

# Study on Measuring and Analysing the Quality of Road Freight Transport Service

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## Abstract

*The study aims to measure and analyse the quality of road haulage services in order to identify and implement best practices for quality improvement. The assessment of the quality of road haulage services was carried out from the external perspective of the customer with a focus on the dimensions of quality, based on their perceptions of the satisfaction of the requirements and conditions demanded by the 43 customers, represented by companies from the food industry, light industry and wholesale trade. As research methods, a survey based on a structured questionnaire was used, which included 51 items/primary variables that formed the basis for the construction of the 5 aggregate variables, which express both the quality of the road haulage service provided to the approached as a process and the human resource practices that contributed to quality assurance.*

**Key words:** road freight management, quality of service, quality dimensions, quality management

**J.E.L. classification:** M10, M19.

## 1. Introduction

As customer demands increase, competition in the market becomes stronger and stronger, and ways of measuring how customers perceive the quality of road transport services influence customer behaviour and their decision to purchase the service, which many managers see as a major strategic issue. A strategic view of the quality provided to customers, coupled with a positive customer experience ensures competitive advantage in an increasingly dynamic and sometimes turbulent market with sudden changes that are increasingly difficult to anticipate. For this reason firms are increasingly concerned to identify and minimise market risks, and to capitalise as effectively as possible on opportunities and respond appropriately and quickly to market changes, among which changing customer requirements and behaviour are critical success factors. (Goodman, 2009).

Road haulage companies, in order to secure a competitive advantage in the market, need to address quality issues from the customer's perspective. According to many authors the quality approach must take into account their ability to provide high quality services and focus on customer service evaluation, process and human interactions (Parasuraman *et al*, 1988; Grönroos, 2007). Also customer behavioural intentions are convincing evidence that customers are influenced by service quality (Zeithaml *et al*, 1996).

Service companies are beginning to understand that quality improvement cannot be achieved unless it is measured. (Reichheld & Sasser, 1990, p. 105). Nowadays more and more researchers are of the opinion that business strategies focused on improving the quality provided to customers, with the greatest applicability, such as quality management, customer experience management and customer relationship management, emphasize the evaluation of customer behaviors regarding their experience with the service provider, which has required the development and use of customer

feedback programs (Asher, 1996).

## 2. Literature review

Quality expresses "the degree of predictability, availability and uniformity of products/services at the lowest cost and which meet the requirements of the customers, i.e. the market" (Ilies & Crisan, 2011, p. 34). J. Juran (1999) approaches quality from the customer's perspective, considering that we can only speak of the quality of a product/service to the extent that it meets the needs of consumption/use in terms of conformity to specifications, scope of use and market requirements. At the same time Oakland (2003) argued that the most important feature of quality is the assurance that the product/service offered to the customer satisfies the need for which it was purchased. This means that the author makes the link between producer-based and user-based quality (operational approach to quality). Companies in general, including road haulage companies, need to understand that "quality improvement cannot be achieved unless it is measured" (Reichheld & Sasser, 1990, p. 105).

Based on the principles of the SERVQUAL model of Parasuraman *et al* (1985; 1988), in order to measure and analyse the quality of road haulage services provided by the TR transport company, a scale with four dimensions of quality was used in the study, taking into account the particularities of this sector of activity and the services provided, namely: *Reliability: Responsiveness/Responsiveness: Assurance/Competence Tangibility*.

Despite the progress in the approach to quality brought about by the emergence and development of quality measurement and analysis models based on quality management and customer relationship management, a number of authors in studies concerning the road haulage sector successfully use both subjective criteria largely reflecting customer perceptions and attitudes and more concrete objective criteria based on precise standards negotiated with customers (Rushton *et al*, 2014).

This creates difficulties in measuring the quality of road haulage services, as firms with more complete information about customer perceptions of service quality can make better decisions to serve customers according to their expectations and requirements (Sighiartău, 2022). Since service quality is "intangible and non-standardised", measuring service quality, according to many authors, has a high degree of subjectivity and is largely defined by customers (Hartline and Ferrell, 1996). The requirements for a service quality measurement process in the road haulage sector require knowledge of the key factors that determine quality from the customers' perspective by taking into account the particularities and complexity of these services. At the same time, achieving and delivering a quality service to the customer requires direct and effective interaction with the customer, taking into account the firm's ability to serve the customer according to their expectations and needs and the effectiveness of the interaction with the customer (Cook, 2008, p. 5).

Perceived service quality refers to the ability to continuously and accurately deliver the service to the standards promised to customers as they have been assured it will be delivered. It encompasses credibility, reliability, the ability to perform the service exactly to the promised standards as well as the ability to deliver the service to the promised quality standards the first time and every time without failure (Ross, 1994). Customer feedback is becoming an increasingly important factor in actions to improve the quality of road haulage services (Grönroos, 2007). Improving the quality of service provided and the relationship with customers is considered key to improving business performance (Asher, 1996).

## 3. Research methodology

The study undertaken aims to develop an appropriate and effective model for measuring and analysing the quality of road freight transport services focusing on the relevant dimensions of service quality, in which the quality delivery process and human interactions play an important role, based on a scientific rationale and underpinned by management strategies, policies and practices.

For this purpose, the road transport company "TR" was chosen as supplier, relevant in the field for the activity carried out and the results obtained, which has 113 vehicles with a capacity of more than 3.5 tons and 186 well-trained employees. The aim is to identify and implement best practices to improve the quality of transport services provided by "TR" as a major source of competitiveness in an increasingly dynamic competitive market. The study undertaken, from the external customer

perspective, was based on a survey administered to the main customers of the road transport company "TR", made up of "client companies" from the food industry (51.17%), light industry (16.28%), to which were added wholesale distributors (32.55%). The respondents to the questionnaire are persons with managerial responsibilities for customer relations and customer service delivery. In order to measure the quality of the road haulage service based on respondents' perceptions, a questionnaire was used as a research tool, which expresses both the degree to which the road haulage service meets the specifications imposed by the customer regarding the level of service provided and the degree to which it meets the customer's requirements. The Likert scale measuring agreement was used for the evaluation, with values ranging from 1 (total disagreement or very dissatisfied) to 5 (total agreement or very satisfied).

Given the aim and objective of the research, 5 relevant aggregate variables were defined, which formed the basis of the construct consisting of 51 items/primary variables. The 5 aggregate variables of the analysis model, which express the dimension of the quality of the service provided, are the following: *Quality of the transport service provided (Clt.pr)*; *Reliability (Fbl)*; *Responsiveness (Rcp)*; *Competence (Cmpt)*; *Tangibility (Tg)*. Table 1 presents the results of the reliability analysis based on the determination of internal consistency, using *Cronbach's Alpha* coefficient as a tool calculated with the statistical software STATA 16.

Table no. 1 Reliability analysis test scale

Variable	Sign	Number of items in the scale	Cronbach's Alpha	Average interitem covariance
<i>Fbl</i>	+	8	0.8462	.1124917
<i>Rcp</i>	+	9	0.8137	.0918431
<i>Cmpt</i>	+	7	0.8681	.1033514
<i>Tg</i>	+	6	0.8603	.1771825
<i>Clt_pr</i>	+	21	0.9135	.1967782

Source: Authors' contribution

As can be seen in Table 1, the variables used in the analysis model applied in this study, record values between 0.8137 and 0.9135, which means that all aggregate variables have acceptable internal consistency and are relevant for the analysis performed.

## 4. Findings

### 4.1. Analysis of variables expressing the quality of road haulage services at "TR" company

The analysis of the quality of service provided by the company "TR", adopted in this study, in order to measure the quality of road haulage services provided by the company "TR", is based on the quality of service related to the whole process of its provision to the customer, represented by the variable *Clt\_pr* which is defined by the respondents' (customers') perceptions determined by the relevant characteristics of the whole process of ensuring and providing the road haulage service as well as by the 4 dimensions of quality represented by the variables *Ftb*, *Rcp* and *Cpt*, *Tg*.

Based on the descriptive statistics indicators (mean, sd, cv, se(mean)), calculated on the basis of the questionnaire administered to the 43 clients who are part of the research sample, in order to determine the construct validity of the 5 aggregate variables, we can find the following:

1. The quality of the road haulage service, represented by the variable *Clt\_pr*, and the four dimensions represented by the variables *Ftb*, *Rcp* and *Cpt*, *Tg* have a relevant structure in relation to the primary variables that compose them, for a sample of 43 statistical units. Based on the data in Table 2, we see that the average score recorded by the aggregate variable *Clt\_pr* is 3.8641. If we refer to the variables representing the quality dimensions that make up the variable *Clt\_pr*, we find that the best average scores, in the opinion of the respondents to the questionnaire, are recorded by the reliability represented by the variable *Fbl* (3.9021) and the responsiveness represented by the variable *Rcp* (3.9025). These are followed by competence represented by the *Cmpt* variable with an

average score of 3.8517 and the *Tg* variable which records the lowest score, due to the fact that the tangibility of the road haulage service is more difficult to define, it can only be assessed according to the transport conditions, the type of goods with their defining characteristics and the equipment and facilities at the loading, unloading and storage points.

Table no. 2. *Cl<sub>t</sub> pr*, *Fbl*, *Cmpt*, *Rcp*, *Tg*, statistics ( count mean sd cv semean )

Variable	N	mean	sd	cv	if(mean)
<i>Fbl</i>	43	3.9021	.4063	.0933	.0341
<i>Rcp</i>	43	3.9025	.4133	.0616	.0391
<i>Cmpt</i>	43	3.8517	.5271	.0974	.0428
<i>Tg</i>	43	3.6803	.3971	.0853	.0324
<i>Cl<sub>t</sub> pr</i>	43	3.8641	.5752	.0818	.0512

Source: Authors' contribution

2. The mean scores of the 5 variables are dispersed on average around the observed scores, with acceptable values between 0.3971 and 0.5390 representing the standard deviation (*sd*).

3. The standard error is between 0.0342 and 0.0512, which means that the observed mean value, with a 95% probability, will be in the range: 3.7617 - 3.9665 for the variable *Cl<sub>t</sub> pr*; 3.8419 - 3.9703 for the variable *Fbl*; 3.7822 - 3.9373 for the variable *Cmpt*; 3.8243 - 3.9807 for the variable *Rcp*; 3.6155 - 3.7451 for the variable *Tg*;

4. The size of the coefficients of variation (*cv*), is between 0.0616 and 0.0974, which means that the statistical population has an acceptable degree of homogeneity.

#### 4.1.1. Analysis of the quality represented by the variable "*Cl<sub>t</sub> pr*"

The quality of transport services provided by the road haulage company "TR", represented by the aggregate variable *Cl<sub>t</sub> pr*, is composed of the sum of the 21 primary variables included in the questionnaire administered to 43 customers, and expressing the respondents' perception of the quality provided throughout the process and human interactions.

From the analysis of the descriptive statistics indicators of the primary variables, which make up the aggregate variable *Cl<sub>t</sub> pr*, the highest scores, above average, refer to: Responsiveness to customer request for renegotiation of tariffs and transport conditions with customers; timeliness of responses in receiving and resolving complaints through effective and appropriate actions; ensuring a fair relationship between quality of services and transport tariff/price; providing adequate and timely information to customers on monitoring and providing transport service; employees of the transport company have adequate knowledge and skills to respond to customer requirements; completing transport documents with high clarity; ensuring an optimal transport route according to customer requirements and economy of the transport process, etc;

Lower scores, compared to the average score, according to the perception of the respondents to the questionnaire, are recorded for the variables referring to: the frequency with which customer satisfaction is assessed at well-defined intervals; responding promptly to customer requests for assistance (packing, loading, unloading, preparation of transport documents; application of incentive discount policies); informing the customer promptly in the event of transport delays; providing a website to communicate effectively with customers; developing employees on the basis of appropriate and effective training programmes: ability to honour orders on an emergency basis.

#### 4.1.2. Analysis of the quality dimensions of road haulage service

Given that improving the quality of road haulage service is a major factor in improving the competitiveness of transport firms, quality provision is vital to their survival in an increasingly competitive and uncertain market and is considered a critical success factor. Thus in this study we set out to carry out a more extensive analysis that takes into account the dimensions of quality. The model used in this study is based on the principles of the SERVQUAL model of Parasuraman et al.

(1985, 1988, 1996), as well as the criteria of the EFQM Excellence Awards, which are expressed in four dimensions relevant to road freight transport quality: reliability; competence; responsiveness; tangibility. In the following we will analyze the quality of transport services provided to the 43 clients of the transport company "TR", represented by the four dimensions represented by the variables *Ftb*, *Rcp* and *Cpt*, *Tg*.

#### **4.1.2.1. Analysis of "Reliability" represented by the variable "Fbl"**

Reliability as a dimension of the quality of road haulage services, represented by the variable *Fbl*, composed of 8 primary variables, refers to the commitment made by the road haulage company to honour orders, i.e. to perform the contracted service, in accordance with the standards negotiated and included in the offer.

From the analysis of the average scores obtained from the processing of the questionnaire we can see that the primary variables with the highest scores, above the average score of the aggregate variable, represent in the opinion of the respondents the key factors for ensuring the reliability of the road haulage service provided to customers by the transport company. These relate to: the ability to provide the service to the standards promised in the offer; meeting promises of on-time delivery and honouring urgent orders; ensuring flexibility when changes are desired in the scheduling and execution of orders; ensuring an adequate schedule for performing services according to the conditions imposed by the customer.

Lower scores, below average but within the acceptable range, include variables relating to: providing sufficient and timely information to monitor the status of customer orders; taking responsibility for ensuring the integrity of the goods being transported; ability to provide the promised service to customers on time and accurately based on the standards contained in the offer; ensuring a sufficient number of trips on the route/itinerary agreed with the customer.

#### **4.1.2.2. Analysis of "Competence" represented by the variable "Cmpt"**

According to Parasuraman et al. (1985) "competence" as a service dimension expresses the ability of the firm's employees to have the knowledge and skills needed to deliver quality, as well as their attitude and behaviour which should convey confidence and trust to customers. It is represented by the aggregate variable *Cmpt*, composed of 7 variables, has a good internal consistency (Table 1), and records a mean score of 3.8517.

From the analysis of the structure of the aggregate variable *Cmpt*, it appears that the following primary variables/items have the highest average scores: skills and experience required to provide a quality service; professional training of employees and their involvement in solving customer problems; trust conveyed to customers by transport company employees through their attitude and behaviour; professional training and involvement in solving customer problems

Lower scores, below the mean of the aggregate variable *Cmpt*, sum up the primary variables that relate to: effectiveness of employee communication with customers; providing adequate and effective training programs for employee development; providing employees with the necessary skills and interest in building good customer relations.

#### **4.1.2.3. Analysis of "Responsiveness" represented by the variable "CPR"**

Responsiveness, represented by the variable *Rcp* as a dimension of the road haulage service, expresses the ability of the haulage firm's employees to respond promptly to all customer requests in order to improve the relationship with the customer by providing quality according to the needs and conditions required by the customer. As an aggregate variable *Rcp* has 9 primary variables in its structure, with good internal consistency (taebl 1), with mean scores determined based on the perception of customers who are part of the research sample.

From the analysis of the structure of the aggregate variable *Rcp* we can see that the primary variables that compose it in the perception of the respondents to the questionnaire, which record the best scores above the average of the aggregate variable, refer to: employees understand the customer's needs and expectations, show promptness and help to satisfy them; employees of the transport company show availability and politeness in responding to customers' requests; promptly inform customers about the status of orders and the extent to which standards are met regarding the execution of the order; employees of the transport company understand the customer's specific needs and help

to satisfy them; employees of the transport company offer solutions when customers contact the department dealing with "customer service" to file a complaint and facilitate its resolution in a short time.

Lower, below-average scores given by respondents to the primary variables that make up the aggregate variable *Rcp*, refer to employees' attitudes and behaviour regarding: Promptness and professionalism with which they act to resolve special customer requests; promptly compensating customers for loss or damage of goods caused by the fault of the transport company; readiness and helpfulness of employees when customers request changes in the transport schedule; employees of the transport company show kindness and helpfulness in meeting the standards contained in the quotation for meeting delivery deadlines.

#### 4.1.2.4. Analysis of "Tangibility" represented by the variable "Tg"

Tangibility, as a dimension of the quality of road transport service, represented by the aggregate variable *Tg*, composed of 6 primary variables, includes a series of elements relating to: the performance and external appearance of the means of transport; the equipment on board and at the loading/unloading and transshipment points; the image and behaviour of the transport company's employees and drivers; the state of the infrastructure, etc.

Starting from the structure of the aggregate variable *Tg* with the primary variables that compose it, we can see that the highest scores, above the average of the aggregate variable, are recorded by the primary variables that refer to: the provision of transport vehicles with technical characteristics and equipment that meet European standards; the employees working for the transport company have a neat appearance; the equipment of the means of transport ensure the safety of the cargo during the transport process and handling operations at the loading-unloading points; the provision of transport capacities requested by customers.

The primary variables in the structure of the aggregate variable *Tg*, assessed on the basis of the perception of the respondents to the questionnaire, which score lower than the average of the aggregate variable refer to the following: providing customers with sufficient transport capacity; the transport company has adequate facilities for monitoring the cargo during the journey and loading/unloading operations.

## 4.2. Analysis of statistical relationships between variables *Fbl*, *Cmpt*, *Rcp*, *Tg*, *Clt\_pr*

The analysis of the statistical relationships between the variables of the model for measuring and analysing the quality of road freight transport services focuses on determining the impact of the dimensions of the quality of road freight transport services provided by the transport company "TR", represented by the independent variables *Fbl*, *Cmt*, *Rcp*, *Tg*, on the dependent variable *Clt\_pr*. For this purpose, an econometric model with a single independent variable was used to carry out the regression analysis, the results of which are presented in Table 3.

Table no. 3. Influence of independent variables, *Fbl*, *Cmpt*, *Rcp*, *Tg* on of the dependent variable *Clt\_pr*

Independent variable	N	Prob > F	R-squared	Reg. Coef.	t	P> t
<i>Fbl</i>	43	0.0000	0.7832	.6276	9.22	0.000
<i>Cmpt</i>	42	0.0000	0.7692	.6635	10.48	0.000
<i>Rcp</i>	41	0.0000	0.8170	.7591	8.57	0.000
<i>Tg</i>	43	0.0000	0.4752	.4159	6.62	0.001

Source: Authors' contribution

According to the data contained in Table 3 it results that the econometric model used to determine the influence of each independent variable, *Fbl*, *Cmpt*, *Rcp*, *Tg* on the dependent variable *Clt\_pr*, is correct, which is demonstrated by the fact that:

- "F" test whose Prob > F = 0.0000 < 0.05;

- the regression coefficient of the variables is positive and between 0.4159 and 0.7591 and is estimated with  $P > |t| = 0.000 < 0.05$ .

All these results show that among the 4 independent variables expressing the dimensions of road haulage service quality (*Fbl*, *Cmt*, *Rcp*, *Tg*) have a significant and positive influence on the dependent variable *Clt\_pr*. The variation of the independent variables *Rcp*, *Fbl*, *Cmt*, ranging from 81.70% to 76.92%, explains in the highest proportion the variation of the dependent variable *Clt\_pr* (R-squared ranges from 0.7692 to 0.8170). The variation of the variable *Tg* explains in the lowest proportion (47.52%) the variation of the dependent variable *Clt\_pr* (R-squared = 0.4752), given that the tangible elements of the road haulage service throughout its duration are more difficult for customers to assess, which influences the measurement of quality based on customers' perception of the quality of the service provided.

## 5. Conclusions

The empirical study was carried out, based on relevant literature and an appropriate methodology for measuring and analysing the quality provided to customers, by a firm representative of the field under study. As it results from the study of the literature and from the application of the proposed model for measuring and analysing the quality of the road haulage service, it can be seen that this type of service is standardised to a small extent, which is why we consider that extensive and in-depth studies are needed to establish standards for the relevant quantitative criteria in ensuring the quality of road haulage services. For this purpose managers should identify quality problems and find the most appropriate solutions for improvement, both in relation to the transport process and human resource practices that have a significant impact on the quality provided by the TR transport company.

Both the measurement of the quality of the road freight service and its dimensions and the regression analysis show that there is a significant relationship between the quality dimensions and the quality of the road freight service measured at the whole process level, which is true for all the variables characterising the quality dimensions. It thus results that the dimensions of quality of the road freight transport service represented by the variables *Fbl*, *Rcp*, *Cmt*, and *Tg*, are good predictors for the improvement of the quality of the service provided by the transport company "TR".

The information and findings provided by the study undertaken highlight the fact that the road haulage company "TR" must intensify its efforts to provide a transport service at high standards of quality delivery according to the needs and expectations of customers by :

- strategic approach to the road haulage service provided to customers and the alignment to quality improvement strategies and policies;
- promoting a culture of excellence in customer service delivery, where quality improvement and customer satisfaction must be core values of the company;
- ensuring permanent contact and effective communication with customers;
- evaluation of customer satisfaction at well-defined intervals;
- constantly updating the company's website to communicate effectively with customers;
- providing effective feedback on the operationalisation of the transport process and quality delivery;
- developing employees' customer relations skills based on appropriate and effective training programmes, primarily for front-line employees (managers, drivers, dispatchers, technical and commercial staff);
- ensuring transport capacity to meet emergency orders;
- implementing effective transport management software to ensure better monitoring of operations for the entire process of providing service to customers (preparation of transport documents, invoice processing, customs clearance, real-time monitoring of orders, etc.), with the effect of improving customer service. At the same time, computerisation improves the efficiency of the road haulage company's business processes by reducing administrative and operating costs and increasing productivity;
- integration into competitive logistics chains that facilitate the planning, execution and optimisation of physical flows and the efficiency of the transport process;

- an appropriate and effective transport management system that encompasses all functions of the organisation to help ensure operational efficiency, optimise costs and improve customer satisfaction.

As the quality of transport service associated with customer experience is a major strategic objective for both managers and other employees who must demonstrate commitment to achieving performance through quality in the short, medium and long term, we believe that to ensure quality improvement to meet customer needs and demands, the management of the road haulage company must have an up-to-date customer relationship database, which ensures that all employees of the haulage company are aware of the need to focus their quality improvement efforts on customer issues taking into account their experience with the “TR” haulage company. This should include:

- the customer's experiences with the transport company related to the provision of the road haulage service, associated with the characteristics and type of services offered, such as the service provider's customised offers for special requests;
- costs expressing the expenditure on the entire transport process, i.e. the total cost of transport, which includes, in addition to the actual transport costs (travel), the costs of storage, handling and packaging of goods for transport;
- ensuring the transport and integrity of goods.

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