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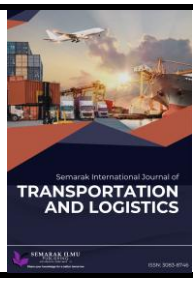

Assessing the Relational Benefits of Logistics Services (LSP) as Perceived by Automotive Manufacturers in Klang Valley using Structural Equation Modelling (SEM)

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ABSTRACT

The increasing significance of logistics activities that extend across the boundaries of supply chain firms highlights the importance of managing relationships within the supply chain. Many automotive companies nowadays find outsourcing logistics functions to be a compelling choice. In the current landscape, a growing number of automotive companies are opting for outsourcing logistics functions. This shift is driven by the desire to attain strategic advantages in logistics with the ultimate goal of cost reduction. As the Malaysian automotive industry continues to grow annually, it is increasingly crucial for car manufacturers and assemblers in Malaysia to establish successful relationships with Logistics Service Providers (LSPs). In alignment with the current marketing concept that prioritizes relational benefits and insights derived from the supply chain management literature concerning consumer satisfaction, this research evaluates logistics service performance perceived by manufacturers. The validation process involves distributing questionnaires to 74 car manufacturing companies in Klang Valley area, achieving a response rate of 52.7%. In this study, the automotive companies are chosen to examine the relative importance of the three identified benefits, Special Treatment, Value Added (VAL), and Collaborative Benefits (COL) using Structural Equation Modelling (SEM) and a new benefit, Loyalty Benefit (LOY), was added to the framework. The contribution of this study includes providing new theoretical insights into the benefits–satisfaction–loyalty triad as applied by manufacturers and logistics service providers (LSPs). It also provides valuable perspectives on how to strategically evaluate logistics providers, aiming to transform a logistics firm from a tactical service provider into a closely integrated strategic partner

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1. Introduction

In the last decade, the emergence of global supply chain has reshaped the role of logistics service in both scale and scope in the automotive industry. Outsourcing logistics functions have become a compelling choice of many automotive companies. In the automotive industry these days, many companies are looking at strategic advantages in logistics to reduce costs. For some, it is a near life-or-death proposition for their survival. The battle zone for these companies is in reducing inventory and supply chain costs at each transaction and for their customers in the field, on the ground and in the trenches.

The automotive industry in Malaysia is growing rapidly, capturing the local and foreign market. Therefore, it is regarded as an essential sector in the Malaysian economy. The economic contribution of this sector is enormous, with significant contributions toward employment, investment and national income. Unfortunately, in recent years the automotive industry is facing significant challenges particularly from trade liberalization and increasing competition. As such, this phenomenon has resulted in a considerable amount of pressure on Malaysian manufacturers to improve productivity and performance in total in order to be more competitive locally and globally. In order to achieve these aims, improving logistics performance appears to be a necessity.

The automotive industry in Malaysia is recognised as one of the important industries that improve the country's economy. It is significant that the local logistics industry in Malaysia began to flourish in conjunction with the proliferation of the national automotive industry with the creation of Perusahaan Otomobil Nasional (PROTON) – Malaysia's first national car maker in the 1980s and with the development of the other car manufacturer and assemblers in Malaysia. Since then, it has been recognised, especially within the Malaysian Government, that the local automotive industry requires further consolidation and strengthening to remain competitive globally [1].

Today a broad group of activities are available to automotive manufacturers that represent logistics services such as inbound material flow management, inventory control, kitting, container management, packaging, reverse logistics, cross-docking, just-in-time delivery, warehousing, and transportation. All of these activities can be performed in-house or outsourced to third-party logistics service providers (3PLSPs). Logistics outsourcing has grown in size and scope over the past 20 years. This has occurred largely because manufacturers across many industry sectors - including automotive - have found it more cost-effective to have third-party experts handle supply chain matters while they focus on competencies more central to their core business. Through the passage of time, many people have forgotten that the roots to logistics outsourcing were actually born within the auto industry.

As the global supply chain becomes more and more complex, manufacturing companies try to ensure reliable and efficient deliveries from their suppliers as well as to their markets and customers. The success of the order fulfil goal relies very much on the services provided by LSPs. According to the Deputy Prime Minister of Malaysia, Yassin [2], *"the car industry in Malaysia needs to be energised and revitalised"*. He added that the industry must focus on operations and cost efficiency to reduce cost, increase productivity and sell more through innovative marketing strategies. Moreover, he announced Malaysia's position as one of Southeast Asia's largest passenger vehicle markets accounting for about half a million vehicles sold annually. Basically, the trend of sales and production of the cars is increasing from year to year [3,4], as can be demonstrated by reference to the total industry volume (TIV) figures obtained from the Malaysian Automotive Association (MAA) press conference report. With the rising automotive sales and the evincing interest of car manufacturers in lowering their production costs, LSPs usage in the Malaysian car industry is expected to increase significantly. To summarise, the Malaysian automotive industry has increased from year to year,

thereby indicating that it is becoming vital for car manufacturers and assemblers in Malaysia to forge successful relationships with LSP.

Generally, it has been recognised that supply chain activity is made up of the material flows chain, which is from the supplier to the manufacturer, manufacturer to wholesaler, wholesaler to retailer, and retailer to the customer. The key argument behind all these terms appears to be that channel members are unable to survive by themselves successfully, and therefore, they need to establish close collaboration with other members in the supply chain [5,6]. As a result, an external party is used to perform certain business functions, such as logistics activity, for these channel members. In this study the inter-firm relationship between buyers and the LSP, also known as the logistics partnership will be explored. The buyer refers to the customer of this LSP, i.e. the organisation that buys the LSP product, which in this research study, refers to transportation activity. In the basic chain, the involvement of the logistics service provider (LSP) is not really clear as this is the party behind the chain. In fact, its roles are important for both the inbound and outbound activity since without logistics, the supply chain activity will not operate effectively, and may fail completely. Hence, this provides the rationale for undertaking the research into the logistics partnerships within the supply chain.

Besides, this research intends to explore the impact of relational benefits existed between automotive manufacturers and logistics service providers (LSP). In this study, automotive manufacturers as the buyers who outsource their logistical functions or purchase logistical services, and LSPs are the suppliers who provide logistical services. More recently, it has been argued that relational benefits perceived by the automotive manufacturers will enable supply chain partners to achieve satisfaction and realize successful outcomes.

The relational benefits literature has been expanded in recent years as both practitioners and researchers realize that understanding the logistical service benefits from customers' perspective is as important as understanding it from the provider's perspective [7,8]. To forge and maintain long-term relationships between service providers and their customers, both sides must benefit from this partnership. In relationship marketing, service providers have moved from merely focusing on fixed transactions to building long term, profitable relationships that consumers perceive to be mutually beneficial (Hsiao *et al.,* [9]). The type of benefits that manufacturers are seeking for through outsourcing logistics operations include cost reduction, delivery quality, value-added services, asset reduction, and collaborative communication [10-12].

When applied right, relational benefits created in supply chain can be the source of competitive advantage within a firm's total supply chain (Jayaram and Tan [13]). For example, larger manufacturing companies, such as Hewlett-Packard and Packard Bell, have re-engineered the linkage of their supply chain by establishing fully owned operations that combine production tasks at the centralized warehouse and freight forwarding site. In this case, logistical service has not only provided place and time utilities but also added additional value to the manufacturing process (Shen and Chou [14]). In 2009, the author toured the Shanghai Port (one of the world largest ports) and observed value-added logistical operations such as final assembly and localization. This type of new offerings creates value-added benefits that contribute to customer's satisfaction. While studying relational benefits in the web environment, Kumar *et al.,* [15] indicated that by enhancing both the utilitarian and hedonistic values experienced by customers, customer satisfaction can be significantly improved, leading to an increase in repeat purchase intentions.

In this study, the concept of relational benefits to the logistical service environment in a business-to-business setting and explore the benefit constructs that best fit the manufacturer–logistics provider relationship will be extended. Since there are no well-established relational benefit measurements for the manufacturer – LSP pair, this study extends the relationship benefits concept

based on the context of operations and supply chain management literature and personal discussions with business managers. The special-treatment benefit construct has been adopted suggested by Gwinner *et al.*, [16], which consists of providing low price and faster delivery. Social benefits were originally referred to as customer's familiarity with the service provider and the emotional part of the relationship.

2. Methodology

2.1 Data Collection

In this study, primary data was gathered since it was not readily available and needed to be customized to suit the study's requirements. Two methods were employed: survey and focus group discussion with experts. A comprehensive list of automotive companies in Malaysia was compiled, revealing approximately 74 registered companies in the Klang Valley. However, some of these companies have ceased operations, either due to relocating to another country or discontinuing their business. Consequently, this study focuses specifically on selected companies that are involved in producing parts for major car brands in Malaysia.

This list was selected from the 'List of Companies Worldwide' website using the filter for 'Automotive Companies in Malaysia', available at: Top 1,469 Automotive Companies in Malaysia - Nov 2022. It was then further refined to include only companies located in the Klang Valley. Two stages of survey were conducted. The first stage involved the team leaders and below, in order to ensure that the questionnaire is relevant enough to all levels of people. In the second stage, the survey targeted respondents with the background and experience pertinent to outsourcing logistics service which are at the Manager level or above. The survey targeted respondents with the background and experience pertinent to outsourcing logistics service. At the same time, appropriate steps were taken to ensure that respondents have appropriate knowledge about logistical services and 3PL at the firm level. To achieve this, the survey was specifically distributed to respondents with relevant expertise and experience in outsourcing logistics services, bypassing the need for open surveys. The survey was distributed using email and WhatsApp, drawing contacts from personal connections and the Yellow Pages. The survey was conducted from August 2022 to February 2023, taking approximately 26 weeks to complete the data collection process, with follow-up emails sent to encourage participation from the selected sample. The questionnaire distribution involved a carefully structured set of questions designed to gather comprehensive insights.

A pilot study was conducted in order to assess the understandability of the survey questions with regards to conceptual framework in Figure 1. This pilot study is very important part of the research process and has been done as a first step before conducting a larger study. The instrument was then pilot-tested in the same small group of academicians and fine-tuned according to respondents' suggestions on concepts, wording, and measurements. A total of ten (10) academicians from different background were selected to be a part of this pilot test in order to assess the clarity and comprehensibility of the survey questions.

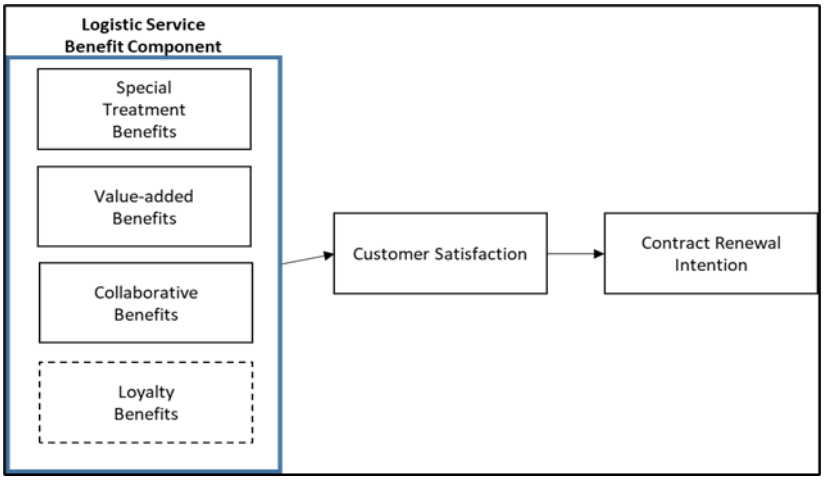

Fig. 1. Conceptual framework

Table 1 shows the summary of respondents' profile by position, sex, age, and working experience in industry to complete the survey. All the respondents were from logistics program either as lecturers or as students. Based on Table 1, most of the respondents (7 out of 10) age more than 40 years old with some who had working experience in the industry. Some of the respondents (6 out of 10) had no working experience and responded based on theoretical knowledge.

Table 1
Descriptive analysis of the pilot test respondents

Respondent	Position	Sex	Age	Working Experience in Industry
R1	Lecturer	Male	>40 years	5 – 10 years
R2	Lecturer	Male	>40 years	Less than 5 years
R3	Lecturer	Female	>40 years	0 year
R4	Lecturer	Female	>40 years	0 year
R5	PHD student	Female	>40 years	0 year
R6	PHD student	Female	30 – 40 years	0 year
R7	PHD student	Male	30 – 40 years	Less than 5 years
R8	Master student	Male	30 – 40 years	Less than 5 years
R9	Master student	Male	<30 years	0 year
R10	Master student	Female	<30 years	0 year

2.2 Understandability Assessment

In order to assess the understandability of the survey questions, Total of 10 people of academician from different background were selected to be a part of this pilot test. Students and academicians with a background in logistics and operations management were selected for this pilot study because their understanding of the terminologies and theories enabled them to effectively conduct the content validity check. The survey question has been distributed to the academicians by online based on the proposed framework in Figure 1. The 10 respondents subjects stratified by position, sex, age, and working experience in industry to complete the survey. Each subject was asked to evaluate one-third (approximately 20) of the total questions. Subjects first answered each symptom question and were then asked (1) whether the question was difficult to understand (yes or no) and, if the question was difficult, (2) what about the question made it difficult to understand and (3) to give suggestions for alternative more understandable wording. On average, 2 questions out of 20 were rated as difficult to understand, and neither older age nor zero years of working experience

were associated with the number of questions rated difficult to understand. Four questions were rated difficult by 10% or more subjects, and these were revised to enhance their simplicity and clarity based on the suggestions of the subjects. The Cronbach alpha value was run at 0.78 which is which indicates the reliability of the questions. Therefore, it is concluded that all questions are understandable to >90% of academicians, and that understandability is not influenced by position or working experience in industry.

In the context of the conceptual model, which involves relational benefits perceived by valid automotive manufacturers and relationship outcomes like satisfaction and contract renewal intention, a Cronbach's Alpha of 0.78 provides useful insights about the reliability of the measures used for these variables. In summary, all model's variables (relational benefits, satisfaction, and contract renewal intention) are measured in a consistent and reliable manner according to the 0.78 Cronbach's Alpha, which supports the validity of the conceptual associations between these variables in the model.

2.3 Structural Equation Modelling (SEM)

SEM is used to assess automotive manufacturers perception of the relational benefit of logistics services and to evaluate the impact of the relational benefit of logistics services measure such as customer satisfaction, and contact renewal intention. All SEM analyses will be conducted using EQS as in Hu and Bentler [17]. As recommended by Hu and Bentler [17], multiple fit criteria will be considered in order to rule out measurement biases. The fit indices considered are those commonly recommended for this type of analysis. The goodness of fit indices for the specified model are shown in Table 2. The chi-square value for the covariance structural model is 113 (df=70). The ratio of chi-square to degrees of freedom (df) is less than 2 and is acceptable. The comparative fit index (CFI) is 0.95, non-normed fit index (NFI) is 0.94 and goodness of fit index (GFI) is 0.92. All measurements exceed generally accepted minimum norms for satisfactory fit of 0.90.

Table 2
Fit statistics for structural model

Model goodness of fit statistics	Acceptable value
Chi-Square to Degrees of Freedom (χ^2/df)	≤ 2.0
RMSEA estimate	≤ 0.06
Comparative Fit Index (CFI)	≤ 0.95
Goodness of Fit Index (GFI)	≤ 0.95
Adjusted goodness-of-fit index AGFI	≤ 0.95
Non-normed fit index (NNFI)	≤ 0.95

Structural equation modelling (SEM) was applied to analyze the hypothesized associations among various constructs using SMART PLS 4. Many similar studies used SEM as the most appropriate methods in assessing the proposed relations as in Refs. [18,19]. Three (3) major components of logistics service benefits: special treatment benefits, value-added benefits, collaborative benefits and satisfaction were associated as the first model, Model 1. Model 2 is the proposed model with the loyalty benefits being added to the model. The model consists of four (4) major components: special treatment benefits, value-added benefits, collaborative benefits and loyalty benefits and their relation to satisfaction. Model 3 depicts the final structural equation model that included all paths of the four major components: special treatment benefits, value-added benefits, collaborative benefits, loyalty benefits towards satisfaction and proceeding to contract renewal intention.

3. Results

3.1 Descriptive Statistics

Data was collected using questionnaire adapted from Li [20], consisting of the questions on the relevant dimension as shown in Table 3. Table 3 also summarises the values of Skewness and Kurtosis for each subfactors. The skewness values range from -1.8 to 1.4, while the values of the kurtosis range from minimum of -1.2 to 3.5. The values show moderate skewness (−1.8-1.8−1.8 to 1.41.41.4) and moderate kurtosis (−1.2-1.2−1.2 to 3.53.53.5) which are within acceptable limits for an analysis using SEM (Hatem *et al.,* [21]).

Table 3
Descriptive statistics of variables

Factor	Symbol	Survey Question	Mean	Std Deviation	Skewness (with std error 0.4)	Kurtosis (with std error 0.7)
Special Treatment Benefits	SPEC 1	Our company often gets competitive prices and shipping rates from the LSP	4.9	1.8	-1.1	1.2
	SPEC 2	LSP is reliable in delivery lead time and good at reducing in delivery lead time	5.3	1.3	-0.3	-0.5
	SPEC 3	LSP provides LTL service to reduce logistic cost and increase security	5.5	1.2	0.1	-1.4
		Composite Mean	**5.2**			
Value-added Benefits	**VAL 1**	LSP provides information about product safety rules and compliance responsibility	**5.7**	1.3	-0.6	-0.4
	VAL2	LSP understands the logistic service needs of our company, and make recommendation according to our preferences	5.5	0.8	0.1	-0.2
	VAL 3	LSP provides pre-sales service such as localization, inspection, door-to-door one-stop service, etc.	**5.7**	1.4	-1.8	3.5
		Composite mean	**5.6**			
Collaborative Benefits	COL 1	LSP is familiar with our business and work with us to achieve our mutual goals	**5.6**	1.4	-1.8	3.5
	COL 2	LSP and our company jointly predicting capacity needs and plan capacity reservation	5.3	1.4	-0.8	0.1
	COL 3	Frequent, on-time, and constructive communication between our company and LSP enable cooperative business arrangements	5.5	1.1	-0.3	-1.3
		Composite Mean	**5.5**			
Loyalty Benefits	LOY 1	LSP provides one-off discount at each 5 years business anniversary	4.8	1.7	-0.2	-1.2
	LOY 2	LSP creates bonding activities once a year	5.0	1.2	-0.1	-1.0
	LOY 3	LSP prioritizes our requests when necessary	5.3	0.9	-0.5	-0.9
		Composite Mean	**5.0**			

Satisfaction	SAT 1	Service provided by most LSPs are what our company wants from them	5.4	1.1	-0.1	-1.1
	SAT 2	Service provided by most LSPs exceed our company's expectation	5.1	1.0	-0.3	0.7
	SAT 3	Most LSPs are at par in technological growth with our organization	4.6	1.3	-0.9	0.4
	SAT 4	Most LSPs understand our company's mission and vision	5.0	1.3	-1.2	1.3
		Composite Mean	**5.0**			
Contract Renewal	NEW 1	More than 80% of LSP firms have been our company's primary logistics service provider over the past several years	5.5	1.4	-1.6	2.4
	NEW 2	More than 80% of LSP firms will continue in business with our company	5.2	1.0	0.1	-0.8
	NEW 3	Our company will renew our contract with 80% of LSP firms based on their performance	5.5	0.8	-0.1	-0.2
	NEW 4	Our company plans to maintain the business relationship with 80% of LSP firms based on the collaborative effort	5.5	0.8	-1.3	0.1
		Composite Mean	**5.4**			

3.1 Model Evaluation

Evaluating the measurement model requires an assessment of both reliability and validity through Confirmatory Factor Analysis (CFA). It is to ensure constructs meet criteria for convergent and discriminant validity. Convergent validity is examined using loading factors and Average Variance Extracted (AVE) values, with a benchmark set at 0.7. Discriminant validity is established through the analysis of cross-loading scores. To determine overall reliability, composite reliability metrics are utilized. The results of the convergent validity assessment are presented in Table 4, demonstrating the consistency of indicators in measuring the intended constructs. While Hair *et al.,* [22] recommended a minimum loading factor of 0.3, consider 0.4 as preferable, and view values above 0.5 as significant, this study adopts a more stringent loading factor threshold of 0.7.

As proposed in the conceptual framework, three main models have been visualised and evaluated in this section. Recall that Model 1 is relating special treatment benefits, value-added benefits, collaborative benefits and satisfaction. Model 2 is the proposed model with the loyalty benefits being added to Model 1. In addition, Model 3 depicts the final structural equation model that included all paths of the four major components: special treatment benefits, value-added benefits, collaborative benefits, loyalty benefits towards satisfaction and proceeding to contract renewal intention.

Table 4 presents metrics with outer loadings exceeding 0.7, confirming the strength of the associations between metrics and factors—an essential aspect in relational benefits towards customer satisfaction. These results validate the reliability and validity of the metrics, thereby enhancing confidence in the research outcomes. Discriminant validity also has been accessed using Average Variance Extracted (AVE), as shown in Table 4.3. Each variable, special treatment benefits, value-added benefits, collaborative benefits, loyalty benefits, satisfaction and contract renewal have an AVE above 0.5, indicating that each variable explains significant variation and remains distinct

from others. This confirms the reliability of the measurements, demonstrating that each aspect is unique and not influenced by errors or overlaps. The data, with all variables showing an AVE above 0.5, supports the satisfactory discriminant validity of our model, further reinforcing the credibility of the study's findings. In addition to convergent and discriminant validity, the outer model can also be evaluated for the reliability of constructs, specifically through the composite reliability of latent variables. A construct is considered reliable if the composite reliability score exceeds 0.7.

Table 4
Convergent Validity

Variable	Indicator	Model 1		Model 2		Model 3		Description
		Outer Loading	AVE (> 0.5)	Outer Loading	AVE (>0.5)	Outer Loading	AVE (>0.5)	
Special Treatment Benefits	SPEC 1	0.936	0.711	0.936	0.711	0.931	0.713	Valid
	SPEC 2	0.808		0.807		0.808		
	SPEC 3	0.778		0.778		0.787		
Value-added Benefits	VAL 1	0.827	0.780	0.827	0.780	0.829	0.779	Valid
	VAL 2	0.921		0.921		0.922		
	VAL 3	0.898		0.898		0.895		
Collaborative Benefits	COL 1	0.840	0.727	0.840	0.727	0.839	0.727	Valid
	COL 2	0.925		0.925		0.927		
	COL 3	0.787		0.788		0.787		
Loyalty Benefits	LOY 1	-	-	0.890	0.793	0.896	0.792	Valid
	LOY 2	-		0.938		0.937		
	LOY 3	-		0.841		0.834		
Satisfaction	SAT 1	0.776	0.754	0.778	0.754	0.812	0.753	Valid
	SAT 2	0.906		0.907		0.928		
	SAT 3	0.935		0.935		0.920		
	SAT 4	0.848		0.846		0.804		
Contract Renewal	NEW 1	-		-		0.936	0.582	Valid
	NEW 2	-		-		0.501		
	NEW 3	-		-		0.578		
	NEW 4	-		-		0.931		

The SmartPLS output provides composite reliability results together with the Cronbach alpha values to measure the internal consistency across the variables, which are illustrated in Table 5. Composite reliability scores above 0.7 and Cronbach's Alpha values nearing 1 indicate robust measurement. For instance, the "Special Treatment Benefits" variable in Model 1 has a composite reliability of 0.880 and a Cronbach's Alpha of 0.807. Likewise, the "Value-added," "Collaborative," and "Satisfaction" variables in Model 1, along with "Value-added," "Collaborative Loyalty," and "Satisfaction" in Model 2, and "Value-added," "Collaborative Loyalty," "Satisfaction," and "Contract Renewal" in Model 3, all exhibit composite reliability scores above 0.8 and Cronbach's Alpha values ranging from 0.807 to 0.890, confirming their reliability.

The next CFA analysis is on the structural model. Post confirming the reliability and validity of the measurement model, the study advances to testing the structural model, examining the interrelationships between latent variables. Figures 2,3 and 4 show the validity and reliability of the final construct model. The analysis incorporates metrics such as R-Square (R^2) and path coefficients to assess the results of the structural model. The study proceeds to assess the inner model by analyzing the R-square value for the reliability of the dependent variable and the t-statistic for the significance of the path coefficients. The R-square, or Coefficient of Determination, measures the impact of the independent variable on the dependent variable. Table 6 presents the R-square results for Model 1, Model 2, and Model 3, respectively, showing the coefficient of determination, which

reflects the proportion of variability in the dependent variable explained by the independent variable.

Table 5
Composite reliability result and Cronbach's Alpha

Variable	Model 1		Model 2		Model 3		Remark
	Composite reliability	Cronbach's Alpha	Composite reliability	Cronbach's Alpha	Composite reliability	Cronbach's Alpha	
Special Treatment Benefits	0.880	0.807	0.880	0.807	0.880	0.807	Reliable
Value-added Benefits	0.914	0.857	0.914	0.857	0.914	0.857	Reliable
Collaborative Benefits	0.888	0.809	0.888	0.809	0.888	0.809	Reliable
Loyalty Benefits	-	-	0.920	0.872	0.919	0.872	Reliable
Satisfaction	0.924	0.890	0.924	0.890	0.924	0.890	Reliable
Contract Renewal	-	-	-		0.839	0.859	Reliable

Table 6
Goodness of fit based on coefficient of determination R^2

Variable	Model 1		Model 2		Model 3	
	R-Square	R-Adjusted	R-Square	R-Adjusted	R-Square	R-Adjusted
Satisfaction	0.533	0.493	0.537	0.483	0.528	0.472
Contract Renewal	-	-	-	-	0.168	0.145

This analysis explores the impact of various factors on the performance of satisfaction and contract renewal. Our findings show that these factors explain range from 52.8% to 53.7% of the variation in satisfaction for all 3 structure models and 16.8% in contract renewal for structure Model 3. These results emphasize the significant influence of the variables studied while recognizing the potential influence of other unexamined factors. However, the R-square's result in contract renewal for Model 3 shows low in value which means the variable has less significance influence explained by the independent variable and at the same time indicates that manufacturer's satisfaction does not necessarily influence contract renewal.

In Model 1, Table 7 shows that the standard path coefficient between special treatment benefits and satisfaction is $\gamma_1 = -0.215$ which negatively affected automotive manufacturers satisfaction. Hypothesis 2, value-added benefits positively affected automotive manufacturers satisfaction is supported by $\gamma_2 = 0.462$. Hypothesis 3, collaborative benefits positively affected automotive manufacturers satisfaction is supported by $\gamma_2 = 0.449$. This model indicates that the factor of value-added benefits has the highest positive impact followed by collaborative benefits.

Table 7
Summary of hypotheses test results for structural Model 1

Hypothesis	Description	Standard path coefficient
H_1	Special treatment benefits - Satisfaction	$\gamma_1 = -0.215$
H_2	Value added benefits - Satisfaction	$\gamma_2 = 0.462$
H_3	Collaborative benefits - Satisfaction	$\gamma_3 = 0.449$

Figure 2 depicts the relation between the variables indicating the strength of path coefficient values for the structural model of Model 1.

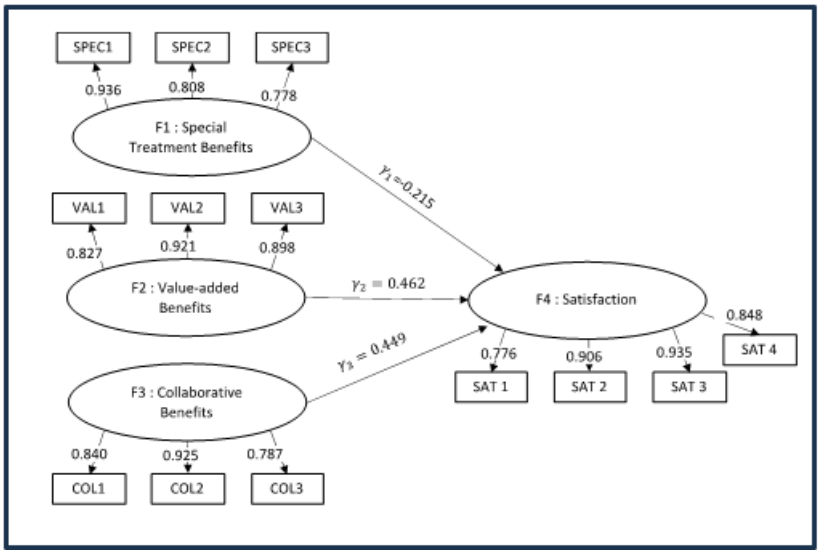

Fig. 2. Covariance of structural Model 1

While loyalty benefits is added, the results of path coefficient are shown in Model 2. Based on Table 8, the path coefficient between special treatment benefits and satisfaction is $\gamma_2 = -0.219$, slightly smaller compared to Model 1 but continues to adversely affect manufacturers' satisfaction. Hypothesis 2, value-added benefits positively affected automotive manufacturers satisfaction is supported by $\gamma_2 = 0.557$, slightly bigger compared to Model 1. Hypothesis 3, collaborative benefits positively affected automotive manufacturers satisfaction is supported by $\gamma_2 = 0.270$, slightly less impact compared to Model 1. Hypothesis 4, loyalty benefits positively affected automotive manufacturers satisfaction with the standard path coefficient value is $\gamma_4 = 0.126$. This model indicates that value-added benefits have the most significant positive impact, followed by collaborative benefits, while also showing that loyalty benefits significantly influence manufacturer satisfaction. These findings remain consistent with Model 1, even when the factor of loyalty benefits is factored in.

Table 8
Summary of hypotheses test results for structural Model 2

Hypothesis	Description	Standard path coefficient
H_1	Special treatment benefits - Satisfaction	$\gamma_1 = -0.219$
H_2	Value added benefits - Satisfaction	$\gamma_2 = 0.557$
H_3	Collaborative benefits - Satisfaction	$\gamma_3 = 0.270$
H_4	Loyalty benefits - Satisfaction	$\gamma_4 = 0.126$

Figure 3 visualises path coefficients for Model 2 with the inclusion of the new factor, Loyalty benefits.

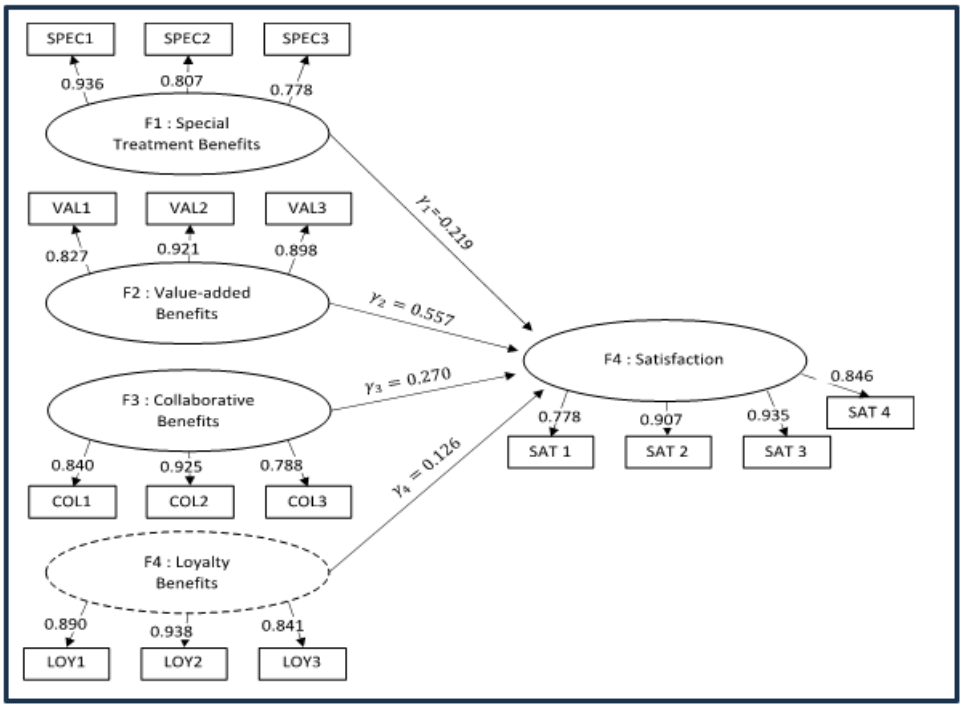

Fig. 3. Covariance of structural Model 1

In Model 3, hypothesis 5 tested the relationship between satisfaction and contract renewal intention which define whether manufacturers satisfaction led to contract renewal intention or vice versa and the results are calculated in Table 9. Based on Table 9, the standard coefficient between satisfaction and contract renewal intention is $\beta_1 = 0.409$. The results indicate that customer (manufacturers) satisfaction among manufacturers has a positive impact on their intention to renew contracts, highlighting that manufacturers' satisfaction drives their intention to renew contracts. Additionally, the results indicate that with the inclusion of the new variable, loyalty benefits, the impact of value-added benefits on manufacturer satisfaction increases and special treatment benefits have no impact on manufacturer's satisfaction. This inconsistency could be attributed to external factors such as survey location, industry type, and other variables.

Table 9
Summary of hypotheses test results for structural Model 3

Hypothesis	Description	Standard path coefficient
H1	Special treatment benefits - Satisfaction	$\gamma_1 = -0.240$
H2	Value added benefits - Satisfaction	$\gamma_2 = 0.653$
H3	Collaborative benefits - Satisfaction	$\gamma_3 = 0.151$
H4	Loyalty benefits - Satisfaction	$\gamma_4 = 0.167$
H5	Satisfaction – Contract renewal intention	$\beta_1 = 0.409$

Figure 4 summarises the relationship between satisfaction and contract renewal intention and visualised the potential of whether manufacturers satisfaction led to contract renewal intention.

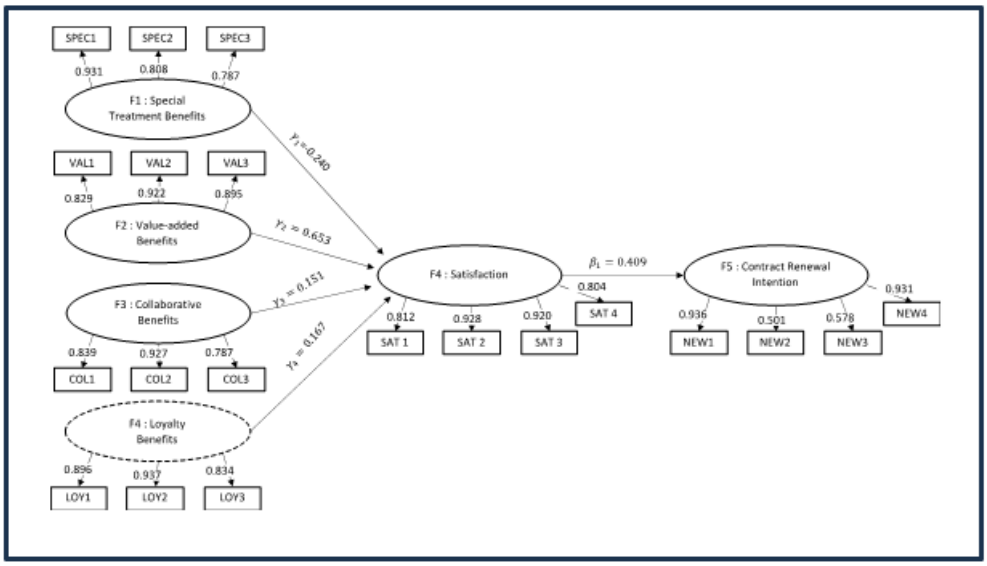

Fig. 4. Covariance of structural Model 3

In summary of data analysis using SEM, this study shows that automotive manufacturers perceived value-added benefits, collaborative benefits and loyalty benefits lead to higher level of satisfaction and special treatment benefits has given no impact on the manufacturer's satisfaction. The coefficient values generated based on the SEM model shows that value-added has the highest positive impact of 0.653, followed by Loyalty Benefits at 0.167, while also showing that loyalty benefits significantly influence manufacturer satisfaction. Special Treatment, on the other hand, has a negative impact of -0.240, indicating that it does not contribute to manufacturer satisfaction. This finding contradicts the results reported by Li [23].

4. Conclusions and Discussion

As a conclusion, Logistics Service Providers (LSPs) are becoming more competitive as the global market expands and opens. This results in more challenges in the automotive business as LSPs need to ensure that they remain significant as part of the players in the industry. Hence, preserving the relations among the partners is crucial. Through the literature review, identifying the factors considered as relational benefits of logistics services perceived by Malaysian manufacturers in the automotive industry—was achieved by gaining an understanding of the broader context of significant relational benefits. This includes three possible scales (special treatment benefits, collaborative benefits, and value-added benefits) that represent the characteristics of relational benefits, based on findings from US companies (Li, [23]). Based on the survey results, Special Treatment Benefits received a score of 5.2, reflecting a 74.7 percent level of agreement, indicating that it will play a significant role. On the other hand, value Added Benefits scored the highest at 5.6 or 80 percent level of agreement in which all elements specified the need to ensure that the relationship will bring value to the partners. As the automotive business, especially in car part manufacturing, depends on the car market, every LSP is working towards the minor cost operation as agreed highly by the respondents in every dimension of Value-Added Benefits proposed in the study.

Collaborative benefits scored high at 5.5, which means that the respondents agree that jointly planning for future capacity needs will help achieve mutual goals. However, Collaborative Benefits are highly dependent on the other dimension, the newly added dimension, Loyalty benefits. That can indicate that having collaborative efforts could generate loyalty among the logistics service providers. Loyalty Benefits are added to the framework with new dimensions of loyalty creation through

bonding activities. Working together to achieve mutual goals is assumed to build long-lasting relationships and ends with contract renewal. Hence, more details analysis of the effect of loyalty benefits on contract renewal is needed. From this study, adding Loyalty Benefits into the framework will enable the LSPs in automotive companies to plan to build their relations.

The preservation of successful relationships among logistics partners in the automotive business remains to be perceived as necessary by those within the field. Therefore, on top of Special Treatment, Value Added, and Collaborative Benefits among the logistics providers, Loyalty Benefits can be significant. This study shows that Loyalty Benefit is perceived to be impacting Customer Satisfaction; however, combined with other factors, the impact is no longer significant. This result can be due to the high dependency on the collaborative benefits earned by the companies. Therefore, the impact of each factor on satisfaction is also crucial to be researched and concluded to be part of the mode.

Several limitations should be acknowledged for future research. Firstly, this study relies on a seven-point Likert scale survey. Future research could utilize case studies to delve into the intricacies of supply chain relationships. Secondly, this study is solely based on data collected from manufacturers in Klang Valley area. Future studies could consider examining both manufacturers and logistics service providers in whole Malaysia simultaneously to understand benefits and rewards from both perspectives. Finally, it is recommended that future studies could conduct model re-specification by analysed through difference perception between levels and difference perception between companies in term of size, volume and number of stakeholders involved. Moreover, collaboration among supply chain partners should be further explored from both the manufacturer's and the third-party logistics provider's perspectives.

It is also recommended that future research can focus on technological integration and relational benefits among logistics service providers (LSPs) in which the research focus can be on how the adoption of digital technologies (e.g., cloud platforms, IoT, blockchain, AI) influences collaborative relationships among LSPs in Klang Valley. Several areas such as Digital Platforms and Connectivity, Data Sharing and Analytics, Internet of Things (IoT) and Automation and Artificial Intelligence (AI) and Predictive Insights can also be further explored. The integration of technology can increase the Potential Benefits to Relational Dynamics among LSPs and automotive manufacturers due to the ability of technology to enable seamless communication and reduce misunderstandings and delays. In addition to that it will improve trust and transparency as successful tech integration can deepen partnerships by demonstrating long-term commitment to innovation. In this study survey and interview were used, however it is recommended that case studies can also be explored and use models such as the technology-organization-environment (TOE) framework or relational exchange theory to assess relational benefits.

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