

# **Brazilian foreign trade: a logistics performance index analysis into the global environment**

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## **Abstract**

This study aims, through a literature and specialized documents research, analyzes foreign trade logistics performance, identifying the most critical barriers that hinder Brazilian competitiveness. The obtained results comparing with world class data show an overview to compare against local and global performance, emphasizing the main points to be improved.

**Keywords:** Logistic Performance Index; Barriers; Foreign Trade

## **INTRODUCTION**

Competitiveness has shown to be increasing in the foreign trade segment, stimulated and intensified by the effects of globalization and the constant and frequent technological advances, where a single product can face several competitors and similar cheaper ones in various parts of the world.

Pires (2007) supports this statement when he says and emphasizes the fact that: "With the globalization process, which has been in Brazil since the beginning of economic liberalization started abruptly in 1990, many industrial sectors of the country are now faced with the competition reality on a global scale".

The second half of the 1990s was marked by great global instability, since the global financial system went through many sequential crises in emerging markets which caused some disorder in the Brazilian economy since it coincided with the implementation phase of the Real Plan (a change of currency), challenging monetary policy to control inflation, thus resulting in a few more years to achievement of economic stability. Although it has not been an easy process, this opening proved to be indispensable for economic modernization and fostering the competitiveness of domestic companies.

Pires (2007) states that by saying that: "In theory, it doesn't matter anymore where you produce or under which reality it is produced. What really matters is how you supply a market with products and / or services with a growing set of requirements".

So now, companies try to identify within their production processes, from the opening of the order to the delivery of it to the final customer, which activities add the most and least add or subtract value in its chain and after this identification, companies seek to eliminate everything that may adversely affect or delay the process.

In order to have an effective performance, it is necessary, therefore, the study of the means in which the performance of Brazilian industries that rely on foreign goods, using, for example, devices that work together, to reduce costs or to enable more attractive terms of meeting demand through efficient logistics in the release of their cargo, both when importing or exporting.

Regarding the production process, currently more organizations, especially the industrial ones, make use of the just-in-time philosophy, so apparently it can be said that there are hardly no significant constraints that delay the in-house process. What needs to be done then is to look for solutions that allow the maximization of profits or minimizing the cost of production in the external environment, for example, renegotiation with suppliers in order to increase scale economies or to delay payment deadlines.

When actions such as the adoption of Just in time and other logistics tools are not successful, the expected results and the performance indicators continue to show high levels of costs or delays by extending the average lead time in cargo releases, so the companies start to question if the problem would really be in managing their supply chain or whether the problem may be "out there" where their management cannot act, that means, the external factors that are considered foreign trade barriers and Brazilian logistics constraints, two significant and critical factors to the logistics performance of the national economy.

Coelho (2010) ends his thought by stating that the logistics performance depends not only on costs and time, but also on reliability and predictability of supply chains. In chains without these two elements, for example, there is need for greater safety stocks to avoid disruption of operations, increasing the overall costs. Therefore, to enhance this performance, it is necessary to overcome the trade barriers.

The foreign trade barriers, commonly known as trade barriers refer to rules, procedures and other measures aimed at hindering or restricting trade between countries, and are often used for protectionist purposes of the domestic industry. Other types and details about trade barriers are explored in the theoretical framework.

As if all these obstacles were not enough, Brazil still gets another highlight in this scenario, with its famous logistics constraints, among which, according to the opinion of several authors in the area (which will be shown in the theoretical framework) can be highlighted: the bad Brazilian transportation matrix in which prevails road transport; the many problems of logistics infrastructure and road access to the port; excessive bureaucracy; a high tax burden, among other constraints that "strangle" any kind of logistical planning.

## **PROBLEM RESEARCHED AND GOALS OF THE STUDY**

The examples mentioned here have shown that the Brazilian logistics barriers of foreign trade are many. However, with the Brazilian potential for innovation, production capacity, the

natural resource available and an administration based on a good planning, it's possible to believe in improvements.

However, in order to achieve a good administration, it is necessary to know exactly the points that need to be improved and to know what needs to be done, one needs three things: 1) to know the factors that most influence on logistics performance; 2) to measure the Brazilian performance because as Drucker (1998) said, "One does not manage what is not measured", and; 3) to conduct a benchmarking comparing the national to the international performance in order to adopt the best global practices.

To achieve these goals, this article was based on a renowned international study that brings up a dense comparative report between the logistics performance of 160 countries, the LPI: Logistic Performance Index, which analyzes six different aspects that influence the logistics performance of different countries. These six indicators are based on two main important categories. They are:

- **Policy Regulation Areas**, indicating key inputs to the supply chain, containing three indicators: Customs Performance (the efficiency of custom clearance), National Infrastructure Quality and Internal Logistics Service Quality
- **Delivery Performance Results**, being the other three indicators: Punctuality of operations, Competitiveness of Prices for International Shipments, and Ease of Tracking and Tracing.

A grade is assigned to each of these indicators and to establish the final result the World Bank uses standard statistical techniques to aggregate the data in a single indicator.

According to Jeffrey Lewis, director of Economic Policy and Debt Trade Department of the World Bank, "LPI is a concrete tool to raise awareness and to stimulate improvements. This allows us to evaluate restrictions through a wide range of countries."

To have an idea of the Brazilian performance, according to the 2014 LPI report, among 160 countries, Brazil occupied the 65th place in the overall performance, behind, for example, countries like El Salvador, Serbia, Oman and Vietnam. In a separate indicator result, Brazil's best result was 50th in the internal logistics service quality indicator and the worst and most embarrassing result was the efficiency indicator of customs clearance, in which Brazil was in 94th place!

Based on the disturbing results of this report, this study will address the theoretical framework to the main obstacles that affect the logistics performance, bringing up the most important data of this report and performing an analysis and a discussion of the Brazilian performance when compared to other countries with superior performance to try to raise attention to the society and especially to the political authorities to areas in need of emergency planning and improvement, to try to optimize the Brazilian performance improving the country's position in a future report.

## THEORETICAL FRAME OF REFERENCE

Since Brazil occupied such position on the 2014 LPI, there is a need to identify all the indicators presented in the report and to study the factors that may represent barriers and / or logistical constraints in operations of foreign trade.

The LPI report is a study made by the World Bank Group (WBG) since 2007 and the group has tried to issue the LPI every two years. In 2007, the study was conducted with 150 countries

and in 2010 and 2012 the study was done with 155, however, on the last report (2014) the group managed to add another 5 reaching 160 countries.

The data that make up the 2014 study, conducted by the Group Unit of International Trade, come from a structured online survey answered by over 1,000 logistics professionals engaged in international freight forwarding, the so called freight forwarder companies.

The World Bank believes that these professionals are more suitable to assess how countries are performing the studied indicators and their opinions are reliable as they directly affect the choice of shipping routes and access, influencing, therefore, the companies and countries' decisions as the place of production, choice of suppliers and selection of target markets.

The LPI is being increasingly respected and used by the political authorities. In Indonesia, for example, the index is formally used to measure the performance of the Ministry of Commerce. The organization of Asia-Pacific Economic Cooperation (APEC) uses the LPI to measure the impact of an initiative to improve connectivity in the supply chain. The European Commission has used the IPL in its Transport Evaluation Panel and its performance evaluation of the Customs Union.

The IPI consists of 6 indicators that were previously handled in two broad categories (Policy Regulation Areas and Delivery Performance Results), which can be considered the critical success factors for logistics performance, however, to simplify the representation of these indicators, the following classifications will be adopted, with the criteria measured to be analyzed in brackets:

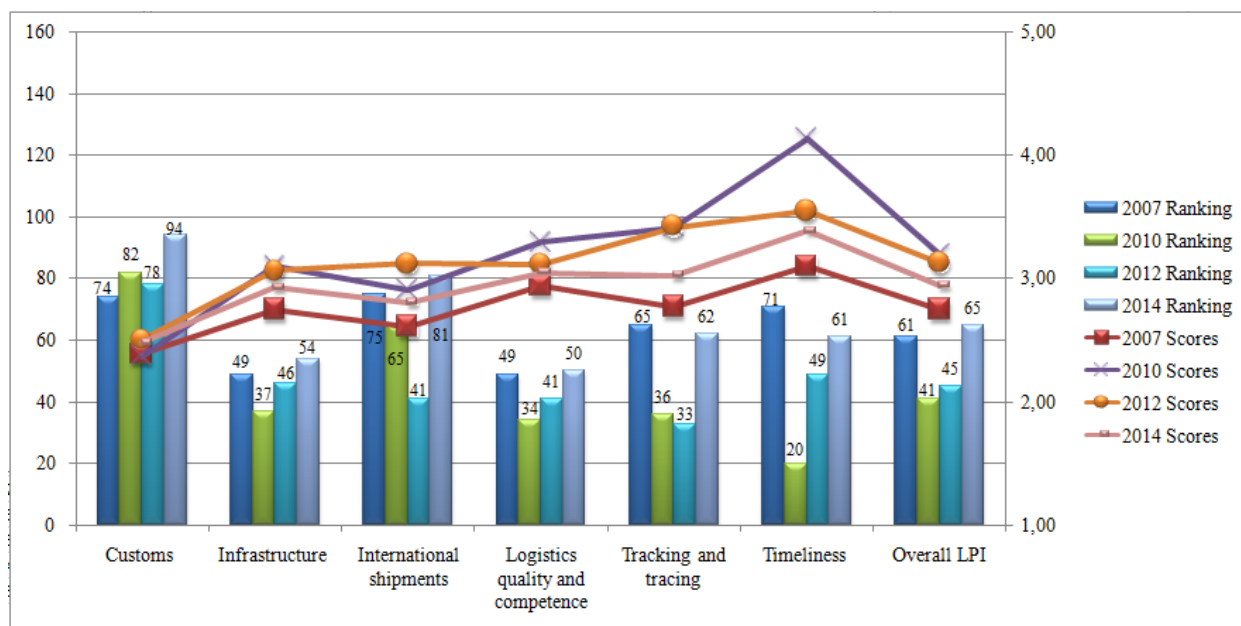
- Customs (Efficiency)
- Infrastructure (Quality)
- International shipments (Prices)
- Logistics quality and competence (Quality)
- Tracking and tracing (Facility)
- Timeliness (Deadlines)

To set the logistics performance index each indicator is evaluated and a grade is assigned to it, which may varies within a range from 1 to 5, being 5 the best score.

Among all countries, Germany has been the country with the best performance, with a score of 4.12 on the LPI, and Somalia the worst one with 1.77.

Germany was also the country that kept the best performance from 2007 to 2014 and Brazil, on the last report, got 2.94 points, which was its worst position since 2007 (65° place) in Logistics Performance.

The graphs demonstrated on the following figure represent the 2007 to 2014 reports:



*Figure 1 - Graphs with the Brazilian logistics performance from 2007 to 2014.  
Source: Authors based on the LPI report*

These graphs show that, despite the indicators have suffered a slight improvement over the past seven years, its position in the world ranking dropped, especially regarding the efficiency of customs clearance, which dropped by 20 positions.

The disparity between the best and worst countries in trade logistics is still quite large, despite a slow evolution perceived since 2007.

According to the World Bank, despite the almost worldwide recognition that the low efficiency of the supply chain is the main barrier to trade integration in the modern world, that gap persists due to the complexity of logistics reforms and investment in developing countries.

Supply Chain also involves all steps taken by the raw material to reach the final consumer as a finished product. In this context it is transformed or new materials are added to modify or add value along its route. And today, the supply chain has no borders, at many times its management complexity increases because each bond of the process is located in a different country, which demands an even more efficient performance. Most of this complexity is linked to trade barriers, costs and customs procedures that must be fulfilled for a company to be able to export or import the products of which it needs. These procedures depend on a large bureaucracy.

Regarding the barriers, according to the Ministry of Development, Industry and Foreign Trade, although there is no precise definition for trade barrier, this can be understood as any law, regulation, policy, measure or governmental practice that imposes restrictions on foreign trade.

This Ministry warns: "the systematic and updated identification of barriers for each export market is essential so that measures can be taken in order to prevent foreign trade barriers." Therefore, we see the need for constant updating of foreign trade professional.

Apart from these, there are also natural barriers inherent to foreign trade, which are faced by any country that predisposes to conduct international business transactions, such as: the cultural shock, that can compromise a negotiation; language, religion, etc.

The two most common categories of trade barriers are: the Tariff Barriers: the one that deals with import tariffs, miscellaneous fees and customs valuation, and; Non-Tariff Barriers: dealing with quantitative restrictions (quotas), import licensing, customs procedures, Antidumping

Measures, Countervailing Measures, Subsidies, Safeguards, Sanitary and Phytosanitary Measures and Technical Barriers, which can be mechanisms used for protectionist purposes, but the emphasis given by this article is on customs procedures in order to achieve the proposed objectives.

The costs, as mentioned earlier, are also a major concern in the index, when talking about tariff barriers, for example, when it comes to tax burden, a study made in 2013 by the BIPT (Brazilian Institute of Planning and Taxation) stated that Brazil alone has almost double of the average tax burden of other countries that are part of the BRICS (group composed of Brazil, Russia, India, China and South Africa, classified as emerging market because of its developing growing economic potential).

According to the president of the Superior Council, a tax expert and BIPT studies coordinator, Gilberto Luiz do Amaral, the constant increases of the Brazilian tax burden make it very clear the difficulty that Brazil has to extend its foreign trade and also to encourage domestic production. According to him "Competing in a globalized world with such a high tax burden is the same as putting a sumo wrestler to compete in the 100-meter dash in the Olympics".

Novaes (2001, p. 65) warns the need to give more attention to this issue by emphasizing that "The modern supply chain management is concerned not only with the streamlining of the process as well as the reduction [and good administration] of overall costs".

In this sense, Lopez and Gamma (2010, p 400) state that there is an incidence of various taxes in the pricing of Brazilian products, whose impact is much greater than the one observed in the cost of international competitors caused by the policy and macroeconomic structure of a country.

The Brazilian infrastructure is one of the indicators evaluated by the LPI that much influence on the final logistics costs and, in many cases, its disabilities create logistical constraints that can further increase these costs.

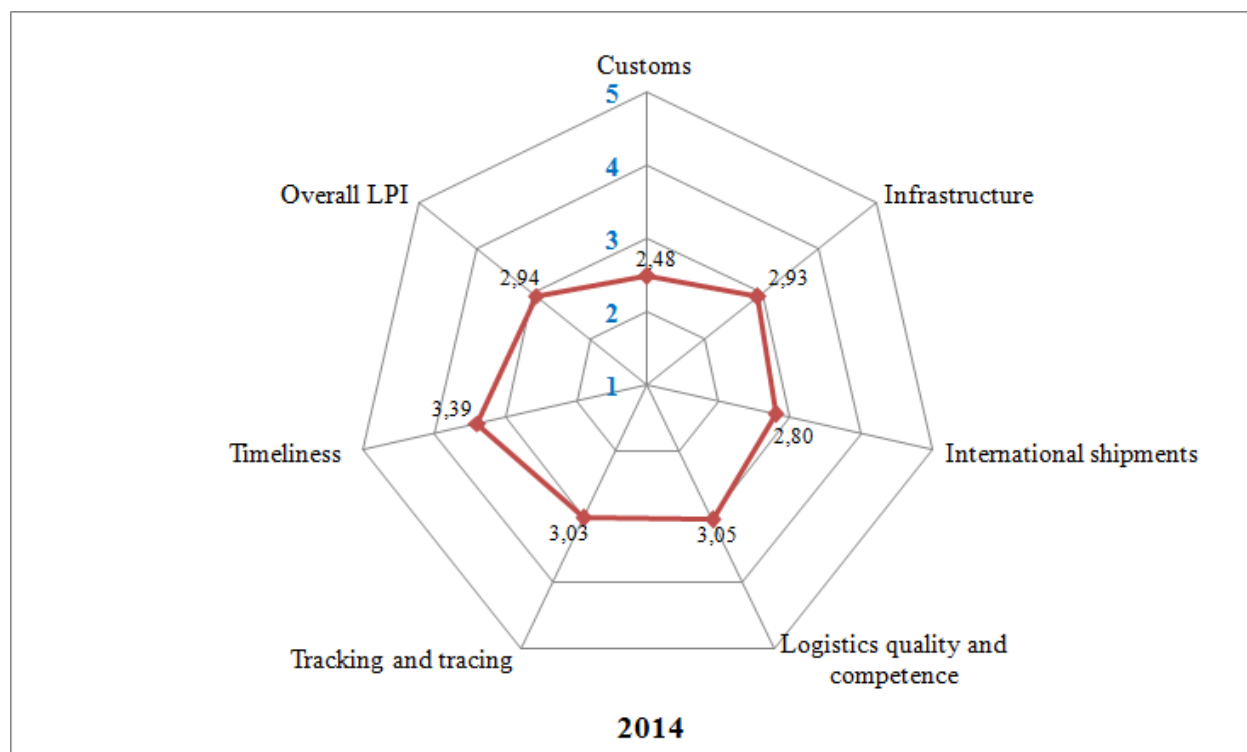
To have a preview of the situation, when it comes to the Brazilian transportation matrix, Keedi (2012) states that Brazil is a country based on road transportation, however, it only has 1.5 million kilometers of roads, of which only about 170,000 are asphalted. The United States, according to statistics, has more than 6 million km of roads, with at least 70% of them asphalted.

This shows how much Brazil still has to improve to minimize the cost of its transport and the fact that there's a substantially concentrated use in road transportation, it causes congestion and delays in the flow of cargo mainly at the nearby areas of ports, airports and borders due to the intensive use of roads and highways across the country.

Referring to the bureaucracy related to customs procedures needed to release a freight, among other factors that differentiate national trade operations from the international one, Bowersox, Closs, and Cooper (2006) state that "to meet the laws and regulations of all government entities, the required documentation for international business transactions is significantly more complex". Therefore, it can be deduced that this complexity is one of the factors that may be the cause of a major delay in the freight release.

Bizelli (2006) endorses this statement when he emphasizes that: "Since Import operations are transactions with companies in other countries, they involve special interest for the control and the intervention of government agencies beyond those that normally exist for the monitoring of operations, buying and selling domestic markets, which is why they are very systematic themselves"

The radar graph pictured in the figure below shows the punctuation achieved by Brazil in each of the indicators analyzed by the Logistic Performance Index of the World Bank (LPI):



*Figure 2 – Brazilian graph performance of each indicator in 2014.*

*Source: Authors based on the LPI report*

It can be seen in this graph that the worst Brazilian punctuation was precisely at the efficiency indicator in customs clearance, which emphasizes the latent need for improvement of these procedures.

In this regard, in January 2014, the World Trade Organization (WTO) completed a "facilitation trade agreement", which establishes norms for customs procedures so they become faster, more efficient and this agreement contains provisions relating to technical assistance and training in this area. The World Bank and six other multilateral financial institutions supported the WTO efforts in a unified statement in October. This agreement established by the WTO pressured customs procedures to be simplified and streamlined and Brazil has gradually taken steps to meet this international order and has been launching programs and bureaucratic procedures updates to try to achieve the established goals.

## METHOD

The method used in this study was the bibliographical research by consulting the collections of libraries; consultation of magazines and professional journals, scientific papers, monographs relating to the subject, and book published by specialized agencies in Logistics and Foreign Trade. Another very important and guiding research sources to this article are the studies and reports prepared by the World Bank (World Bank) that perform depth research on the logistics performance of different countries and synthesize this information in a comparative report which is of great value to be analyzed by professional and regulatory agencies in the area.

The literature contributes to this study since it allows one to explore the analysis and point of view of several authors and brings greater theoretical background and they enrich the arguments dealt with the views of authors who are experienced and specialized professionals both nationally and internationally.

## **RESULT ANALYSIS**

At the 2014 LPI report, Germany has demonstrated the best overall logistics performance of the world. Somalia had the lowest score. And as in the previous editions, the study found that countries with high income dominate the top of world rankings. Among the low-income countries, Malawi, Kenya and Rwanda had the highest performance. In general, the trend in all previous reports was that, in general, countries are improving their performance, and countries with poor performances are increasing their overall scores faster than countries with high performances.

According to the study, the low, middle and high-income countries should adopt different strategies to improve their positions in logistics performance. Interestingly, in low-income countries, the biggest gains typically come from improvements in basic infrastructure and border management. This may mean a simple customs reform, but, increasingly, this means improving efficiency in other organizations present at the border, including those responsible for sanitary and phytosanitary controls. Therefore, very often, several different approaches are necessary.

The middle-income countries, in general, have identified major improvement gains at logistics services when some specialized functions were outsourced, such as transportation, freight forwarding, and storage, according to the LPI.

An interesting fact is that according to the study, in high-income countries, there is a growing awareness and a growing demand for the so-called "green logistics" or logistics services that are environmentally sustainable. In 2014, approximately 37% of those surveyed by the LPI (the ones that shipped cargo to the OECD countries - Organization for Economic Cooperation and Development) recognized a demand for environmentally sustainable logistics solutions, compared to only 10% of the shipments destined to low-income destinations.

As seen so far, all studied indicators are related to each other and most of the time one's inefficiency causes inefficiency to another indicator, increasing the costs and making the country lose in competitiveness.

According to the LPI (2014) report, in recent years, with prices falling globally, logistics and other aspects of trade facilitation receive a certain pressure to reduce the costs of trade. A 2013 study by the World Bank Group and the World Economic Forum found that reducing the high transaction costs and unnecessary bureaucracy faced by traders could provide a significant boost to the global GDP.

This is the overview of the Brazilian performance on the world stage, where it became clear that the main factors that hinder our performance, according to the LPI 2014 the factors that are hindering Brazil are customs clearance procedures and the low competitiveness of our prices in International Shipments which are affected by very high tax burden.

However, as stated previously, it is believed that the country has the potential to minimize its logistics costs through optimization of best operational and management procedures which are already being applied at other countries, including those of low and middle income, and can be



copied by Brazil in order to improve its performance and its representativeness of foreign trade in the world scenario.

## CONCLUSION

This article seeks to analyze the performance of the Brazilian foreign trade logistics in the world and to identify the most critical barriers that hinder Brazilian competitiveness. It was observed that the Brazilian performance is reaching an average score in the world ranking, but below countries with fewer resources and potential. Barriers that have proved most critical for this result, among the six indicators analyzed by the LPI were the inefficient customs clearance procedures and the low competitiveness of our prices in relation to international shipments. These results outline an overview of Brazil's performance on the world stage and highlight the main points to be improved.

"LPI has been trying to portray a complex reality that are the attributes of the supply chain," said Jean-Francois Arvis, Senior Economist Transport and founder of LPI project. "In countries with high logistics costs, it is often not the distance between trading partners, but the reliability of the supply chain that is the most important contributor to these costs. And Brazil is not demonstrating this reliability since it cannot be competitive enough in the world scenario.

During this research, it can be seen that the Brazilian bureaucracy has been shown to be a critical factor that is generator and booster to the logistics constraints and it also make Brazil lose international competitiveness internationally and reflecting very little in volume of world trade.

According to the LPI, inefficient logistics increases trading costs and reduces the overall integration potential and this is a heavy burden on developing countries that are trying to compete in the global market. It's clear then that the Brazilian policy need to direct greater attention to programs, projects and actions to improve logistics efficiency.

This article hopes to serve as a basis for future studies that will permit a more comprehensive analysis of each of the indicators studied, compared to studies of other national and international institutions if possible, in order to portray the current situation and the measures that are or could have being taken to improve the Brazilian logistics performance.

## BIBLIOGRAPHY

- Bizelli, João dos Santos. 2006. *Importação: sistemática administrativa, cambial e fiscal*. São Paulo: Aduaneiras.
- Bowersox, Donald J., Closs, David J. e Cooper, M. Bixby. 2006. *Gestão Logística de Cadeias de Suprimentos*. Editora Bookman.
- Chase, Richard B.; Aquilano, Nicholas J. 1995. *Gestão da produção e das operações: perspectiva do ciclo de vida*. Lisboa: Monitor.
- Coelho, Leandro Callegari. 2011. *Brasil melhora em ranking de desempenho logístico*. Available at: <<http://www.logisticadescomplicada.com/brasil-melhora-em-ranking-de-desempenho-logistico/>>. (Accessed May 1, 2011).
- Drucker, Peter F. 1998. *Introdução à Administração*. 3ª ed. São Paulo: Pioneira,
- IBPT – Instituto Brasileiro de Planejamento e Tributação. Gilberto Luiz do Amaral. 2013. *Carga tributária brasileira é quase o dobro da média dos BRICS*. Estudo publicado em 2013. Available at: <<https://www.ibpt.org.br/noticia/1443/Carga-tributaria-brasileira-e-quase-o-dobro-da-media-dos-BRICS>> Acesso em: 04 out. 2014 (Accessed October 4, 2014).

- Keedi, Samir. 2014. *Logística, transportes e futuro*. Revista Sem Fronteiras. 470ª ed. Available at: <<http://www.aduaneiras.com.br/noticias/semfronteiras/default.asp?m=2&artigoid=4734>> (accessed December 12, 2014).
- Lopez, José Manoel Cortiñas; Gama, Marilza. 2010. *Comércio Exterior Competitivo*. 4 ed. São Paulo: Aduaneiras
- LPI – *Logistic Performance Index*. 2014. World Bank Group. Available at: <<http://lpi.worldbank.org/report>> (accessed September 25, 2014).
- MDIC – Ministério do Desenvolvimento, Indústria e Comércio Exterior. 2015. *Importação*. Available at: <<http://www.mdic.gov.br/sitio/interna/interna.php?area=5&menu=246>>. (Accessed May 7, 2015).
- Novaes, Antonio Galvão. 2001. *A. Logística e Gerenciamento da Cadeia de Distribuição*. Rio de Janeiro: Campus
- Pires, Sílvio R. I. 2007. *Gestão da Cadeia de Suprimentos: (Supply Chain Management) - Conceitos, Estratégias, Práticas e Casos*. 1ª ed. 3ª reimpressão. São Paulo: Atlas.
- Sousa Junior, J. N. C. 2010. *Avaliação da eficiência dos portos utilizando análise envoltória de dados: estudo de caso dos portos da região nordeste do Brasil*. Fortaleza, 2010. Dissertação (Mestrado. Programa de Mestrado em Engenharia de Transportes) – Universidade Federal do Ceará, Fortaleza, CE
- Souza, F.A.F. 2002. *Elaboração de um Modelo de Localização de Cargas Unitizadas Agroindustriais em Pátios Portuários: Aplicação ao Caso do Terminal Portuário do Pecém*. 2002. Dissertação (Mestrado em Engenharia de Transportes) – Universidade Federal do Ceará, Fortaleza, CE