

# EVALUATION OF THE BRAZILIAN LOGISTIC PERFORMANCE IN THE LPI INDEX

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## **ABSTRACT**

*Due to the opening of the international market, with Brazil's increasing participation in exports and the consequent concern with its competitiveness, it is important to know in detail the performance of the country's logistics practices. To conduct this study, it was used the LPI (Logistic Performance Index), a ranking developed by the World Bank, which measures the performance of commercial logistics of the countries, that is intended to assist in the development of public policies, private sector and their trading partners to understand the challenges they face to reduce the logistical barriers to international trade. Through a literature review, the performance of the Brazilian logistic in the LPI indicator was analyzed and the most critical obstacles that hampered its competitiveness of the country were identified. The figures show that Brazil's performance can be improved, as it was ranked 55th in 2016, having already ranked 41st in 2010.*

**Key words:** LPI; International logistics; Performance Indicator; Foreign Trade.

## **1. INTRODUCTION**

The dynamics of globalization of markets and rapid technological advancement, evidenced from the 1980s, were motivating the construction of a transformer panorama in the world economy, where organizations have come to realize the need and importance of information exchange, expansion of border negotiations and increase their production, considering the strategy of operating on a larger scale and lower costs (CONCEIÇÃO, 2013).

Measuring the performance of business processes has become a central issue both academia and business, as organizations are constantly challenged to achieve effective and efficient results to remain competitive. The application of performance indicators for this purpose ensures alignment with

business strategy, providing a holistic view of the organization's performance, considering different perspectives of performance (VAN LOOY et al., 2016).

Time and quality have become challenging aspects of production in transnational markets. However, logistics processes have become important because of the strategic function, especially when performed in a systemic way and reflecting efficiency in the search to meet the demands of customers, who are increasingly demanding (BIZOTTO et al., 2011).

The manufacturing processes implemented several alternatives to aggregate values to the products, however, in the general scope the organizations realized that the competition in a sustainable way was not only based on the quality and price, but it emphasized the need of a comprehensiveness by the rationalization of time and cost (DUPAS, 2007).

Organizations, finding that it was necessary to maintain a transport of products to meet exports in a more efficient and efficient way, realized that logistical management and international operations constituted a huge challenge and also a relevant element impact on corporate strategy (DORNIER et al., 2007).

Leite (2009) describes that logistics is the activity whose purpose is to provide goods and services produced, in the right place, in time, in the quantity and quality in which they are compatible with the needs of consumers and users. Logistics has evolved from a mere area that managed inventory to become a strategic sector of organizations.

A system that provides efficiency in logistics operations, especially in the international market, according to the considerations of Ballou (2006), is consolidated as responsible for building the necessary support for the execution of a set and expressive trade. Also, it stands out in the maintenance of the high performance of developed countries, highlighting the possible factors to be exploited by certain competitors to achieve competitive advantages, usually related to logistics costs. Ballou (2006) also emphasizes the association between efficiency in the logistics system and the progress of a country, considering that the lack of this force induces countries to a relatively low standard of living, characterized as underdeveloped, facing the barriers to the exchange of products.

For the World Bank (2016a), there are several components that interfere with performance logistics of a country and, moreover, reports that all methods and procedures implemented may reflect their costs and quality of services and processes, in a direct way reflecting on its logistics operations system.

Ludovico (2007) explains that due to the opening of the international market, with the increasing participation of Brazil in exports and, consequently, increased concern about competitiveness, made evident the importance of knowing in detail the performance of logistics practices. Thus, in order to contribute to the development of comparative logistics performance between countries, the World Bank released in 2007, 2010, 2012, 2014 and 2016 the Logistic Performance Index Index (LPI) (World Bank, 2016b).

The LPI has the prerogative to synthesize the logistics performance of the countries through the use of indicators, considering six areas: customs; infrastructure; international shipments; quality and logistics competence; track and tracing; and predictability. The use of IPL makes it possible to perform diagnoses in search of opportunities and challenges for each country (BAZANI, 2017).

Therefore, this study aims to investigate, through a bibliographical review, the performance and the use of indicators in Brazilian customs and its impacts on the performance of the country in the international market. The research is justified by the scarcity of literature on the methods of measuring the country's logistic performance, corroborating the need to identify opportunities for future research

in this area, providing subsidies for the continuous improvement of the Brazilian logistics sector, with a view to greater competitiveness conditions that ensure a positive impact on the economy.

## **2. LOGISTICAL PERFORMANCE**

One of the major challenges faced by organizations, when competition and competitiveness are evident, is the ability to establish a holistic view of the business, to undertake a dynamic in the company to achieve the performance directed to the consumption demands, through the implementation of new technologies, expansion of markets and use of management method, aiming at the reconstruction of processes and systems, as well as the adaptation of the company to the scenario of its segment (SLACK; CHAMBERS; JOHNSTON, 2015).

According to Costa Junior (2012), indicators can be defined as visual or numerical representations that express the situation of a particular activity. The term "performance measurement" generally refers to the continuous collection of data from specific functional areas. It is the continuous monitoring and reporting the progress of the area in question to achieve their organizational goals. It consists of an internal system that collects, gathers and reports workflows, products and results (IRELAND et al., 2011).

Performance indicators are used by various organizations, called KPI, an acronym for English, which stands for Key Performance Indicators. Through the use of KPIs, the company can monitor and control production processes, manage activities, monitor goals and objectives. In addition, it is also an important tool that allows the possibility of verifying trends, identifying risk factors, focusing on improvement works and validating the actions implemented by the organization (COSTA JÚNIOR, 2012).

Performance indicators are important for the organization that wants to know the level of efficiency and effectiveness of its production processes. Each sector of the company establishes the indicators that can respond as is the performance of certain activities. However, this is a procedure that usually occurs in administrative management, but from the same perspective, logistics, as an activity that can add value to the product, has in its activities the opportunity to institute specific indicators that may reveal its performance (BAZANI, PEREIRA, LEAL, 2017).

Logistic performance impacts on the results of the organization, whether in the internal dimension, which represents the actions in the national scenario or foreign trade. Therefore, logistic performance indicators should always be carefully evaluated, not only by the exporting companies, but also by the government agencies involved in this process (BAZANI, 2017).

### **2.1 Logistic performance indicators**

Competitiveness established itself as an important event and becomes part significantly in the everyday thinking of organizations. Therefore, they seek to observe the scenario in which they find themselves and create means of evaluating performance, in order to measure the overall performance of the company, since by the use of a process monitoring procedure it is possible to know the performance of the main events of the organization, being able to contemplate financial measures or not, being they qualitative or quantitative, as long as they are worked and sustained according to their own metrics (ARAÚJO; ROCHA; OLIVEIRA, 2016).

The importance of controlling the efficiency of the production process through the application of performance indicators has been intensified, which has prompted other areas to adopt this evaluation

model. Logistics was an area that adhered to this practice, and began to monitor the characteristics of the activities that interfere with its performance (ARAÚJO; ROCHA; OLIVEIRA, 2016).

According to data from Brazil (2009), the indicators are applied to evaluate a given occurrence, locate and know the problem situation, consisting of elements for analysis and control of activities, as well as contribute to decision making. The performance indicator is a number, percentage or ratio, which is intended to represent the performance in order to make comparisons with the previously planned objectives.

Also according to Brazil (2009), some points are considered important for the elaboration of performance indicators, such as: identification of levels and objects to be measured; establishment of performance indicators; validation of the indicators with the parties involved; construction of procedures and formulas, as well as goal setting; definition of those responsible; establishing collection and data processing systems; final confirmation of the concept and structure of the indicators with stakeholders; measurement of the results obtained; analysis and interpretation of indicators in their notes and manner of action; and finally, communication of identified performance and management of necessary changes.

For Kaplan and Norton (1997), what is not measured can not be managed. In this way, they consider that nations need to rethink their strategies and operational procedures to achieve competitive advantage in the international market. With regard to the movement of goods, it is necessary to use indicators to carry out the monitoring and control of activities, aiming at evaluating performance over time.

Several class entities and study groups have intensified their efforts to subsidize procedures that are undertaken in foreign trade as alternatives for the evaluation and comparison of the logistics operations of each country. Thus, to evaluate logistic performance, three methods can be used: macro analysis, based on national accounts; micro evaluation through company surveys; and focus on the survey rates (FATTIBENE et al., 2012).

According to the World Bank (2016th), understanding the relationship between performance logistics and international market, and what are the barriers of trade flow of a country, it is essential to adapt and search for better performance. From this point of view, it has been highlighted the forms of verification carried out by means of representative numbers of the logistic performance of foreign trade, with direct action for the aspects of logistics costs, quality of services, infrastructure, time for export and import, geographic issues and the regulatory environment.

In general, a procedure for the assessment of logistics performance needs to be structured and take into consideration factors that go beyond the costs of logistics operations, it is fundamental to analyze the relationship of the added value of the logistics for the Gross Domestic Product (GDP). Through this perspective, governments establish national logistics policies, which should have their indicators updated regularly by the official departments, allowing the country to improve its performance in terms of the flow of foreign trade (BAZANI, 2017).

Ireland et al. (2011) and the World Customs Organization (WCO, 2012) describe that the Time Release Study (TRS) is designed to measure the time required to release a cargo and can be applied at customs or at any border agency (or departments that act in the physical control of goods). It is, therefore, an indicator that has the potential to detect flaws and opportunities to improve border and logistics procedures.

The World Economic Forum, in its activities, also instituted its own index of performance for situations related to international trade, called the Enabling Trade Index (ETI). It is an index that

considers some points, such as: accessibility to the domestic and international markets; efficiency for customs performance and for import and export procedures; decisions and implementations carried out by the customs administration in a transparent manner; among others (LAWRENCE; HANOZ; DOHERTY, 2012).

In this line of action, the World Bank proposed a multidimensional model, which is the LPI (Logistic Performance Index), as a strategy for evaluation in the dimensions by which international logistics is present, and may suffer interference in performance, affecting the final result, not only an organization but the country as a whole. The international LPI is aimed at assessing customs, infrastructure, international shippers, quality and logistics expertise, monitoring and tracking, predictability / timeliness. The national LPI, however, aims to measure time, costs, distances and documentation (BAZANI, 2017).

The LPI concentrates indicators established by the World Bank, which consider the logistic aspects of the countries, by national and international vision. These are performance results that demonstrate the country's situation when observed along the supply chain (BAZANI, 2017).

## 2.2 LPI (Logistic Performance Index)

The LPI measures the performance of commercial logistics, helping public policy development, sector agencies, and private sector operators to understand the challenges that them and their trading partners face in reducing logistical barriers to international trade. Working with the application of statistical techniques, which make the convergence of information to a single indicator. This result allows the comparison between countries, regions and income groups, in addition to making diagnoses for each country individually (BANCO MUNDIAL, 2016a).

The Institute for Studies in Industrial Development (IEDI, 2010) explains that the methodology for implementation indicators in order to determine the LPI index has observation for six factors that influence the quality of logistics: 1) efficiency in customs clearing activities; 2) quality presented by the infrastructure for carrying out transport associated with commerce (ports, airports, railways and highways); 3) facility for organizing a shipment at a competitive price; 4) competence and quality of the local logistics sector; 5) capacity and knowledge to perform tracking and load of cargo; and 6) punctuality achieved and consolidated by the constancy with which the shipment is delivered to its destination, respecting the term that was planned.

Internationally, LPI has been active since 2007, and is published every two years, presenting results according to established dimensions, as can be seen in Table 1.

**Table 1:** Indicators that compose LPI

| Components analyzed                          | Description   |
|--|---|
| Customs                                      | Efficiency of procedures by customs and other border agencies                                   |
| Infrastructure                               | Transportation quality and IT infrastructure for logistics                                      |
| Competence and Quality of logistics services | Competence of the local logistics industry  |
| Tracking and tracing                         | The ability to track and trace consignments   |
| Timeliness                                   | The frequency with which shipments reach consignees within scheduled or expected delivery times |
| Ease of arranging shipments                  | The ease of arranging competitively priced shipments  |

Source: Fattibene et al., (2012)

In 2016, 160 countries participated in the benchmarking process, which allowed, in addition to the qualitative observations in the six established dimensions, to identify quantitative variables, such as the relation to export and import times, total costs of export and import agencies, inspections and clearances (WORLD BANK, 2016a).

According to the World Bank (2016a), only information related to time and cost is insufficient to assure assessments for the elaboration of infrastructure investment plans (railways, highways, ports, airports and waterways), improvement of services and processes customs of the country and optimize the flow of its production, in addition to increasing transparency in the process, guaranteeing the quality and reliability of the service.

The information for the construction of these indicators is obtained through the application of a specific questionnaire to the companies involved in the logistics chain and also to the contractors of this type of service. Then, through the application of statistical techniques, the numbers are generated and the countries are classified according to their results in each of the dimensions evaluated, with notes following the Likert Scale, from one to five, one for poorer performance and five for more favorable performance (WORLD BANK, 2016a).

In World Bank (2016a) considerations, the logistic dimensions evaluated are interrelated. The indicators of customs, infrastructure and quality and logistic competence refer to the inputs of the supply network and, with these indicators, the indicators predictability, monitoring and tracing, and international shipments are established as responses.

The World Bank (2016a) emphasizes that the inputs are related to the policy actions adopted and, as a result, come the performance evaluation. It is concluded, however, that the improvement in infrastructure, minimization of bureaucratic factors evidenced at customs posts, improvement of levels of logistics services, from small service providers, perfectly reflect the control of remittances through the application of monitoring, tracing and contingency adaptability, if necessary, in addition to punctuality and satisfactory management flows with the reduction of logistics costs.

Each logistic performance indicator established by the World Bank aims to reveal the reality that presents the export operation at a specific point and indicate the opportunity for improvement.

### **2.2.1 Customs**

Customs is the sector with the responsibility of supervising the entry and exit of goods in the country and, for that, it follows a control plan that regulates the borders. It includes in its attributions to collect taxes that affect the foreign trade. Customs efficiency stems from the work carried out by customs agents, managers and service providers, generally involved in this process, in addition to the Ministry of Industry, Foreign Trade and Services (MDIC) (BAZANI, 2017).

Customs have the mission of containing illicit practices by controlling the flow of trade, however, they can not constitute a barrier to export or import. For this reason, the measurement of performance aiming at the success of international transactions is important, being possible to focus on aspects such as taxes, time for customs clearance, compliance with legislation, among others (BAZANI, 2017).

The "customs" performance indicator addresses the efficiency of routine customs activities, as well as customs clearance procedures, such as: physical inspection, electronic submission, release before and after arrival, audit and transparency of customs and administrative procedures, including, among other factors, changes in legislation (FATTIBENE, 2012).

For the World Bank (2016a), customs is an indicator that reveals efficiency in the customs clearance process, comprising: correct, complete and available information; customs declarations expressed

electronically and transparently; imports and exports according to schedule; time between submission of documents to customs and customs clearance in an acceptable time.

### **2.2.2 Infrastructure**

The quality of the infrastructure is fundamental for certain import and export activities, being a factor that interferes in the flow of international trade processes. Analyzing determinants of trade facilitation, it is identified that the precarious infrastructure of the countries along the bureaucracy, corruption and weak regulatory environment, is responsible for an increase in marketing costs, thereby raising the price of goods and compromising the competitiveness of countries (SOLIANI, 2015).

Among logistics costs, transport costs are likely to be affected by the level of infrastructure, since export performance and trade flows generally depend on institutional quality and infrastructure. In Brazil, the precariousness of infrastructures entails, among other problems, congestion in access to port terminals, fleet idleness and cargo theft, which has a negative impact on other indicators (FARIA; SOUZA; VIEIRA, 2015).

For the World Bank (2016a), this indicator, in its agenda, aims to analyze and measure the quality of transport infrastructure, information technology and communication involved, which needs to be demonstrated under satisfactory conditions to respond effectively to the needs from the country.

The relevance of infrastructure and how it impacts the import and export process reinforce the importance of conducting frequent surveys. This indicator has its evaluation by the World Bank (2016b), since it is a dimension of great significance, showing the factors related to the logistics performance of the countries.

### **2.2.3 Quality of logistics services**

The World Bank (2016a) established this indicator in order to evaluate the ability to organize the shipments efficiently, offering deliveries at competitive costs, considering the predictability and flexibility, which are considered important aspects of an effective performance. Also operates in the analysis of the ease and accessibility for the ordering of international shipments, ie, it is the management of the flow of goods.

It is worth mentioning that this indicator has strong interference from other indicators. Factors such as infrastructure and bureaucracy may reflect significantly on transaction costs and therefore affect trade flows. Thus, supportive organizations, which are decisive for gaining competitive advantage, can contribute to facilitate access to logistics inputs and reduce transaction costs (BAZANI, 2017).

### **2.2.4 Competence and quality of logistics services**

This indicator deals with the quality and competence presented by public and private logistics service providers, including the levels of work of shippers and transporters in the road, rail and air modalities, customs brokers and responsible for border activities.

According to the World Bank (2016), countries with low logistics performance usually present problems in public and private sectors, also emphasizing that the inadequacy of the procedures does not allow the existence of competitions, which contributes to corrupt practices at the border. In addition, in countries with high logistics performance, private sector services are more satisfactory.

### **2.2.5 Tracking and Tracing**

Controlling and tracking the goods from their origin to the point of delivery, focusing on the changes of dates and routes that may occur, consists of a dimension established by the World Bank (2016a). In Brazil, this issue is fundamental due to theft and burglary that occur, both on the roads and in the warehouses of the ports (BAZANI, 2017).

According to Faria, Souza and Vieira (2015), a country to be competitive needs to have intense monitoring and tracking, so as to enhance the improvement of aspects related to the quality of information technology in logistics processes, transparency of customs procedures and innovation frequent use of communication technologies.

In this way, transportation management, from the initial point to its final destination, has become an essential activity to increase the level of control and tracking of commercial activities. The high index of performance in this sector is an element that can affect and increase the reliability of logistics services and the safety of goods movements, considering the most diverse situations that may occur in the flow of goods (BAZANI, 2017).

### **2.2.6 Timeliness**

The World Bank (2016a) established this indicator in order to emphasize the importance of the frequency of goods arriving at destinations according to agreed deadlines. The low level of predictability / punctuality leads to a rise in logistics costs and, consequently, causes a reduction in the country's competitiveness in foreign trade.

Faria, Souza and Vieira (2015) understand that not having timely delivery, lacking shipping, needing physical inspections, using outdated communication technologies and having poor transport infrastructure, are fundamental factors that contribute to a low index in the Timeliness indicator.

Finally, time is an element of competitiveness when it comes to freight transport, highlighting the close relationship of this indicator with other dimensions evaluated, such as quality and international shipments. Failure to meet agreed deadlines impacts negatively on these aspects. Emphasizing that, problems in customs and deficient infrastructure, can contribute to the loss of deadlines in the delivery of goods.

However, monitoring and tracking configured as allies so that we can increase the level of predictability / punctuality, as through this indicator is possible to monitor the shipments and make changes and adjustments if necessary (Bazani, 2017).

## **3. METHODOLOGY**

The objective of this article is to evaluate the logistic performance of Brazil in the international market based on the Logistic Performance Index (LPI), presented by the World Bank. The methodology used to carry out this study, based on Perovano (2016), was characterized as a descriptive bibliographical research.

The collection of information for the accomplishment of this study was based on scientific articles available in the electronic libraries SPELL, SciELO, Periódicos Capes, besides the reports and database related to the LPI, for the years 2007, 2010, 2014 and 2016. The information presented in the LPI refers to a set of data concerning various areas of logistical aspects for about 160 countries, released by the World Bank as a stimulus to competition in international trade and development of the global economy (WORLD BANK, 2016).

The information in the LPI database is organized according to the different aspects related to logistics, which are the analyzed variables of this research. Regarding each aspect, for each country, the LPI score is presented as a five-point Likert scale, being 5 for the most favorable situation and 1 for the less favorable situation.

It is justified the choice of the LPI index to carry out the research because it encompasses the logistic dimensions as a whole and not only cost-related issues. In addition, through the LPI, several analyzes can be made for comparisons between countries, making it possible to identify the inefficiencies of the logistics sector.

#### 4. BRAZIL'S LOGISTICS PERFORMANCE

With the metric evaluation system established by the World Bank, the deficiencies and logistical challenges faced by countries and their trading partners were evidenced in the perception of Faria, Souza and Vieira (2015). The gap between the top and bottom performers in commercial logistics is still large, although there has been a slow convergence since 2007, according to a World Bank report. This gap persists because of the complexity of reforms and investments related to logistics infrastructure in developing countries, despite the almost universal recognition that low supply chain efficiency is the main barrier to trade integration in the modern world (WORLD BANK, 2016b).

Bazani (2017) explains that initially, with the results presented, a descriptive evaluation of the logistic performance of Brazil is possible, considering the indicators of the international LPI. The World Bank, in the five published reports, provided information on the international LPI for 150 countries in 2007; in the years 2010 and 2012 contemplated 155; and in the years 2014 and 2016 the total number of participating countries reached 160.

Regarding the logistic performance of Brazil in these editions, the indices are presented in Table 2, giving an overview of the five editions for each indicator, as well as the average and the position in the general classification, ranking.

**Table 2:** Data from Brazil according to the World Bank: International LPI

| Year  | 2007 | 2010 | 2012 | 2014 | 2016 |
|---|------|------|------|------|------|
| <b>LPI General Score</b>                            | 2,75 | 3,20 | 3,13 | 2,94 | 3,09 |
| <b>Ranking</b>                                      | 61   | 41   | 45   | 65   | 55   |
| <b>Customs</b>                                      | 2,39 | 2,37 | 2,51 | 2,48 | 2,76 |
| <b>Infrastructure</b>                               | 2,75 | 3,10 | 3,07 | 2,93 | 3,11 |
| <b>Ease of arranging shipments</b>                  | 2,59 | 2,91 | 3,12 | 2,80 | 2,90 |
| <b>Competence and Quality of logistics services</b> | 2,94 | 3,30 | 3,12 | 3,05 | 3,12 |
| <b>Tracking and tracing</b>                         | 2,77 | 3,42 | 3,42 | 3,03 | 3,28 |
| <b>Timeliness</b>                                   | 3,10 | 4,14 | 3,55 | 3,39 | 3,39 |

Source: Adapted from World Bank (2016b).

The figures show that Brazil's performance can be improved, as it is ranked 55th in 2016, having already ranked 41st in 2010. The indicators "Customs" and "Infrastructure" achieved the best results in 2016; but "Ease of arranging shipments" and "Tracking and Tracing" were better in 2012; and "Quality of Logistics Services" and "Timeliness" with a better position in 2010.

It is important to note that the numbers express the result of an evaluation in which several aspects of a country's logistic performance are considered in each one of the areas indicated by the World Bank as a representative factor for calculating the LPI index. The average of the indicator reflects the overall LPI, and the values are given on a scale from one (least favorable) to five (most favorable). Thus, low numbers indicate a need to assess causes and implementation of improvement plans, aiming to raise the index, thus strengthening competitiveness and the consequent improvement in the position of the international ranking among the countries evaluated.

The results for the year 2016 show that Brazil is located in the cluster of medium logistic performance, according to Table 3 below, expressing the need for improvements to leave position 55th and move towards the top of the table, where countries with more favorable performances are.

**Table 3:** Main competitors of Brazil by clusters

| Cluster   | Countries   |
|-----------|---|
| Cluster 1 | Australia, Belgium, Canada, Denmark, France, Germany, Holland, Italy, Japan, Korea, New Zealand, Switzerland, Spain, UK and USA.              |
| Cluster 2 | Argentina, Brazil, China, Chile, India, Malaysia, Mexico, Poland, Portugal, Thailand, Kuwait, Turkey, Saudi Arabia, South Africa and Vietnam. |
| Cluster 3 | Colombia, Guatemala, Honduras, Indonesia, Peru, Russia, Ukraine and Venezuela.  |

Source: Faria et al., 2015.

It should be noted that the "Customs" in every year was the dimension with the worst performance in Brazil. According to the World Bank (2016a), this indicator is related to the policy actions adopted and reflected in three other indicators: Ease of arranging shipments, Tracking and tracing and Timeliness.

The efficiency index in Customs is a reflection of the performance of the service providers, as well as the repercussion of the bureaucracy that exists in the customs posts. It can be seen that Brazil continues to have a deficit in this factor and, therefore, needs to implement intensified actions of improvements (FARIA et al., 2015).

It should be noted that the "Timeliness" aspect presents itself with a better performance of Brazil in all the evaluations made. However, despite being the indicator with the best result, Fattibene et al. (2012) emphasize that there is no expectation that this is a positive factor for Brazil, since it is an indicator that has to do with the delivery dates of the goods and their non-compliance results in fines, thus raising costs logistics. Overall, the effectiveness of the activities associated with the "Competence and Quality of Logistics Services" indicator and the ability to adapt the unexpected changes related to the "Tracking and Tracing" indicator are fundamental to the good or poor performance of the "Timeliness".

For Bazani (2017), in Brazil, the precarious infrastructure conditions cause, among other problems, the congestion situations to access to the port terminals, the idleness of the transportation and the occurrence of cargo thefts, which reflects in a negative way in other indicators. Even so, the scenario presented by the World Bank's assessment of Brazil's LPI indicators shows a trend of improvement in logistics performance. With the exception of the "Timeliness" indicator, which remained stable in the last two editions of LPI, all other indicators increased, which helped to improve Brazil's efficiency in the overall ranking, increasing ten positions between the 2014 and 2016 editions.

With regards to the competitors, by the cluster formation, using the competition note, Brazil has a medium logistic performance, which shows that the country has advantage over some countries considered as main competitors, which are of low logistic performance. Thus, it is fundamental to identify the deficit dimensions and how the country is positioned within the cluster itself, in addition to seeking to understand which factors differentiate them from the stronger competitors.

Morini et al. (2015) note that, in addition to the Logistics Performance Index (LPI), Brazil's customs rank unfavorably in other rankings made by international organizations such as the World Economic Forum and the Global Alliance for Trade Facilitation, Enabling Trade Index; Institute of Management Development (World Competitiveness Center); Department of Competitiveness and Technology (DECOMTEC) of the Federation of Industries of the State of São Paulo (FIESP); Agility Emerging Markets Logistics Index and other international organizations among others.

However, in view of the results presented in their study, Morini et al. (2015) note that international rankings and methods applied to measure customs performance are directed to a set of indicators associated with the quality of service delivered to the customer and not to the revenue generated by the collection of taxes on international import operations. They are about different aspects, where the overvaluation of one reflects in reducing the competitiveness of the other.

The Modernization Plan of the Brazilian Customs Administration (PMAB) evidences works for the improvement of the process that is carried out by customs in Brazil. In this sense, it should be noted that the most observed and publicized controls in publications and management studies of the Federal Revenue of Brazil (RFB) deal with indicators related to enforcement issues, focused on the execution of actions by customs administrations and other agencies working in the security and enforcement tasks. Thus, Table 4 lists the main indicators used by Brazilian customs.

**Table 4:** Indicators used by Brazilian Customs

| Indicators  | Measurement Type  |
|---|-------------------|
| Degree of compliance with customs requirements on imports                                   | Percentages       |
| Global index of customs inspection (IGFA)   | Percentages       |
| Degree of effectiveness of the selection for inspection in the import dispatch              | Percentages       |
| Degree of fluidity of the import dispatch   | Percentages       |
| Average gross time in the export customs clearance  | Days              |
| Value of seizures from customs surveillance and enforcement operations                      | Millions of reais |
| Goal achievement index of surveillance and customs enforcement operations                   | Percentages       |
| Degree of effectiveness of selection for customs inspection of foreign trade players (IGES) | Percentages       |

Source: Adapted from Brazil (2016)

Thus, in view of the presentations, Morini et al. (2015) emphasizes the importance of considering that the indicators to be set up have the objective of measuring the quality of the service and, thus, improving the level of service and customer service. Performance measurement is important to succeed in modernizing customs procedures. The reasons why countries' customs use performance measurement are varied, among them the pursuit of cost reduction through improved efficiency, the

development of transparency and associated policies, the evaluation of individual work as part of the management process human resources, the fight against corruption, among others.

## **5. CONCLUSIONS**

The Logistics Performance Index, calculated by the World Bank in its fifth edition, presented notes given by professionals in the area in areas such as Customs, Infrastructure, Ease of arranging shipments, Competence and Quality of logistics services, Tracking and tracing and Timeliness. The result of Brazil showed a growth of 10 positions compared to the 2014 ranking (from 65th to 55th among 160 nations), where it fell back after reaching 41st place in 2010 and 45th place in 2012.

According to LPI, logistic inefficiency increases marketing costs and reduces overall integration potential, and this is an issue that must be tackled urgently by developing countries trying to compete in the global market, such as Brazil. Countries with high-quality logistics infrastructures show faster trade and economic growth than countries with low-quality logistics infrastructure.

The development of Brazil in the coming decades depends primarily on massive investments in infrastructure, including cargo transportation logistics. Logistics infrastructure can contribute to economic growth and prosperity, reducing transportation costs, increasing the durability of capital goods and promoting trade and investment.

Given this scenario, it seems clear that the increase in investment levels, especially those aimed at the improvement and expansion of logistics infrastructure, should take priority in Brazilian economic policy, even considering the seriousness of the current political and economic moment. Control and audit these investments are also indispensable if one wants to achieve quick, effective and consistent results.

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