



# **AVALIAÇÃO DA SATISFAÇÃO DE CLIENTES DE TERMINAIS INTERMODAIS DE GRÃOS: EVIDÊNCIAS EMPÍRICAS DE BRASIL**

**Lechan Colares-Santos<sup>1</sup>**  
**Dario de Oliveira Lima-Filho<sup>2</sup>**  
**Alexandre Borges-Santos<sup>3</sup>**  
**Renato Luiz Sproesser<sup>4</sup>**  
**Filipe Quevedo-Silva<sup>5</sup>**

## **Resumo**

Terminal intermodal desempenha um papel importante no transporte de cargas, uma vez que o seu desempenho operacional impacta em todo o sistema, especialmente nas cadeias de *commodities*. Embora alguns estudos tenham sido realizados em todo o mundo explorando as capacidades operacionais dos terminais intermodais, poucos abordaram a satisfação do cliente. A fim de ampliar o conhecimento sobre esta questão, investigou-se o desempenho de terminais intermodais de grãos sobre a ótica da eficácia, por meio da satisfação do cliente. Para alcançar o objetivo, foi realizada uma pesquisa com 54

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<sup>1</sup> Doutorando em Administração pela Universidade Estadual de Maringá. Professor da Universidade do Oeste Paulista (UNOESTE), Presidente Prudente, SP, Brasil. E-mail: lechan@unoeste.br

<sup>2</sup> Doutor em Administração pela Fundação Getúlio Vargas. Professor da Universidade Federal de Mato Grosso do Sul, Campo Grande, MS, Brasil. E-mail: dariolimafilho@gmail.com

<sup>3</sup> Doutorando em Engenharia de Produção pela Universidade Federal de São Carlos (UFSCar), São Carlos, SP, Brasil. E-mail: borges.alexandre@hotmail.com

<sup>4</sup> Doutor em Génie de Systèmes Industriels - Institut National Polytechnique de Lorraine-França. Professor da Universidade Federal de Mato Grosso do Sul, Campo Grande, MS, Brasil. E-mail: renato.sproesser@ufms.br

<sup>5</sup> Doutor em Administração pela Universidade Nove de Julho. Professor da Universidade Nove de Julho, São Paulo, SP, Brasil. E-mail: admquevedo@hotmail.com

empresas/clientes das cinco regiões brasileiras. A análise foi realizada por meio da técnica de abordagem multiplicativa e do modelo de Importância-Desempenho. Os resultados mostram que os terminais não estão alcançando plena eficácia, apontando as dimensões produto e preço como pontos fracos, e, portanto, devem ser considerada a reformulação de estratégias, já a dimensão praça foi avaliada como ponto forte. Portanto, os operadores de terminais parecem adotar uma estratégia de produto, orientada a serviços, em vez de uma estratégia orientada para o mercado. A principal limitação deste estudo está relacionada com o tamanho da amostra, o que, por sua vez, impede generalizar os resultados para o objeto, portanto, devem ser cuidadosamente analisados. Embora o estudo não possa ser visto como conclusivo, traz insights interessantes para o setores público e privado. Sugere-se, todavia, a investigação a ser conduzida com uma amostra maior ou até mesmo em lugares diferentes para testar as evidências encontradas neste estudo, a fim de consolidar a teoria.

**Palavras-chave:** Agronegócios; Logística; *Marketing*; Desempenho Organizacional; Transporte

## **ASSESSING CUSTOMER SATISFACTION OF GRAIN INTERMODAL TERMINALS: EMPIRICAL EVIDENCE FROM BRAZIL**

### **Abstract**

Intermodal terminal plays an important role in the freight transport, once its operational performance impacts the whole system, especially in commodity chains. Although some studies have been conducted worldwide to explore intermodal terminals operational capacities, few of them have addressed the customer satisfaction. Thus, in order to extend the knowledge on this particular issue, we aim to assess grain intermodal terminals performance by shedding light upon the effectiveness dimension, measured through the customer's satisfaction. To achieve our goal, a survey was conducted with 54 companies/customers spread throughout the five Brazilian regions. The data analysis was performed through Multiplicative Approach technique and Importance-Performance model. Results show that terminals are not reaching full effectiveness, and their marketing dimensions Product and Price are weak, and, therefore, should be

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considered to reformulation. Dimension Place was found to be the strongest force. Therefore, terminals' operators appear to adopt a product/service-oriented strategy, rather than a market-driven strategy. The main constraint of this study is related to the sample size, which, in turn, impedes us to generalize the results to the object, so they must be carefully analyzed and applied. Although our study may not be seen as conclusive, it brings interesting insights for both public and private sectors. We encourage further research to be conducted with a larger sample or even in different places to test the evidence found in this study in order to consolidate the theory.

**Keywords:** Agribusiness; Logistics; Marketing; Organizational Performance; Transportation

## Introduction

Brazil is considered one of the major players in the global agribusiness. The country is the second largest producer of soybean, and third in corn, but leads the world's ranking on the amount of grain exported. In the 2013/14, around 193 million tons of grains were produced in 57.06 million hectares. For 2014/2015, it is supposed to be harvested 206.34 million tons from the 57.52 million hectares cultivated, representing an increase of 6.6%, and 0.8% over the previous harvest, respectively (CONAB, 2015). In 2014, Brazil's agribusiness exports yielded US\$ 96.748 million (MAPA, 2014). The continuous growth on exports of Brazilian agricultural commodities has contributed massively for the generation of positive results for the country's trade balance.

Despite having a significant competitive advantage on production costs as well as comparative advantages, such as favorable climate and land availability, over its competitors, the country loses competitiveness on its own poor and costly logistic system. The scarcity of warehouses and adequate transportation system force rural producers, and companies to operate contrary to what is consensus on literature: use truck as the main mean of transport of low value-added goods for long-haul. In addition of being considered an expensive mean, mostly of Brazilian roads are in precarious conditions. According to National Confederation of Transport (CNT), 63.8% of federal and state-owned highways are classified as bad, regular or very bad (CNT, 2013). This situation directly affects the quality, safety, and price of freight transport.

In order to reduce qualitative and quantitative losses in the system, studies about intermodal freight transport have received much attention if compared to studies specifically related to the intermodal terminal, or transfer point. DeMaria (2004) points out to the importance of intermodal terminal on the balance of logistic systems. The author suggests that efficiency and profitability at a national level will depend on terminal's location, scale, as well as organizational and structural components. In other words, the competitiveness of the companies is closely linked to the performance of intermodal terminals. Maas (2001) reinforces this idea by saying that intermodal terminals, including seaports, can contribute to increasing efficiency and save costs in operation of the transport system in which they are inserted and, consequently, of the logistic system as a whole.

Since intermodal terminals play an important role in the logistics of agribusiness, the Brazilian Government has recognized the

current deficiencies in the system and is taking action to solve them through research and investment policies. It is worth noting that this manuscript resulted from the project which aimed at measuring Brazilian intermodal terminals' performance funded by Brazilian Council for Scientific and Technological Development (CNPq). Here, our intention is to focus on the customer satisfaction, a marketing dimension that must be better developed in studies of logistics performance measurement (Bourlarkis and Melewar (2011). Therefore, this work seeks at contributing at two levels: a) theoretical: extending the current literature by assessing customer satisfaction in intermodal terminals; b) managerial: providing insights to public and private agents in order to improve service quality.

This paper is structured as follows. In the next section, we present the main concepts required to provide theoretical support for the analysis. In the sequence, material and method procedures are described accordingly. Finally, results and conclusions are presented, followed by some practical implications.

## **Theoretical Reference**

### **Service concepts**

The more an economy grows, the more important service sector becomes (Fitzsimmons, Fitzsimmons, 2003). With the development of the economy, there is an increase in the purchasing power of the population, allowing the transference of daily activities to third party service providers (Las Casas, 2008). This phenomenon, according to Lovelock and Wright (2002), produces big changes in the dynamics of the economy, increasing the number of jobs in the service sector. In other words, as a national economy develops, the share of employment in services is considerably increased. In short, the higher the development and per capita income of a country, the greater will be the share of the service sector in the Gross Domestic Product (GDP).

Despite the growing contribution of this sector in the world economy, the service definition is not very clear, especially because when a (tangible) good is delivered for adding value through services and delivery of a service for aggregate values for a property or properties. Hoffman and Bateson (2003) argue that it is difficult to define a pure service or a pure good. A pure good implies that consumer gets only the benefits from the good, without any added value of service. The same concept applies for the pure service, i.e., a good could not be offered when a service is performed. However, a pure service or a pure good could hardly be offered. The authors give

the example of tangibility of services: bank statement, vehicle repair including new parts. In the same way, goods add some kind of service, such as delivery. Therefore, a pure service can be considered as any activity or benefit, essentially intangible, offered by one part to another without resulting in the ownership of a good (Kotler, 1998; Lovelock, WRIGHT, 2002).

According to Vargo and Lusch (2004), a service implies the execution of competences (skills and knowledge) by means of acts, processes and performance for benefiting another entity (organization or end user). This conception of service is broader and considers that the even the suppliers of goods (tangible) may combine services (intangible) in its processes as a way to add value to customers and to increase its own competitiveness in the market.

Traditionally, the main features of services are presented as follows:

**a) Intangibility:** services are ideas and concepts which cannot be felt, seen, heard, inhaled or even tested before being acquired (SIMIÃO, 2007). In this way, the user does not experience the service being provided, making it difficult to review by the customer even with the supplier orientation (BARBÊDO, 2004);

**b) Inseparability:** services are created and consumed simultaneously. Therefore, they cannot be stored. According to Barbêdo (2004), a service is produced while being consumed. In this sense, any error in the production is perceived immediately by the customer;

**c) Variability:** services do not have the consistency of goods during the production process. They vary widely since they depend on whom, when and where they are being executed (Gouvêa, Yamauchi, 1999);

**d) Perishability:** a service is a perishable product. It cannot be stored. It will be lost, if not consumed. The full utilization of service capacity becomes a management challenge, once customer demands change over time, so they cannot form inventories to meet demand fluctuations (Fitzsimmons, Fitzsimmons, 2003).

The features aforementioned differentiate services from goods. However, they cannot be generalized for all kinds of services. A video lesson, for instance, can be recorded, stored and even experienced before its actual consumption. Another important aspect to be considered in the differentiation of goods and services is the creation of value. According to several authors (Vargo, Lusch, 2004; Kersten, Koch, 2010; Grönroos, Ravald, 2011), service providers on its own are not able to create value, since the capacity to do so is restricted to

consumers. However, service providers have an advantage, because once services are provided and consumed at the same time, suppliers can influence clients on the perception of quality and, consequently, on the value creation, i.e., as the service provider becomes co-producer of value, contributing to value creation for customers.

Given the specificities presented above, a marketing professional be able to know and manage the various marketing mix elements, that might influence the clients' perception of quality of services, seeking to meet the desired expectations and, consequently, their needs. It is worth noting that some authors differentiate the traditional marketing, analyzed through 4Ps (Product, Price, Place, and Promotion), of marketing of service, based on the 7Ps (Product, Price, Place, Promotion, People, Physical evidence, and Processes). In this study, however, we opted for a third approach known as industrial marketing, which also uses 4Ps, based on Colares-Santos' (2012) recommendation. The author showed, through a factor analysis, that industrial marketing would be more appropriate to analyze the customer satisfaction of intermodal terminals.

## Satisfaction

Customer satisfaction can be understood as an affective state caused by an emotional reaction to the purchase experience or consumption of a good or service (Oliver, 1977; 1980). According to Woodruff and Gardial (1996), the satisfaction is linked to customer perception over the performance of the product and the comparison with a standard that represents the performance of the product the user expected. For Bei and Chiao (2001), satisfaction is the feeling originated from the comparison between the real benefit and the purchase cost with the expected level of benefit. After this evaluation process, positive or negative feelings are generated. The failure to meet customers' expectations is seen as the cause of dissatisfaction (Hallowell, 1996; Blackwell et al., 2011). In short, satisfaction is a trade-off between the expected performance and perceived performance. That is, if the performance of a good or service achieves the expectations, the customer will be satisfied; if the perceived performance falls short the expectations, the customer will be dissatisfied (Blackwell et al., 2011).

The concept of satisfaction is related to the analysis of a specific transaction, expressed in a moment post-purchase or consumption of a good or service, in which the client evaluates a one-off transaction (Hallowell, 1996; Anderson, Fornell, 2000). However,

satisfaction could also be expressed as a cumulative process from a set of experiences that the customer experienced along the purchase or consumption of the good or service in question (Oliver, 2009). In this sense, Fornell et al. (1996) assures that satisfaction is based on the global consumption experience of goods or services in a given period of time (i.e., a generic assessment based on multiple transactions with a product). Additionally, Révillion (1998) states that satisfaction is a global assessment with regard to purchasing consumption experience of goods and services so far. This meaning of satisfaction emphasizes that prior-purchase consumption experiences are aggregated at each new experience, providing more criteria to users evaluate their last transaction.

One of the benefits to assess the consumer satisfaction through a particular perspective is that it captures the psychological reactions that the client has regarding the performance of the good or service in a particular occasion (Oliver, 2009). This fact allows managers to correct certain patterns and review each new transaction (Marchetti, Prado, 2001). On the other hand, the benefit of analyzing the customer satisfaction through global perspective, i.e., based on accumulated satisfaction of several experiments, lies on the fact that cumulative satisfaction provides an indication of the current and long-term performance of a company or product (Rossi, Slongo, 1998). In this paper, we adopted the approach that comprises the cumulative satisfaction because it offers a better conceptual adjustment of the constructs employed.

A variety of techniques might be used to assess user customer satisfaction. However, the main ones are based on the disconfirmation paradigm. With regard to models based on disconfirmation of expectations, a list of those which aim at measuring satisfaction is presented in Marchetti and Prado (2001). Amongst them are those based on the relation between expectations and performance; perceived performance; weighted performance by importance; and, a relation between a performance of minimum acceptable level and desired level. These models aim at assessing satisfaction through attributes, making it possible to identify of particularities of operations in the company.

We opted to use the weighted performance by its importance model (Fishbein, 1963; Martilla, James, 1977). This model assesses customer satisfaction through the importance score given in each attribute and each own performance score. Algebraically, the satisfaction score is expressed in the Equation 1:

$$ESCi = \frac{\sum_{i=1}^{ni} (Pi - Ei)}{ni} \quad (1)$$

Where  $ni$  is the number of valid cases for the item  $I$ ,  $Pi$  is the perceived performance and the expectations of the consumer (Marchetti, Prado, 2001).

Thus, consumer satisfaction is verified through the subtraction of the perceived performance score from the expectation score. In other words, the higher the score, the greater the difference between expectation and perceived performance. It should be highlighted that a positive value indicates satisfaction, whilst negative, dissatisfaction.

## Materials and methods

First of all, it must be clear that our analysis was based on customers' perception about service provided by operators of grain intermodal terminal in the Brazilian logistic chain. In order to accomplish our goal, we carried out a survey with 54 customers (rural producers, agricultural trading companies, and agricultural cooperatives) of intermodal terminals intentionally sampled throughout the five regions of the country. We were forced to adopt this selection criterion since there was not any reliable information about the quantity and location of those clients, and also due to time and financial constraints.

A structured questionnaire was designed according to marketing mix for industrial services. It is important to mention that a pilot test was conducted through in-depth interviews with five senior managers of grain intermodal terminals prior data collection takes place. To reduce the variability of the answers, the data were collected in two ways (35 face-to-face interviews, and 19 phone interviews) during the months of August to November 2011.

All four marketing dimensions were represented through 15 variables measured by Likert scale ranging from 1 (not important) to 5 (very important). The application of the questionnaire was divided into three parts. Firstly, customers were asked to scale variables 1 to 14 on how important each variable should perform with regard to services provided by the intermodal terminals in general. Secondly, according to their perceptions, customers were asked to scale the same 14 variables taking into account the service provided by the terminal which they traded. Finally, in the third part, the customers assessed

their overall level of satisfaction (variable 15) regarding the services provided by the terminal they traded.

**Table 1: Variables used in the empirical study**

Variable	Author
1 - Variety of products/services	Fitzsimmons and
2 - Receiving and processing capacity	Fitzsimmons (2003);
3 - Office/waiting room cleanliness and environmental condition	Hoffman and Bateson (2003); Souza (2006);
4 - Level of infrastructure modernization of the terminal	Calarge (2010); Kersten and Koch
5 - Assurance of the maintenance of product standards	(2010); Sogabe (2010); Santos (2013) Landivar (2014)
6 - Quickness of service execution	
7 - Standards adopted by terminals	
8 - Price competitiveness of the terminal	Fitzsimmons and Fitzsimmons (2003); Bei and Chiao (2001); Hoffman and Bateson (2003); Machado and Lima-Filho (2006); Souza (2006); Calarge (2010)
9 - Negotiation flexibility	
10 - Terminal location	Fitzsimmons and Fitzsimmons (2003); Hoffman and Bateson (2003); Souza (2006); Calarge (2010)
11 - Communication between terminal and customer	Kolesar et al. (1998); Fitzsimmons and
12 - After-sales support	Fitzsimmons (2003); Kahtalian, (2002);
13 - Staff ability to serve customers	Hoffman and Bateson (2003); Souza (2006);
14 - Nice, friendly and gentle staff	Kersten and Koch (2010); Calarge (2010)
15 - Overall satisfaction with the services provided	

Data analysis was divided into the following three steps. Firstly, we standardized the data in order to improve the relationship among variables (Hair et al., 2009). Secondly, we used the Multiplicative Approach using the first 14 variables of the

questionnaire. According to Fontenot et al. (2005), this approach assumes. The dissatisfaction score is obtained through the difference between the highest possible score of importance, e.g., 5 to very important, and the score is given by the client regarding the terminal he trades. The dissatisfaction score is then weighted by multiplying the dissatisfaction scored obtained previously by the mean of the importance declared by the customers. The core of weighted dissatisfaction is used to prioritize areas of improvements. The variables are ranked in descending order of weighted dissatisfaction score. Mathematically, the Multiplicative Approach technique is calculated by the following Equations:

$$WSS = SS \cdot \bar{I} \quad (2)$$

where

$$SS = (5 - \bar{P}) \quad (3)$$

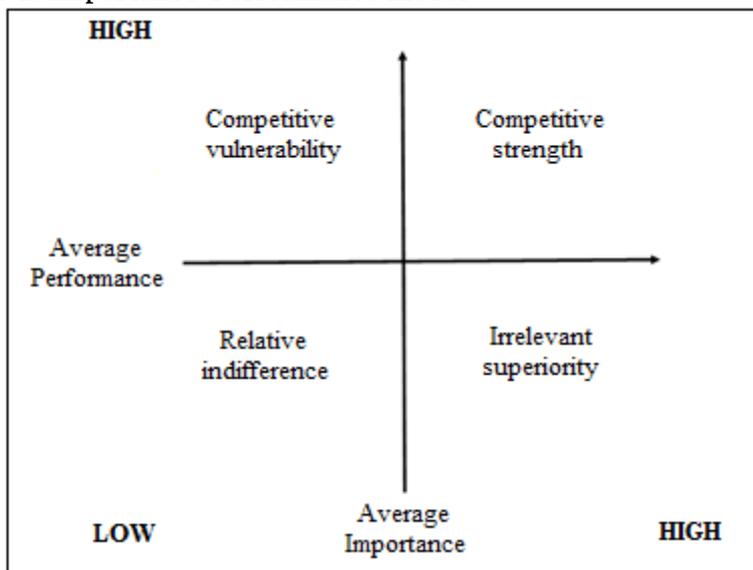
*WSS = Weighted Satisfaction Score;*

*SS = Satisfaction Score;*

*$\bar{I}$  = Mean of Importance;*

*$\bar{P}$  = Mean of Performance.*

Finally, we applied the Importance-Performance (I-P) model (Martilla, James, 1977). This technique is based on the client's evaluation of "importance" and "performance" for all variables, calculating the average of the responses and then plotting the results in a matrix of two axes: x-axis represents the level of performance, while y-axis refers to level of importance (Figure 1). The axes intersect each other, forming four quadrants as follows: (1) the competitive strength: satisfaction and importance of each variable are above average; (2) irrelevant superiority: importance is below average but satisfaction if above average; (3) competitive vulnerability: importance is above average while satisfaction is below; and, (4) where satisfaction and importance are below average.

**Figure 1:** Importance-Performance model

Source: Adapted from Martilla and James (1977, p. 78)

In the next section, we present our results and discussion.

## Results and discussion

### Assessing dissatisfaction level

Through the dissatisfaction score provided by the Multiplicative Approach technique, it is possible to visualize how dissatisfied customers are regarding the analyzed variables. Thus, this data may turn into valuable information about what variables managers should focus attention in order to fix possible flaws, and, therefore, meet client's needs more effectively. According to this technique, the higher the weighted dissatisfaction score of certain variable, the higher the attention it should receive.

We classified the dissatisfaction scores into three groups with the purpose of simplifying the analysis. The first group, represented by scores close to the arithmetic mean of a given variable, was named Average Dissatisfaction. In order to delimit the range of scores belonging to the group Average Dissatisfaction, we took one standard deviation above and below the average. By doing this, we consequently defined the High Dissatisfaction and Low Dissatisfaction groups.

The results presented in Table 2 show that the variable with the highest score of dissatisfaction according to grain intermodal

terminal's clients is the "Receiving and processing capacity" (1.28), followed by "Level of infrastructure modernization of the terminal" (1.19), and "Quickness of service execution" (1.02). These three variables were classified as High Dissatisfaction and are related to the marketing dimension "Product", suggesting the need of investments in infrastructure by grain intermodal terminals' operators. Kersten and Koch (2010) argue that receiving, processing, and storage capacity, as well as other resources, may influence the perception of quality and value creation by customers, even when they are not being effectively used. This finding corroborates what was stated by Calarge (2010) about the obsolescence of infrastructure in some terminals.

**Table 2:** Hierarchy of dissatisfaction of the marketing mix in grain intermodal terminals in Brazil

Marketing Mix	Ranking of variables	Dissatisfaction Weighted Score	Level of Dissatisfaction
Product	Receiving and processing capacity	1.28	High
	Level of infrastructure modernization of the terminal	1.19	
	Quickness of service execution (reception, transshipment, and others)	1.02	
Price	Negotiation flexibility	0.5	Average
	Price competitiveness of the terminal	0.29	
Product	Variety of products/services	0.15	
	Standards adopted by terminals	0.03	
Promotion	Communication between terminal and customer	-0.02	
	After-sales support	-0.04	
Product	Office/waiting room cleanliness and environmental condition	-0.23	
Promotion	Staff ability to serve customers	-0.3	
Product	Assurance of the maintenance of product standards	-0.44	
Promotion	Nice, friendly and gentle staff	-0.63	
Place	14 - Terminal location	-2.8	Low

"Negotiation flexibility" (0.50), and "Price competitiveness" (0.29) were classified as Average Dissatisfaction. Interestingly, these two variables are related to the dimension "Price" of marketing mix, pointing out to certain degree of dissatisfaction by customers on the conditions offered by terminals' operators, especially the way the price of services have been negotiated and stipulated.

The variable "Variety of products/services", with Dissatisfaction Score 0.15 relates to the Product dimension and was rated Average Dissatisfaction. Regarding this variable, the Dissatisfaction Score shows that intermodal terminals are not meeting all the customer needs. As stated by Calarge (2010), customers demand a wide range of services, such as storage, cleaning, and drying of grains, but most of the terminals' managers declared to have no interest in offering these secondary services, once the main efforts should be concentrated on the transshipment of grains.

The variable "Standards adopted" by terminals, also related to the Product dimension, refers to the rules, policies and procedures of the terminals. It presented Average Dissatisfaction Score (0.03), showing that customers and terminals' operators opinions diverge. The adoption of proper procedures, rules and policies by organizations can influence the perception of quality by users of services (Fitzsimmons, Fitzsimmons, 2003; Hoffman, Bateson, 2003). Thus, terminal managers should be aware of this variable.

The variables "Communication between terminal and customer" (-0.02), and "After-sales support" (-0.04), related to the dimension "Promotion", show that the terminals are not being clear and effective in serving their customers. The communication with clients becomes important because it is how companies use to promote their services, prices, and possible discounts, as well as any other element that may persuade the client to choose the services offered. A frequent mistake committed by enterprises is to inflate clients' expectations through desirable promises that, in practice, are not provided (Kahtalian, 2002). This situation was observed in Calarge (2010) when, according to a customer's opinion, terminals were found to sell more capacity than they actually have, often jeopardizing customers' operations, even if services were previously contracted. After-sales support, as described by Kolesar, Ryzin and Zutler (1998), seeks at narrowing the relationship between the organization and customers through the analyzes if the expectations about the service delivered are being met. The score of dissatisfaction found to this variable shows that terminals are not using this practice accordingly.

It is worth noting that in the industrial marketing the complexity of the industrial sale and the dependency between buyer and supplier tend to generate the maintenance of relationships, creating a long-lasting advantage (Webster Jr., 1991; Williamson, 1993). It means that even if part of customers are dissatisfied, they might continue transacting with each other, since the rupture of a relationship tends to be more costly than a change of a supplier.

The variable "Office/waiting room cleanliness and environmental condition" was also classified as Average Dissatisfaction (-0.23), suggesting the need for investments in the infrastructure of the terminal for better serve clients, in general, including truck drivers. Fitzsimmos and Fitzsimmos (2003) state that esthetic aspects can cause remarkable effects on customer's perceptions and behaviors of customers, as well as can affect the performance of services that the staff performs. Thus, the lack of attention to this attribute can provide an unpleasant atmosphere in the environment, both to company's own workers and clients.

The variables "Employees ability to serve customers" and "Nice, friendly and gentle staff" reached Average Dissatisfaction, with scores -0.30 and -0.63, respectively. These two "Promotion" dimension related variables refer to the ability to identify and solve customers' concerns. Their dissatisfaction scores point to the need of improvements in qualification and training of intermodal terminals' employees. Kersten and Koch (2010) argue that the potential of a service company is manifested by its staff's qualification, competence, knowledge, and confidence. With regard to the industrial marketing, according to Moreira (2006), the idea that a simple helpful or friendly attitude of the staff might be a competitive advantage to differentiate from competitors is flawed. This statement seems to be reasonable because in business marketing the relations between the seller and buyer are interdependent, often uncontrollable and involve a lot of actors. That being said, it is important to adopt a clear policy, previously defined and consolidated in order to maintain the transactions.

The variable "Assurance of the maintenance of product standards" with a dissatisfaction score of -0.44 also reached Average Dissatisfaction. This variable refers to an intermodal terminal capability to deliver the product in conditions previously contracted. The degree of dissatisfaction obtained for this variable shows that terminal operators are not meeting the contracted compliances, implying the need of improvements in quality control systems,

management practices or perhaps to reconfigure terminal facilities, for example.

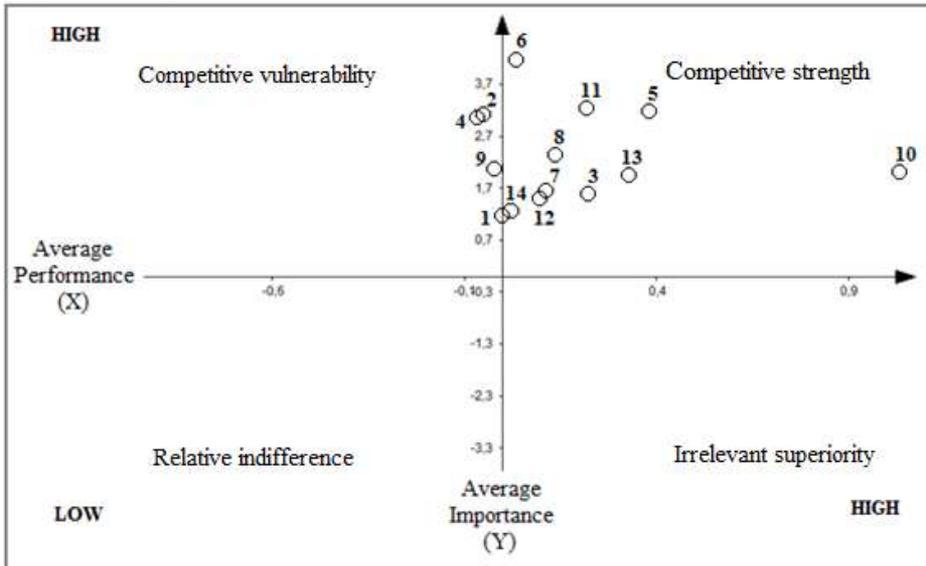
Finally, the variable "Terminal location" with dissatisfaction score of -2.80 was classified into Low Dissatisfaction group. With the lowest degree of dissatisfaction, this variable shows that intermodal terminals are installed in a good location and have good access, and, therefore, can be considered a strong competitive force. It is worth mentioning that a larger network of properly located terminals could optimize the operations in the grain logistics system by reducing losses and consequently enhancing the competitiveness of the national agribusiness as a whole (AMARAL; ALMEIDA; MORABITO, 2012).

By applying the Multiplicative Approach, we were able to identify strengths and weakness that intermodal terminals' managers should prioritize investments according customers' point of view. Among all, variables related to "Product" dimension, mainly infrastructural aspects, we found to have the highest dissatisfaction level.

### **Importance-Performance model**

In this section, we applied the Importance-Performance model in order to emphasize the results found in the previous section. As seen in Importance-Performance matrix (Figure 2), since clients considered the variables Receiving and processing capacity (2), Level of infrastructure modernization of the terminal (4), and Negotiation flexibility (9) as highly important, but terminals received a low performance score for these variables, they were classified as Competitive Vulnerability. Once again, the Terminal Location (10) received a positive evaluation.

**Figure 2: Importance-Performance matrix**



It is important to mention that the variables classified as Competitive Strength do not necessarily can be classified as satisfactory by the customers. In this case, as we showed thought the Multiplicative Approach technique, they were below client’s expectations. We did not find any variable classified as Relative Superiority, and Relative Indifference, reinforcing the hypothesis that clients tend to consider everything very important (Garver, 2003).

In order to validate the results obtained through the Multiplicative Approach technique, and Importance-Performance model, we assessed clients’ overall satisfaction using a 5-point Likert scale, where 1 would be displeased, and 5, very satisfied. The average score found was 3.11, which is considered as Average Satisfaction. It is worth noting that Average Satisfaction represents certain degree of neutrality, which may be considered a risk factor for the terminals, since it is not being ensured the full level of customer satisfaction and any misstep may bring the satisfaction level down.

**Final Considerations**

This work brings relevant contributions at empirical and theoretical levels. With the decrease of prices of agricultural commodities in the past years, Brazil needs to rapidly improve its logistics sectors in order not to lose the existing competitiveness. In

this work, we have sought to provide some empirical evidence about customers' satisfaction of grain intermodal terminals in Brazil. In order to accomplish that, a survey was conducted with 54 customers in the five major Brazilian regions. The Multiplicative Approach technique and Importance-Performance model are used as the main techniques to analyze the collected data.

Through the results found from the Multiplicative Approach technique, it is suggested that the "Product" dimension has the highest level of dissatisfaction, followed by "Price" dimension. Hence, these two dimensions should be prioritized by terminals' operators, specifically the following variables: "Variety of products/services (1); "Receiving and processing capacity (2)", "Level of infrastructure modernization of the terminal (4)", "Quickness of service execution (5)", "Price competitiveness of the terminal (7)" and "Negotiation flexibility (8)".

The Importance-Performance matrix reinforces the findings obtained in the Multiplicative Approach when the variables "Level of infrastructure modernization of the terminal (4)", "Receiving and processing capacity (2)", "Negotiation flexibility", and "Variety of products/services" were positioned as critical points. As customers claimed, terminals' operators should strive to reformulate their marketing strategies, considering at offering additional services and better negotiation conditions in order to increase client's satisfaction level. Thus, we might conclude that terminals' operators tend to adopt a product/service-oriented strategy, rather than a market-driven strategy.

Despite the relevance of the findings, our results cannot be taken as conclusive due to our sample limitation. Thus, further research should be conducted with a larger sample in order to provide a generalization of the results. Comparisons between different countries and addition of new variables could contribute to clarify and solidify the theory.

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