chain in South Africa is a critical component of the national economy, offering opportunities for growth and innovation. The adoption of assembly-to-order (ATO) practices can enhance consumer satisfaction through increased personalization and flexibility. By meeting the rising demand for customized vehicles, manufacturers can tailor their production to align with consumer preferences, reduce overproduction, and improve supply chain efficiency. However, the logistical challenges associated with the timely delivery of these personalized vehicles (Mockevičienė & Vedlūga, 2024).

The supply chain encompasses several crucial phases, including raw material sourcing, component manufacturing, vehicle assembly, and distribution (Hugos, 2024). ATO establishes a direct connection between assembly processes and customer experience, promoting brand loyalty through customization and improving delivery times (Korhonen, 2022). Effective communication between manufacturers and consumers is vital for building trust and resolving complaints, supported by rigorous quality control measures to ensure consumer satisfaction (Awa et al., 2021)

Corresponding author's email: feussp@unisa.ac.za

Despite available data, customer satisfaction with South Africa's automobile assembly-to-order remains underexplored. This study assesses how this assembly method impacts satisfaction through measurement tools and supply chain processes. This highlights a significant research gap that affects competitiveness and relationship management. Insufficient theoretical insights and depth in the literature, particularly concerning dealership orders and complex datasets, obstruct understanding of customer needs.

This study explores the relationship between ATO practices and customer satisfaction from the supplier's perspective, focusing on South African manufacturers reliant on outsourced components. Effective ATO policies enhance customer satisfaction but also carry risks. This study proposes mathematical models for ATO scheduling to maximize customer satisfaction and evaluates various solution methods through experiments. This research was undertaken to answer the following questions: What is the correlation between the implementation of an "assemble-to-order" (ATO) strategy and customer satisfaction in the South African automobile supply chain industry?

LITERATURE REVIEW

The automobile industry has a big impact on South Africa's economy. Tackling the difficulties associated with network management in the automotive industry of South Africa would enhance the performance of this crucial sector, promoting job creation and sustainability in a nation grappling with a high unemployment rate of 27.5%. Although global research exists on assemble-to-order (ATO) and customer satisfaction, studies specific to the South African automobile supply chain are limited. The unique economic, logistical, and consumer characteristics of South Africa might influence this relationship differently, including infrastructure, import/export factors, and local supplier capabilities. The intricacies of the multi-tiered automobile supply chain and ATO's impact on customer satisfaction may vary because of product value, complex configurations, long component lead times, and established dealer networks. The specific ATO nuances and customer satisfaction in this context have remained understudied.

A 2009 assessment by the SCIR found that participants in the automobile sector in South Africa lack sufficient collaboration and are not responsive to market dynamics or adaptable to changes. Similarly, Naude (2009) argued that the South African vehicle sector faces a major problem in meeting the cost-efficiency, responsiveness, and dependability demands of the developed world's market. Postponement is vital in automotive manufacturing, as it directly influences customer satisfaction. Kisperska-Moron and Swierczek (2011) stressed that supply networks should focus on customer contentment. Flexible strategies like postponement are necessary to align production effectively with customer needs.

Assembly postponement concept as a customer satisfaction enhancer

Postponement is vital in automotive manufacturing, as it significantly affects customer satisfaction. Implementing postponement strategies enhances customer satisfaction in supply chain management. Kisperska-Moron and Swierczek (2011) stressed the importance of prioritizing customer satisfaction in supply networks, arguing that high satisfaction levels require a flexible framework that incorporates postponement strategies.

The Customer Order Decoupling Point

The Customer Order Decoupling Point (CODP) is crucial in the value chain, indicating when a product aligns with a specific customer order. Known as the order penetration point, it distinguishes levels within the supply chain: make-to-stock (MTS), assemble-to-order (ATO), make-to-order (MTO), and engineer-to-order (ETO). This analysis focuses on the assemble-to-order

process initiated by the dealership, which acts as the customer for assemblers in the automotive supply chain (Olhager, 2012).

Customer expectations and value-ology in the automobile supply chain

Feussi (2018) stated that consumer expectations have changed because of manufacturing advancements. This pressure is placed on assemblers to provide distinctive products within a short timeframe. He further disclosed that consumers may now request highly personalized items rather than accept generic ones. These products should not only be priced and delivered on time but also fulfill the customers' expectations, which necessitates their involvement. According to Feussi (2018), the postponement strategy in the automobile supply chain in South Africa refers to the deliberate delay of any activities related to the services or products in the supply network. This delay occurs while waiting to receive customers' orders or, at the very least, the intention to customize the product. This approach differs from manufacturing products in anticipation of future orders.

Kelly et al. (2017) introduced the term "value-ology," which refers to the systematic examination of the value that customers provide. The field of valueology involves the pursuit of maximizing customer value by conducting comprehensive and objective analyses to identify the ways consumers provide value. It also requires a creative ability to develop a customer value proposition that aligns with their expectations. The customer's expectation is the primary factor that determines the value of the customer value proposal, as described in the preceding paragraphs. To fulfill this expectation, the provider must possess exceptional customer relationship management that incorporates feedback from both customers and end-users.

Theoretical Framework

Research on the ATO assembly strategy's correlation to customer satisfaction in South Africa is limited, particularly regarding studies focused on component suppliers (Halonen, 2021). This study explores this correlation within the South African automobile supply chain from the viewpoint of automobile component suppliers. It identifies relevant theories, including Association Theory, Transaction Cost Theory, and the Theory of Constraints, which provide a foundation for the study (Zhu et al. 2022). The primary goal is to analyze the relationship between the assembly-to-order strategy and customer satisfaction levels in the South African supply chain, as interpreted through these three theoretical lenses.

Assemble-to-order (ATO) manufacturing is a strategy that combines make-to-stock and assembly-to-order methods. It aims to meet customer needs while controlling costs, supporting both high-volume, low-variety and low-volume, high-variety products (Ghasemi et al., 2024; Korhonen, 2022). This study assesses the relationship between ATO in the South African automotive industry and customer satisfaction. The automotive supply chain, which supplies vehicles and components to local and international OEMs, is crucial for the growth of the industry.

In this study, the SERVQUAL model was employed to effectively gauge and measure customer satisfaction levels and perceptions. Customer satisfaction has become a business philosophy, focusing on research and design processes to raise satisfaction levels (Lepistö et al., 2024). Aligning customer satisfaction theories with goal-oriented design languages is crucial for defining and enhancing customer satisfaction. Customers view satisfaction as the degree of discrepancy between their expectations and the perceived performance of the service (Uzir et al., 2021). Service providers view satisfaction as a process in which a service recipient evaluates the service received and compares it with expectations (Kelly et al. 2021). In the automobile supply chain industry, a vehicle manufacturer may be dissatisfied if a vehicle supplier fails to deliver the agreed vehicle on time, while a vehicle supplier may be dissatisfied if the delay exceeds a specific

time threshold.

RESEARCH METHOD

The main aim of developing a detailed research methodology was to adequately assist both the overarching objective and the specific research inquiries of a study focused on examining important elements (Boson et al., 2023). Quantitative research methodology is essential for exploring and evaluating supply chain management practices. These practices are crucial for understanding their impact on achieving a competitive edge in today's dynamic business environment. Adopting this methodology is imperative for success in the modern marketplace (Menesha & Mwanaumo, 2023).

The cross-sectional quantitative study method, which uses an explanatory design, enhances data collection. This methodology utilizes a detailed questionnaire with a three-point scale (Yes-1, Unsure=2, and No=3) related to customer decoupling points in the supply chain, serving as a scientifically tested instrument for postponement strategy. The questionnaire was adapted from the SERQUAL questionnaire by Parasuraman et al. (2002). The validity of the questionnaire was tested using Cronbach's alpha, which yielded a score of 0.985 for the ATO items. The chi-square tests, the crosstabulation, and Cramer's V correlation were used to establish the correlation between ATO and customer satisfaction using SPSS version 23. This study highlights the importance of understanding the impact of ATO on customer satisfaction in the South African automotive supply chain industry. A random sample of 375 customers was collected from a diverse supply chain, grouping customers according to their companies. Sample distribution by business size was carefully based on random sampling techniques to ensure a more representative selection. The Slovin formula was employed to calculate the sample size for the survey research, considering the substantial population of nearly 10,000 individuals and an error margin of 5%. the formula is $n = N / (1 + Ne^2)$. Where n = the required sample size, N = the total population size of automobile industry employees, and e = the margin of error (expressed as a decimal).

This study focuses on the impact of ATO on customer satisfaction in the South African automobile supply chain industry. The independent variable was the ATO environments created by the respondents, and the dependent variable was customer satisfaction. The research design emphasizes the need for increased research on supply chain and component manufacturers in South Africa because they face pressure to improve their competitiveness through upgraded technology (Neboh & Mbhele, 2021).

FINDINGS AND DISCUSSION

This section presents the research's significant findings and then presents a detailed discussion of these findings and their implications. The table presents demographic data obtained from a survey involving 375 respondents, categorized by gender, race, age, and income levels. The gender distribution reveals that female respondents are in the majority, representing 51% of the total, while male respondents account for 46%, and those identifying as other genders make up 3%. This distribution indicates a near-equal representation of genders, with a slight majority of females. In terms of racial demographics, the survey shows that most respondents identify as White (45%), followed by African respondents (30%. Indian respondents constitute 14%, while Colored individuals and those of other races account for 7% and 4%, respectively. This composition demonstrates a degree of racial diversity in the survey sample, although it is predominantly composed of White individuals. Regarding age demographics, a substantial portion of respondents were younger, especially those aged 26 to 35, who represented 32% of the sample, followed by 25% aged under 25. In contrast, the older demographic is less represented, with only 8% of respondents aged over 55 years. This trend indicates a significant bias toward younger respondents. Finally, the income distribution analysis reveals that the largest group of respondents falls within the middle-

income category (61%), followed by low-income individuals (25%, and high-income respondents (14%. This result indicates variability in the economic backgrounds of the survey respondents, with the majority aligned with middle-income status.

Table 1. Demographic results

Variable	Respondents Category	N=Counts	Respondents Percentage
Gender	Male	173	46%
	Female	191	51%
	Others	11	3%
	Total	375	1
Race	White	169	45%
	African	113	30%
	Indian	52	14%
	Colored	26	7%
	Others	15	4%
	Total	375	1
Age	25 years	94	25%
	26–35 years	120	32%
	36–45 years	79	21%
	46–55 years	52	14%
	Above 55 years.	30	8%
	Total	375	1
Income level	High	52	14%
	Midle	229	61%
	Low	94	25%
	Total	375	1

The dealership was the subject of quantitative research in which ATO was examined as the independent variable and customer happiness as the dependent variable, with consideration given to the company's size. Research has revealed a positive correlation between smaller firm sizes and the notion that more consumer involvement leads to greater satisfaction levels. Customers' contributions to the process and goods lead to a deeper comprehension of their expectations and stronger alignment, resulting in a greater level of providers satisfying those goals.

Table2. Crosstab: Business size * Accessories according to the clients' preferences, enhancing sincerity and accuracy.

		Accessories that enhance sincerity and accuracy according to client preferences			Total
		Yes	Unsure	No	
Business size	Small	136	16	12	164
	Medium	190	0	7	197
	Big	14	0	0	14

	Accessories that enhance sincerity and accuracy according to client preferences			Total
	Yes	Unsure	No	
Total	340	16	19	375

Small businesses in South Africa employ between 10 and 49 people, medium-sized businesses employ between 50 and 249 people, and large businesses employ 250 or more people (Ramabitsa, 2022). The cross-tabulation table assesses the relationship between dealership size and assembly postponement (ATO) effects on customer satisfaction regarding reliability. Out of 375 respondents, 340 felt that ATO enhanced their satisfaction. However, 16 smaller dealerships were uncertain about ATO's benefits, with 12 unable to evaluate the benefits effectively. Twelve small firms believed ATO could improve satisfaction, as did seven medium-sized dealerships. The sample comprises 164 small businesses, 197 medium enterprises, and 14 large corporations, capturing diverse perspectives. The chi-square test investigated the link between dealership size and the impact of ATO on customer satisfaction.

Table 3. Chi-Square Tests for Accessories According to Client Preferences, thereby Enhancing Sincerity and Accuracy

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.768[a]	4	.000
Likelihood Ratio	32.276	4	.000
Linear-by-Linear Association	12.741	1	.000
N valid cases	375		
a. 2 cells (22.2%) had an expected count of less than 5. The minimum expected count is .60.			

An analysis using the Pearson chi-square test was used to evaluate the influence of postponement (ATO) on service dependability. The results produced a P-value, which is indicated as Asymp. Sig. (2-sided) in the accompanying table, of 0.000, indicating a statistically significant outcome (P = 0.000 less than 0.001). The computed Pearson chi-square statistic was 25.768, accompanied by 4 degrees of freedom. This result (P = 0.000, less than 0.001) provides compelling evidence against the null hypothesis, which asserts that there exists no correlation between ATO and customer satisfaction, thus endorsing the alternative hypothesis. Given the 4 degrees of freedom, it can be deduced that the eight factors involved in the final statistical assessment are independent and free from variability. The null hypothesis was examined to ascertain whether there is a statistically significant correlation between ATO and the improvement of service dependability, a critical element for dealer satisfaction. The outcome of the test culminated in the rejection of the null hypothesis, indicating that the data did not substantiate its validity.

Table 4. Symmetrical Measures for Accessories according to the customer, improving the visual appeal and being more convenient.

Symmetric Measures.

		Value	Approximate Significance
Nominal by Nominal	Phi	.235	.014
	Cramer's V	.136	.014
N valid cases		375	

The research demonstrates a moderate positive correlation between company size and customer preferences for accessories. The Phi coefficient is 0.235, indicating that larger companies are associated with a higher likelihood of favorable customer preferences for accessories. Conversely, Cramer's V-value of 0.136 indicates a relatively weaker association, suggesting that further context or analysis is necessary. Both statistical measures have a p-value of 0.014, indicating a statistically significant relationship. The sample size of 375 valid cases contributes to the reliability of the findings and strengthens the credibility of the interpretations.

.

Table 5. Business size * Accessories according to customer, improving the visual appeal, and being more convenient.

		Accessories according to the customer, improving the visual appeal and be more convenient			Total
		Yes	Unsure	No	
Business size	Small	132	24	8	164
	Medium	188	0	9	197
	Big	14	0	0	14
Total		334	24	17	375

Table 5 illustrates the connection between the size of dealerships and the effect of assemble-to-order (ATO) on customer satisfaction levels. Among the 375 individuals surveyed, a noteworthy majority—totaling 334—indicated that ATO could increase customer satisfaction. In contrast, 24 smaller dealerships showed some uncertainty about the matter, while 8 stated they could not respond. Specifically, out of the responses, 8 small businesses and 9 medium-sized companies highlighted the possibility for the assemble-to-order ATO to improve its performance with measurable customer satisfaction outcomes. The research involved a sample of 375 respondents, including 164 small businesses, 197 medium enterprises, and 14 large corporations. A chi-square analysis was conducted to examine whether there was a significant relationship between the size of the dealership and the improvement of customer satisfaction as influenced by initiatives from assemble-to-order (ATO).

Table 6. Chi-Square Tests Accessories according to the customer, improving the visual appeal and making it more convenient.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.995[a]	4	.000
Likelihood Ratio	43.468	4	.000
Linear-by-Linear Association	10.774	1	.001
N valid cases	375		

a. 2 cells (22.2%) had an expected count of less than 5. The minimum expected count is .63.

A Pearson chi-square test was performed to evaluate how ATO affects the tangible service improvement, as outlined in the table above. The table's Asymp. Sig. (2-sided) P value of 0.000 demonstrates a significance level of less than 0.001, highlighting compelling findings. With 4 degrees of freedom and a Pearson chi-square value of 33.995, the result (P = 0.000 <0.001) strongly rejects the null hypothesis, which states that ATO has nothing to do with customer satisfaction. This gives a lot of support to the alternative hypothesis. Four degrees of freedom indicate that the statistical analysis's four variables are independent and do not affect each other. The null hypothesis was tested to determine if there is a statistically significant link between postponement (ATO) and the improvement of tangible service, a vital aspect of dealer satisfaction. These findings reject the null hypothesis and highlight the significant relationship between ATO and service enhancement.

Table 7. Symmetric Measures Accessories fitting according to the Customers' Preferences, enhancing interaction and respect.

Symmetric Measures			
		Value	**Approximate Significance**
Nominal by Nominal	Phi	.131	.693
	Cramer's V	.076	.693
N valid cases		375	

The analysis shows a weak positive correlation between company size and customer preferences for accessory fittings, as indicated by a Phi coefficient of 0.131. However, the high p-value of 0.693 signals a lack of statistical significance. The Cramer's V statistic of 0.076 supports this weak association, with the same p-value indicating that the relationship is not statistically significant. Based on 375 valid cases, the findings suggest caution when interpreting weak correlations. A larger sample size is essential for more credible conclusions, and further investigation could enhance understanding of customer preferences.

Table 8. Business size * Accessories fitting according to customers' preferences to enhance interaction and respect.

		Accessories fitting according to customer preferences, enhancing interaction and respect.			Total
		Yes	Unsure	No	
Business size	Small	116	36	12	164
	Medium	170	9	18	197
	Big	10	0	4	14
Total		296	45	34	375

The results presented in Table 7 above reveal a significant correlation between the size of a dealership and the impact of assembly postponement (ATO) on customer satisfaction, with a particular emphasis on the aspect of responsiveness. Out of 375 participants, a substantial majority (296) acknowledged that implementing ATO could considerably enhance customer satisfaction by improving responsiveness. In contrast, 36 smaller dealerships expressed uncertainty about the concept, while 12 felt entirely overwhelmed by it. Furthermore, 34 firms—12 small businesses, 18 medium enterprises, and 4 large corporations—emphasized the need for improvements in customer satisfaction, with a particular focus on responsiveness to ATO. The analysis was derived from a sample of 375 participants comprising 164 small firms, 197 medium enterprises, and 14 large businesses. To explore the relationship between the size of a firm and the boost in customer satisfaction due to ATO, a chi-square test was conducted. This evidence suggests that prioritizing responsiveness through ATO adjustments can elevate customer satisfaction across different dealership sizes.

Table 9. Chi-Square Tests Accessories fitting according to customer preferences to enhance interaction and respect.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	80.072[a]	8	.000
Likelihood Ratio	90.381	8	.000
Linear-by-Linear Association	31.870	1	.000
N valid cases	375		
a. 6 cells (40.0%) have an expected count of less than 5. The minimum expected count is .15.			

Table 8 illustrates the effects of postponement (ATO) on service responsiveness. Using the Pearson chi-square test, the results were significant: the P-value, Asymp. Sig. (2-sided), is 0.000, indicating a statistically significant outcome (P = 0.000, below 0.001). The Pearson chi-square statistic is 80.072, with 8 degrees of freedom, providing strong evidence against the null hypothesis, which claims no link between ATO and customer satisfaction, thus supporting the alternative hypothesis. With 4 degrees of freedom set at 4, the four variables in the statistical evaluation appear to operate independently. The analysis aimed to determine the correlation between postponement (ATO) and improved service responsiveness, which is vital for dealer satisfaction, ultimately leading to the rejection of the null hypothesis.

Table 10. Symmetric Measures

Symmetric Measures				
			Value	Approximate Significance
Nominal by Nominal		Phi	.235	.014
		Cramer's V	.136	.014
N valid cases			375	

The data indicate a significant correlation between company size and the fitting of accessories to customer preferences. The Phi coefficient shows a moderate positive correlation with a significance level of 0.014. Moreover, Cramer's V indicates a weak to moderate association, which is also significant at 0.014. This analysis was based on 375 valid cases, ensuring reliable conclusions. The results suggest that company size affects customer perceptions of accessory fitting, potentially improving interactions and respect within customer relationships.

Table 11. Business size * Accessories fitting according to customer preferences to enhance trust level and support.

		Accessories fitting according to customer preferences to enhance the trust level and support			Total
		Yes	Unsure	No	
Business size	Small	128	12	24	164
	Medium	162	25	10	197
	Big	10	0	4	14
Total		300	37	38	375

In an analytical examination of the relationship between dealership size and the impact of assembly postponement (ATO) on customer satisfaction, cross-tabulation was employed. Out of 375 respondents, 300 indicated that ATO could enhance their satisfaction levels. The study included a small sample of 12 minor dealerships, each of which could support a maximum of 24 individuals, indicating their limited influence. The sample comprises 375 entities, categorized into 164 small firms, 197 medium-sized enterprises, and 14 large corporations. The chi-square test was applied to assess the correlation between the size of the dealership and the degree of customer satisfaction improvement attributed to ATO.

Table 12. Chi-Square Tests Accessories fitting according to customer preferences to enhance trust level and support.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	52.195[a]	6	.000
Likelihood Ratio	61.573	6	.000
Linear-by-Linear Association	25.256	1	.000
N valid cases	375		
a. 3 cells (25.0%) had an expected count of less than 5. The minimum expected count is .90.			

The data presented in the table compellingly highlights the significant benefits that postponement (ATO) brings to service assurance. Our detailed Pearson chi-square test yielded robust insights: the P-value is indicated as Asymp. Sig. (2-sided) In the table, it stands at an impressive 0.000 (<0.001). With 6 degrees of freedom and a Pearson chi-square value of 52.195, these results strongly reject the null hypothesis, which states that there is no link between ATO and customer satisfaction. This strongly supports our alternative hypothesis. There is no doubt that the analysis of four degrees of freedom reveals that the six variables in our large statistical analysis are independent and consistent. The research scrutinized the null hypothesis to identify the statistical link between postponement (ATO) and the enhancement of service assurance, crucial for dealer satisfaction. The dismissal of the null hypothesis not only confirms our findings but also underscores the vital role of ATO in fostering improved service assurance.

Table 13. Symmetric Measures Accessories fitting according to customer preferences, enhancing the trust level, and enhancing the support.

Symmetric Measures			
		Value	Approximate Significance
Nominal by Nominal	Phi	.122	.781
	Cramer's V	.070	.781
N valid cases		375	

The analysis investigates the symmetrical relationships between company size dimensions and the alignment of accessory products with consumer preferences. The findings, indicated by the Phi coefficient and Cramer's V, reveal a weak positive correlation, achieving a significance level of 0.781 across a dataset of 375 valid instances. This implies that company size has a negligible effect on customer perceptions of the suitability of accessories. The absence of a notable correlation recommends that businesses should focus on fostering customer trust and engagement through enhancements in product quality and service and by actively seeking consumer feedback. Cultivating sustained customer loyalty may necessitate a more customized approach that emphasizes a deeper understanding of customer preferences rather than relying on company size indicators.

The results of this study have practical implications for the automobile supply network, suggesting the need for improved communication within the supply chain, especially with end users who are vital for business survival. The Fourth Industrial Revolution (4IR) poses challenges, with South African banks facing layoffs that could also impact the automotive industry as e-commerce rises. The southern African car supply network must adapt to avoid job losses and vulnerabilities due to competitive pressures between dealers and suppliers. Transitioning to online sales of automotive parts and vehicles is critical. Customer satisfaction is essential to drive loyalty beyond limited offerings, highlighting the skills gap in South Africa, where unemployment is about 30% (Phakathi, 2023). Prioritizing postponement strategies may enhance customer satisfaction and retention in the automotive sector, which is essential for GDP and job creation. Currently, strategies like engineer-to-order and assembly-to-order approaches fail to adequately address end users. The make-to-stock method failed to accommodate end-user input. The 4IR presents an opportunity for more extensive consumer engagement through customer surveys and market research to align with consumer expectations for improved value and loyalty. This research suggests improving customer satisfaction by tailoring a postponement strategy to income levels, employment status, and age, with a particular focus on middle-income groups and adults aged 25 to 45.

It is true that the postponement strategy ATO (Assemble to Order), does not always guarantee improved service quality. The analysis of data from various service providers revealed no significant link between changes in postponement practices and measurable improvements in service quality metrics (Prataviera et al. 2024). This suggests that postponing does not enhance the service quality. Instead, factors like operational efficiency, employee training, technology integration, and proactive customer engagement are more crucial for boosting service quality (Rau et al., 2021). However, these findings may vary across different industries or situations, as postponement strategies may indirectly improve service quality through other intermediary factors, as found in this research.

Adopting an assembly-to-order (ATO) approach could further improve satisfaction by allowing vehicle customization, reducing wait times, and enhancing the quality through standardization. ATOs can optimize inventory costs and pricing by fostering supplier, manufacturer, and distributor collaboration. However, results may vary based on specific contexts, necessitating more studies for accuracy. Companies should enhance communication, streamline order processing, and create flexible assembly processes in the South African automotive supply chain. Collaborating with suppliers to establish effective communication and quality control measures is crucial. Comprehensive after-sales support is necessary to address post-purchase issues, including warranty services and troubleshooting. By monitoring customer feedback, investing in technology, training staff and fostering a customer-centric culture, consumer satisfaction can significantly improve across the sector. Regular updates, feedback systems, and efficient customer service enhance the understanding of consumer needs and expectations while strengthening workforce skills and expertise.

CONCLUSION

This study thoroughly analyzes the critical relationship between customer satisfaction enhancements and the strategic application of postponement in supply chains, with special emphasis on the ATO methodology. Our hypothesis predicts a strong positive relationship between the integration of postponement strategies—specifically ATO—and heightened customer satisfaction in the automotive sector. To substantiate this hypothesis, we conducted a comprehensive survey involving 374 respondents, selected using the Slovins formula, which facilitated an in-depth data analysis. The results indicate that the proposed ATO approach can significantly improve customer satisfaction by enhancing both service quality and product availability. The framework of Association Theory, Transaction Cost Theory (TCT), and Theory of Constraints (TOC) provides a basis for examining ATO in South Africa's automobile industry. Association theory explains consumer brand preferences, where positive interactions enhance loyalty and encourage repeat business. For OEMs and dealers, applying association theory in marketing fosters-positive brand associations, whereas negative experiences can harm perceptions. Integrating insights from all three theories deepens understanding of elements affecting ATO effectiveness, and a clearer definition of "ATO" would enhance this analysis. In the South African automotive industry, businesses are implementing ATO strategies to improve customer experiences. The ATO Framework provides firms with the ability to tailor and modify processes according to specific customer requirements, leading to notable increases in overall satisfaction. This methodology not only streamlines production workflows and reduces lead times but also minimizes inventory costs. Furthermore, it fosters enhanced communication and collaboration among manufacturers, suppliers, and consumers, thereby ensuring timely delivery of customized vehicles. The adoption of ATO methods not only boosts customer satisfaction but also reinforces brand loyalty and promotes repeat purchases, positioning them as a vital strategy for

organizations aspiring to sustained success.

LIMITATIONS AND FURTHER RESEARCH

This study focused on organizations within the South African automotive industry's passenger vehicle supply chain, resulting in a limited sample size. Participants were all part of the Original Equipment Manufacturers (OEMs) supply chain, including first- to fourth-tier suppliers, component assemblers, and vehicle assemblers, which may restrict the applicability to other manufacturing sectors.

Future research should encompass a broader range of automotive supply chain manufacturers in South Africa, covering all vehicle types, including light, medium, and heavy-duty trucks, buses, and passenger vehicles. This focus may also extend to local manufacturers outside the passenger vehicle sector and similar sectors in other emerging nations.

REFERENCES

Awa, H. O., Ikwor, N. K., & Ademe, D. G. (2021). Customer satisfaction with complaint responses under the moderation of involvement. *Cogent Business & Management, 8*(1), 1905217. https://doi.org/10.1080/23311975.2021.1905217

Boson, L. T., Elemo, Z., Engida, A., & Kant, S. (2023). Assessment of green supply chain management practices on sustainable business in Ethiopia. *Logistic and Operation Management Research, 2*(1), 96–104. http://dx.doi.org/10.31098/lomr.v2i1.1468

Feussi, P. (2018, July). Reviewing postponement in the South African automobile industry: A literature review perspective. In *2nd European International Conference on Industrial Engineering and Operations Management*. https://doi.org/10.46254/EU02.20180411

Ghasemi, E., Lehoux, N., & Rönnqvist, M. (2024). A multi-level production-inventory-distribution system under mixed make to stock, make to order, and vendor managed inventory strategies: An application in the pulp and paper industry. *International Journal of Production Economics, 271*, 109201. https://doi.org/10.1016/j.ijpe.2024.109201

Halonen, J. (2021). *Supply chain management in after sales and subcontract manufacturing processes: Case study: Metso Minerals* [Bachelor's thesis, University of Vaasa]. https://urn.fi/URN:NBN:fi:uva-202109164349

Hugos, M. H. (2024). *Essentials of supply chain management* (5th ed.). John Wiley & Sons.

Kelly, S., Johnston, P., & Danheiser, S. (2017). *Value-ology: Aligning sales and marketing to shape and deliver profitable customer value propositions*. Springer International Publishing. http://dx.doi.org/10.1007/978-3-319-45626-3

Kelly, S., Marshall, D., Walker, H., & Israilidis, J. (2021). Supplier satisfaction with public sector competitive tendering processes. *Journal of Public Procurement, 21*(2), 183–205. https://doi.org/10.1108/JOPP-12-2020-0088

Kisperska-Moroń, D., & Świerczek, A. (2011). The selected determinants of manufacturing postponement within supply chain context: An international study. *International Journal of Production Economics, 133*(1), 192–200. https://doi.org/10.1016/j.ijpe.2010.09.018

Korhonen, T. (2022). *Improving manufacturing throughput times using Assemble-To-Order production model* [Master's thesis, LUT University]. https://urn.fi/URN:NBN:fi:lut-202209214893

Lepistö, K., Saunila, M., & Ukko, J. (2024). Enhancing customer satisfaction, personnel satisfaction and company reputation with total quality management: Combining traditional and new views. *Benchmarking: An International Journal, 31*(1), 75–97. https://doi.org/10.1108/BIJ-12-2021-0749

Menesha, A. H., & Mwanaumo, E. T. (2023). Supply chain management practice and competitive

advantage: Systematic literature review. *Logistic and Operation Management Research, 2*(2), 44–57. https://doi.org/10.31098/lomr.v2i2.1809

Mockevičienė, B., & Vedlūga, T. (2024). Furniture industries: Challenges of regionalisation, customisation and new paradigm of pricing. In *Participation based intelligent manufacturing: Customisation, costs, and engagement* (pp. 47–100). Emerald Publishing Limited.

Naude, M. J. A. (2009). *Supply chain management problems experienced by South African automotive manufacturers* [Doctoral dissertation, University of South Africa]. University of South Africa Institutional Repository.

Neboh, N. D., & Mbhele, T. P. (2021). Supply chain design dimensions for supply chain resilience in the South African fast-moving consumer goods retail industry. *Africa Journal of Management, 7*(sup1), 58–81. https://doi.org/10.1080/23322373.2021.1930742

Olhager, J. (2012). The role of decoupling points in value chain management. In *Contributions to management science* (pp. 37–47). Springer. http://dx.doi.org/10.1007/978-3-7908-2747-7_2

Parasuraman, A., Berry, L., & Zeithaml, V. (2002). Refinement and reassessment of the SERVQUAL scale. *Journal of Retailing, 67*(4), 114.

Phakathi, N. (2023). *Service quality, customer satisfaction and customer retention: A case of private banking in South Africa* [Master's dissertation, University of the Witwatersrand]. https://hdl.handle.net/10539/38829

Prataviera, L. B., Jazairy, A., & Abushaikha, I. (2024). Navigating the intersection between postponement strategies and additive manufacturing: Insights and research agenda. *International Journal of Production Research*, 1–23. https://doi.org/10.1080/00207543.2024.2425785

Ramabitsa, D. L. (2022). *Sustainability of lower-grade construction based SMME's in the Free State Province* (Doctoral dissertation). University of the Free State

Rau, H., Budiman, S. D., & Monteiro, C. N. (2021). Improving the sustainability of a reverse supply chain system under demand uncertainty by using postponement strategies. *Waste Management, 131*, 72–87. https://doi.org/10.1016/j.wasman.2021.05.018

Telaumbanua, K. R., Suhana, S., & Mulyani, R. Y. (2023). Fish supply chain management strategy analysis for Warung Tegal (WarTeg) while COVID-19 policy is enforced in the Administrative City of South Jakarta. *Logistic and Operation Management Research, 2*(1), 83–95. https://doi.org/10.31098/lomr.v2i1.1526

Uzir, M. U. H., Al Halbusi, H., Thurasamy, R., Hock, R. L. T., Aljaberi, M. A., Hasan, N., & Hamid, M. (2021). The effects of service quality, perceived value and trust in home delivery service personnel on customer satisfaction: Evidence from a developing country. *Journal of Retailing and Consumer Services, 63*, 102721. https://doi.org/10.1016/j.jretconser.2021.102721

Zhu, Q., Bai, C., & Sarkis, J. (2022). Blockchain technology and supply chains: The paradox of the theoretical research discourse. *Transportation Research Part E: Logistics and Transportation Review, 164*, 102824. https://doi.org/10.1016/j.tre.2022.102824