International Trade between Colombia and Asia in the Framework of Logistics Processes: A Bibliometric Review

William NIEBLES-NUNEZ[1], Javier RAMIREZ[2], Jhony GARCIA-TIRADO[3]

Abstract

Purpose: This report aimed to review the literature on the research topic "Imports and exports between Colombia and Asian countries in the framework of logistics processes in international trade" of the last ten years. **Research design, data and methodology:** Documents indexed in the Web of Science metasearch engine were used as a source of information. The 500 most relevant downloaded in bibTex format were worked on and their processing was carried out using the statistical software Excel and R, through the Bibliometrix package. **Results:** The results indicate that the country that makes the most contributions to the research area is the United States (274), the author that publishes the most is Bahmani-Oskooee M., with (11) research, 424 of the documents found are journal articles, and the institution that contributes the most in this area is the University of Wisconsin. **Conclusions:** It is concluded that scientific production within the framework of international trade between Asia and Colombia has had a notable increase, which can be explained by the opening of both continents as strategic allies and the new vision of logistics processes taking advantage of the strategic location of countries within the Pacific Ocean.

Keywords: Import, Export, Colombia, Asia, Logistics.

JEL Classification Code: B27, F14, R12.

1. Introduction

The current context of globalization and the new industrial revolution has allowed the maximization of the processes of exchange of goods and services between nations (Lacka et al., 2020); where through a management process on a website it is possible to acquire products from one part of the world to the other, being able to choose between competitors that can offer the best value for money and varying between the geographical location and the terms related to the process of export and import (Hang & Adjouro, 2021). International trade is becoming more and more

dynamic thanks to the improvement of logistics processes in the various countries, from the plants of origin to going through the export and import processes to their distribution in collection centres in the receiving countries of said products (Giuffrida et al., 2019).

Certainly, international trade has become the key axis for the economic development of countries; being able to compete and offer their products and services to all parts of the world (Kollie, 2022). Concerning the case of Latin American countries, it is important to highlight how their geographical location is extremely strategic when carrying out trade processes with countries in North America, Asia,

1 First Author. Researcher, School of Economics, Universidad de Sucre, Colombia. Email: william.niebles@unisucre.edu.co
2 Second Author. Researcher, School of Economic, Corporación Universitaria Latinoamericana, Colombia, Email: jramirez07papers@gmail.com
3 Third Author. Rectory, Corporación Universitaria Taller Cinco, Colombia, Email: jgarciat@taller5.edu.co

or Europe; with whom they have historically developed important trade alliances to enhance the exchange of goods and services between nations (Quevedo et al., 2020).

In this sense, commercial transactions and alliances between Asia and Latin America have been greatly strengthened in the recent years; where companies from the Asian continent see a great opportunity to export their products and services to South America, which in a cost-benefit relationship and open trade policies become profits for both parties (Cáceres, 2022).

Within this scenario, it is notoriously the case of Colombia as a Nation of the Latin American continent which has a highly strategic access to the Pacific Ocean and the Caribbean Sea and a proximity to the Panama Canal (Bobadilla & Venegas, 2018); which allows it to position itself as an important ally in the framework of international trade due to the ability to interact and be part of the most relevant routes in the global context. As mentioned, this strategic location of Colombia, having borders with the Pacific Ocean and the Caribbean Sea, makes it visible as an important potential in the optimization of international trade logistics processes, this allows considerable costs to be reduced in cargo transportation through ports located on the border with said bodies of water (Torres, 2021).

The integrated trade through ports as strategic distribution points shows that by 2019 demonstrated that 80% of world merchandise was mobilized by maritime means and reached a total of 1,980 million deadweight tons (Becerril-Torres et al., 2021). With this, it is remarkable how within the pandemic there has been a significant decrease, which to date has been addressed to overcome this situation and seeking to potentiate the various channels such as the Pacific Ocean in this process (Bórquez, 2022).

Thus, several research shows a growth in relevance of trade relations between Colombia and Asian countries such as China, Japan, or South Korea (Bernal et al., 2019; Torres, 2021). This growth can also be evidenced in the academic production, which allows establishing a better understanding of this phenomenon under study, to identify the best alternatives and conditions for the optimization of trade processes between Colombia and Asia.

In this sense, the constant process of learning and creation of new scientific knowledge regarding the process of international trade is necessarily embodied in the form of published products such as scientific articles, short articles, book chapters, among others (Capobianco et al., 2019; Lacka et al., 2020). This information is fundamental for research centres, universities, and States, who would make use of this knowledge based on science for its application in the resolution of problems and the implementation of new processes and policies aligned with international trade in the current era.

Based on this important relevance of studying and understanding the phenomena under study from the scientific production, the objective of the research aimed to review the literature on the research topic "Imports and exports between Colombia and Asian countries" of the last ten years is presented.

Thus, this study presents the application of various quantitative processes based on bibliometric foundations to understand the trends and characteristics of scientific production related to international trade between Colombia and the Asian continent in the framework of logistics processes in international trade in the range from 2011 to 2022.

2. Literature Review

2.1. Bibliometrics

First, it is essential to understand that bibliometrics can be explained as the science responsible for the study of science itself in the form of its products of new knowledge such as scientific publications (Dorta-Contreras, 2018). This branch of science emerges from the 20th century with authors such as Price (1986) who applied a variety of quantitative tools to describe and understand the behavior and characteristics of scientific knowledge (MasIc, 2021).

The importance of the use of bibliometrics in the field of scientific production is currently fundamental, from the quantification of publications in a specific field to knowing more complex elements such as the collaboration networks that exist between different authors and scientific productions as well as the classification of means of dissemination of high-level scientific literature and the recognition of the scientific impact of publications and their writers (Donthu et al., 2021; Flores-Fernández & Aguilera-Eguia, 2019).

Some of the most recognized types of bibliometric indicators are impacted indicators, consumption indicators, scientific activity indicators, circulation indicators, among others (Merediz-Solà & Bariviera, 2019; Mejia et al., 2021). After many uses, these indicators allow the recognition of scientific knowledge on a specific topic, often in response to the needs and concerns of society about these phenomena (Tomás-Górriz & Tomás-Casterá, 2018). Thus, bibliometrics have a variety of laws which allows the explanation and understanding of various behaviors that occur within the production of scientific publications in the world. Among some of the most prominent and those that will be analyzed in this article are Lotka's Law and Bradford's Law (Figueiredo et al., 2019).

Lotka's law explains that the greater the number of publications, the quantity of authors present in the published documents will be lower. This law allows knowing the

contribution made by scientists in proportion to the number of publications in a specific field of knowledge (Murugan et al., 2019; Nattar, 2019). Also, Bradford's law or the law of dispersion of scientific literature refers to the decrease in the performance of the search for information as the number of sources consulted increases (Alves, 2019).

2.2. Colombian Ports and Their Impact on Logistics in International Trade

For countries such as Colombia, the use of ports is the key tool for competitiveness in commercial processes within the framework of international trade, which as mentioned before there are several nations and groups that serve as strategic allies in this process (Cantillo et al., 2018). Research that has already been reviewed allows understanding how trade growth is described thanks to the optimal use of the Pacific Ocean and the Caribbean Sea, highlighting how the Pacific Alliance is becoming more relevant nowadays (Vega et al., 2019).

Based on this, according to Bobadilla and Venegas (2018) it should be understood that Colombia has four important port cities, which receive these goods depending on the country of origin due to the number of days in maritime travel, which significantly affect the decision-making in the distribution, these ports are a) Port of Cartagena: The main port of Colombia and the Colombian Caribbean is the port of Cartagena, and is also the fourth in Latin America, b) Port of Buenaventura: The second most important port of Colombia, and the main port in the Colombian Pacific, is the port of Buenaventura. It is ranked 12th in Latin America; c) Port of Barranquilla: Located on the Caribbean coast in northern Colombia, with the characteristic of having its docks located on the Magdalena River and d) Port of Santa Marta: Located on the Caribbean coast in northern Colombia, it is a deep-water port and one of its characteristics is to offer a low humidity climate. The ports mentioned above are shown in the following figure:

Source: Own Elaboration (2022)
Figure 1: Ports of Colombia

According to reports by ANALDEX cited by Barajas and Méndez (2021), the following percentages of mobilized tons are observed according to port areas:
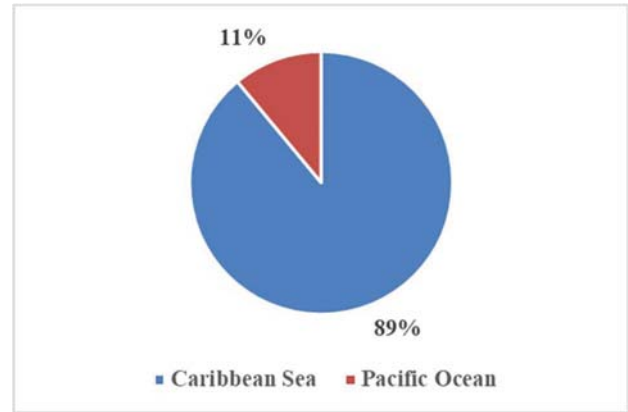
Source: Own Elaboration (2022)
Figure 2: Ports of Colombia

In this way, once the various outstanding elements related to the commercial processes between Asia and Colombia have been analyzed from the perspective of logistics processes, the following most significant points of the previous studies related to the subject are found:

Table 1: Main Information Theoretical Background

Authors	Study Contribution
Barajas & Méndez (2021)	An analysis of the agricultural market in municipalities of Colombia towards the export process is presented.
Bobadilla & Venegas (2018)	They make an analysis of the most important seaports in Colombia and how they affect the processes of commercial exchange.
Cantillo, Cantillo & Arellana (2018)	It proposes a model directed towards the process of choosing ports and countries for import export.
Cáceres (2022)	The cited research focuses on the analysis of the Latin American strip and route towards the strengthening of commercial processes between the continent and China.
Bernal, Strobel & Praj (2019)	They proposed an analysis of the new scenario for Latin America in the face of the commercial and geopolitical opportunities of the Pacific Ocean, concluding that this State with respect to others has competitive weaknesses.
Torres (2021)	It proposes an analysis of the weaknesses of Colombia in the use of the Pacific Ocean as a competitive element in the import process with Asia.
Vega, Cantillo & Arellana (2019)	Performs a quantitative analysis for the choice of a port based on official records of imports and exports.

Note: Own Elaboration (2022)

3. Research Methods and Materials

A systematic search of the literature was carried out in high-impact journals, such as those that are part of the Web of Science metasearch engine this year. Information retrieval strategies of great importance were used to achieve the main objective of the bibliometric analysis in this research topic, which, according to (Cruz & Javela, 2004), "... allow the analysis of quantitative aspects in order to evaluate different scientific products and fields of knowledge". These constitute a key tool to highlight and consolidate information on objectives, theories, concepts, and methods that guide the work of the disciplines in the different study topics.

They also serve to indicate the achievements of a certain field of knowledge, as well as provide indicators that allow establishing the degree of development of scientific disciplines and the level of contribution to knowledge of the human being. The analysis of the literature using the Web of Science metasearch engine yielded 117,080 documents. Then, these were filtered by the English and Spanish languages, leaving 113,533 research papers, then filtered by the areas of knowledge related to the subject of study, including economics, administration, business, and industrial engineering, which reduced the results to 17,313.

Finally, the biometric study was applied to the 500 most relevant documents that by default can be exported in bibTex format, using the "Full record and cited references" option of the Web of Science database. The search equation and filters used to obtain the results mentioned above were as follows:

- Import (topic) OR imports (topic) OR export (topic) OR exports (topic) AND Colombia (topic) AND Asian (topic).
- Refined by: Languages: English OR Spanish. Categories: Economics OR Business OR Management OR Industrial Engineering

4. Results and Discussion

The results of the search performed in the Web of Science database show the following findings:

Table 2: Main Information

Description	Results
Main information about data	
Timespan	2011:2022
Sources (Journals, Books, etc)	233
Documents	500
Average years from publication	5.15
Average citations per documents	8.34
Average citations per year per doc	1.23
References	13029

Document types	
article	424
article; book chapter	30
article; early access	17
article; proceedings paper	6
correction	1
editorial material	1
editorial material; book chapter	1
proceedings paper	17
review	3
Document contents	
Keywords Plus (ID)	695
Authors Keywords (DE)	1303
Authors	969
Authors	
Author Appearances	1111
Authors of single-authored documents	118
Authors of multi-authored documents	851
Author's collaboration	132
Single-authored documents	
Documents per Author	0.52
Authors per Document	1.94
Co-Authors per Documents	2.22
Collaboration Index	2.31

Note: Own Elaboration (2022)

Table 1 shows the central information in detail, where the time span from 2011 to 2022 can be seen. In total, 500 documents were analyzed, of which we can highlight that 424 are articles and 30 book chapters.

4.1. Laws of Bibliometric Productivity and Sources

Lotka's Law coefficient estimation is shown below:

Table 3: Lotka's Law

N. Articles	N. Authors
1	874
2	74
3	11
4	4
5	2
6	2
7	1
11	1

Note: Own Elaboration (2022)

The articles analyzed in table 2 comply with Lotka's law. In the field of research on imports and exports between Colombia and Asian countries, a greater number of authors have the least number of contributions and are consolidated as the most productive. For this case, 90.19% of the authors analyzed have made only one contribution to the field of study, 7.63% two contributions and only 2.16% have

contributed at least three works. Although compliance with this law can be observed, it can be concluded that this area of research is characterized by many transient researchers (97.82% with two contributions at most). On the application of Bradford's law, the following is observed:
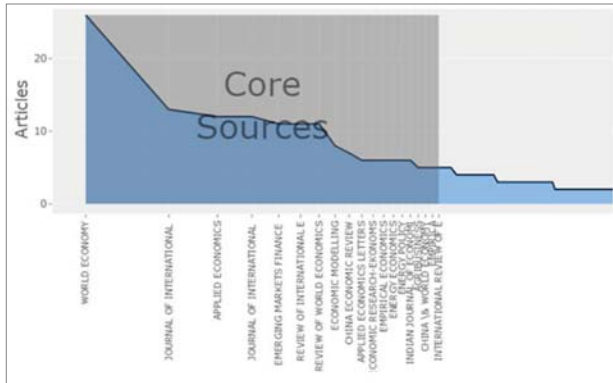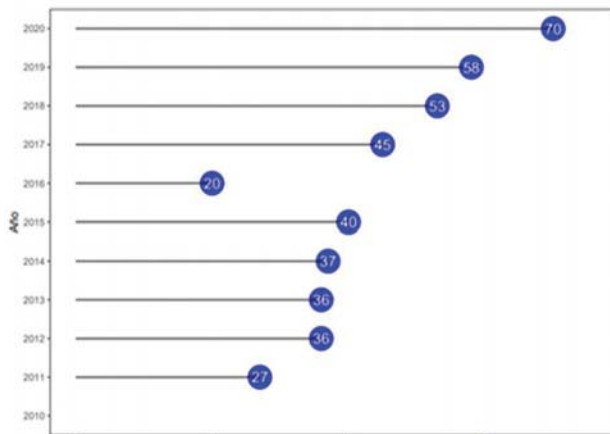

Source: Own Elaboration (2022)

Figure 3: Bradford's Law

Observing Figure 3, it can be said that, according to this law, 50.89% of the articles published are gathered in the first 6 journals observed, which are: World economy, Journal of international economics, Applied economics, Journal of international trade and economic development, Emerging markets finance and trade and Review of international economics. That is, the core of this area of knowledge would be formed by the sources mentioned above.

4.2. Bibliometric indicators

Source: Own Elaboration (2022)

Figure 4: Annual Scientific Production

Figure 4 shows that the annual scientific production has had a constant increase throughout the years of study, except

for 2016, where the number of publications was below the average (20 in total). On the other hand, the highest peak is observed in the year 2020 with 70 published documents. In general, it can be pointed out that there is an interest on the part of researchers, perhaps attracted by the current importance of the research topic, where there are still fields to be explored.
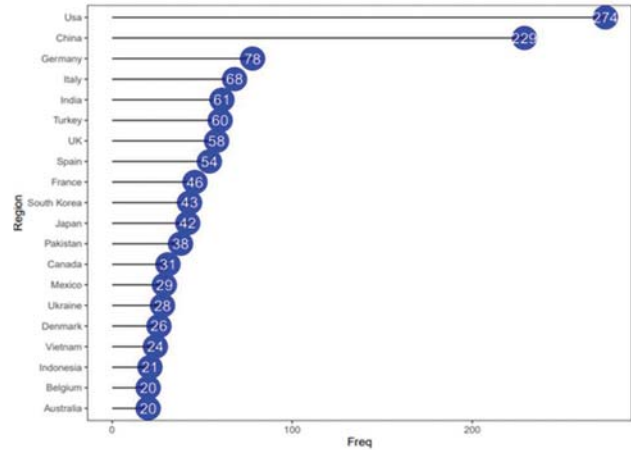
Source: Own Elaboration (2022)

Figure 5: Country production

In the analysis of this research work, an exploration of the geographical locations of the researchers was carried out with the aim of classifying the countries that contribute to the research topic. Figure 5 shows the twenty most productive countries, of which the United States, China, and Germany, with 274, 229 and 78 documents, respectively, are the most representative of this group.
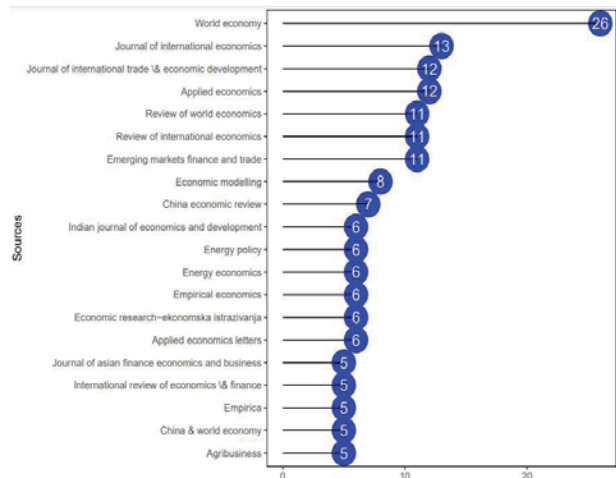
Source: Own Elaboration (2022)

Figure 6: Most Relevant Sources

On the other hand, from this analysis, it was possible to determine, observing figure 6, that the first four journals that publish the most in the research area are: World economy (26 contributions), Journal of international economics (13), Journal of international trade and economic development and Applied economics (12 each). The most representative publication of the magazine that contributes the most, examines how import processing time, which is one of the main obstacles in international trade, affects export patterns at the establishment level. Investigation of the effect of such time costs on export patterns reveals how smooth or slow operations at one stage affect all stages of an international production network (Hayakawa et al., 2019).
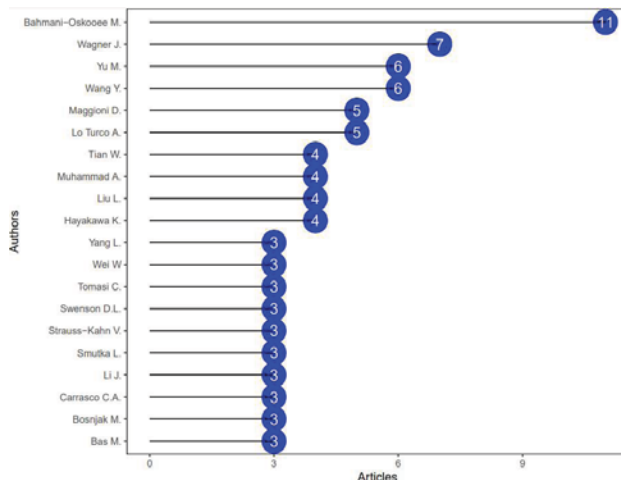
Source: Own Elaboration (2022)

Figure 7: Most Relevant Authors

The production at the author level is considered moderate in relation to the number of publications found in the research area. Figure 7 shows the contributions of the twenty most productive authors in the field and the first four of them are: Bahmani-Oskooee M. (11), Wagner J. (7), Yu M. (6) and Wang Y (6). The most cited article by the first author says that a country lives within its international budget constraint if its exports and imports are reintegrated.

Previous works to this research that had the intention of verifying the mutual integration between exports and imports used linear models and gave force to the theory in almost 50% of the selected countries. In this project, when we used the nonlinear ARDL approach and the asymmetric cointegration method, we confirmed the long-term relationship between imports and exports in 94 of the 100 countries that were part of our sample. This inquiry, in addition to being the most complete in the available literature, has also been the first to prove that trade flows follow a non-linear distribution (Arize & Bahmani-Oskooee, 2018).

Table 4: Most cited papers.

Paper	DOI	Total Citations
Wang Y., 2013, j comp econ	10.1016/j.jce.2012.12.004	235
Su B., 2013, energy policy	10.1016/j.enpol.2013.01.041	202
Sadorsky P., 2012, energy econ	10.1016/j.eneco.2011.12.008	182
Kasahara H., 2013, j int econ	10.1016/j.jinteco.2012.08.005	138
Fan H., 2015, rev econ stat	10.1162/REST_a_00524	130
Bas M., 2015, j int econ	10.1016/j.jinteco.2014.12.005	120
Bas M., 2014, rev world econ	10.1007/s10290-013-0175-0	90
Engel C., 2011, j int econ	10.1016/j.jinteco.2010.08.007	87
Haug A.A., 2019, energy econ	10.1016/j.eneco.2019.04.006	83
Bussiere M., 2013, am econ j -macroecon	10.1257/mac.5.3.118	79
Feng L, 2016, j int econ	10.1016/j.jinteco.2016.03.004	78
Dedeoglu D, 2013, energy policy	10.1016/j.enpol.2013.02.016	66
Muuls M., 2015, j int econ	10.1016/j.jinteco.2014.12.003	65
Cadot O, 2013, j econ surv	10.1111/j.1467-6419.2011.00719.x	58
Aristei D, 2013, rev world econ	10.1007/s10290-012-0137-y	54
Tang X., 2013, energy policy	10.1016/j.enpol.2013.02.009	52
Schroeder T.C., 2012, food policy	10.1016/j.foodpol.2011.10.005	45
Wagner J., 2013, rev world econ	10.1007/s10290-012-0141-2	40
Ramos S.B., 2013, energy econ	10.1016/j.eneco.2013.03.011	40
Rana R, 2019, J Int trade econ dev	10.1080/09638199.2018.1542451	40

Note: Own elaboration (2022)

Table 3 indicates that of the twenty publications that received the most citations, the three most representative is: Wang Yudong, 2013, Journal of Comparative Economic (205), Su B., 2013, Energy Policy (202) and Sadorsky P. 2012, Energy Economics (182). The most enunciated research in relation to the subject treated in the present work affirms that there is a correspondence between oil prices and stock markets that powerfully attract the attention of professionals in the economic and financial areas. Previous work does not establish any differentiation between oil-exporting and oil-importing countries when it comes to illustrating the consequences of oil price shocks on stock market performance. In this project, we attack this deficiency by resorting to a structural VAR analysis (Wang et al., 2013).
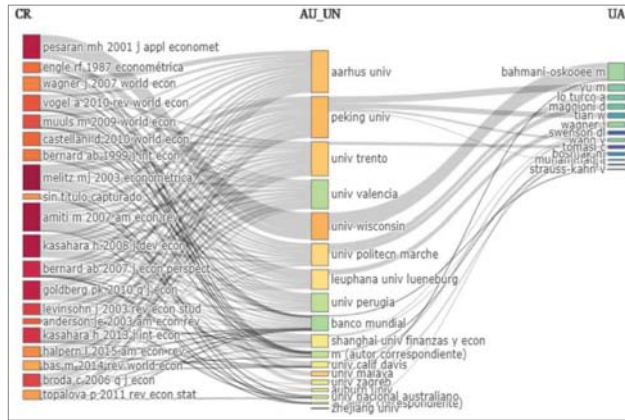
Source: Own Elaboration (2022)

Figure 8: Authors and Institutions

In figure 8, a high level of scientific production can be observed in certain academic institutions of higher education, such as the case of Aarhus University, Peking University, Trento University, Valencia University, and the University of Wisconsin, for example, mention the most representative of the field. Taking Peking University as an example, it is linked to the authors, Yu M, Tian W., Wang Y., and Li J. In turn, this same institution has referenced 13 documents, of which the three first are: Melitz M.J. (2003, Econometrics), Amiti M. (2007, American Economic Review) and Kasahara H. (2008, Journal Development Economic).

This last paper study the possibility that importing intermediate goods implies an increase in the performance of the plant. In parallel with the development of the topic related to simultaneous productivity shocks and the voluntary choice to import intermediate products, an estimation of the impact produced by the incursion of foreign intermediate products on the productivity of the plant is carried out through panel data for Chilean manufacturing at plant scale. Using multiple estimators, we are given conclusive evidence that the complete transition to importing foreign intermediate products does represent an increase in productivity. (Kasahara & Rodriguez, 2008).

5. Conclusions

5.1. Summary

From the five hundred most relevant documents reviewed in this bibliographical analysis, carried out in the Web of Science database on the research topic imports and exports between Colombia and Asian countries, the following can be concluded: 84.8% are journal articles, 6% are book chapters and the remaining 10% other formats. The

scientific production analyzed in the temporal space of the last 10 years shows a growing trend, except for the year 2016, in which 20 publications were registered.

The last three years were the most productive, indicating a great interest in the field of research. The United States, China, Germany, Italy, and India represent 46.48% of the twenty countries that publish the most in research. In the case of magazines, World economy, Journal of international economics, Applied economics, Journal of international trade and economic development and Emerging markets finance and trade, comprise 43.02% of the most productive sources. On the other hand, authors such as Bahmani-Oskooee M., Wagner J., Wang Y., and Yu M., are the four most representative with 34.88%.

Certainly, once the results of the study are obtained, it is possible to recognize an important growth of scientific productivity within this field, which could be aligned to the commercial rapprochement between the Latin American states, especially Colombia, with the markets of the Asian nations who have become strategic partners and key allies for the development of this nation; with an emphasis to the countries that are part of the Asia Pacific group that due to the fact of sharing connection through the Pacific Ocean have the ability to establish much more effective trade relations and at lower transportation costs.

Thus, from the logistical point of view, Colombia's strategic location between the Pacific and Atlantic Oceans allows the use of the four seaports for the entry of vessels not only for the distribution of products in the Colombian domestic market, but also to serve as a collection point for the distribution of goods to the entire Latin American continent.

In this way, the scientific production studied through the review process allows concluding that the themes and direction of these are inclined towards the processes of economic integration between the Pacific blocs and Colombia, as well as the adequate use of the distribution channels in the bodies of water for the most adequate interaction between the Latin American nation and the Asian continent.

At the same time, it can be concluded that Colombia is often identified as a country with great potential for the location of distribution centers throughout Latin America and the Caribbean, taking advantage of its potential from the point of view of international logistics.

5.2. Implications

It is important to recognize that the field of knowledge regarding the commercial context between Asian countries and Colombia is still young and with little deepening because many times it remains as part of a context in a global analysis on specific economic sectors, but it is expected that

with the deepening of the alliances and the positioning of the countries of the Asia Pacific block in the Latin American nation it will be possible to generate new studies that contribute to the recognition and understanding of this area of knowledge.

From the point of view of the implications of the study, it is important to mention that it is carried out at a key moment in the history of relations between the Pacific bloc and Colombia, since the current alliances and proximities at the state and commercial level will have a significant impact on the dynamics of trade between both actors in the future, based on the opportunities for optimizing logistics processes in Latin America and the Caribbean thanks to Colombia's geographical location.

Certainly, an important increase in the scientific production related to the subject of study is expected; at the same time, the generation of new studies under the descriptive premise carried out allows to deepen in a more effective way the generation of new knowledge on how Colombia becomes a key player in the distribution of products from the Asian continent for all Latin America and the Caribbean; at the same time, such synergy should be reciprocal in which Colombia can take advantage of these distribution channels for the development of its export activity.

It is important to highlight among the limitations of this study the current pandemic of COVID 19 because this not only represented a significant slowdown in international trade, especially maritime trade due to the so-called container crisis. This situation also had a direct effect on the scientific production related to these topics, so it is expected that while this situation can be overcome, there will be an increase in terms of scientific production related to the trade processes in the existing channels in the Asian continent and Colombia.

References

Alves, F. (2019). Exemplifying the Bradford's Law: an analysis of recent research (2014-2019) on capital structure. *Journal of Social Sciences in Perspective*, *18*(35), 92-101. https://doi.org/10.48075/revistacsp.v18i35.21801

Aristei, D., Castellani, D., & Franco, C. (2013). Firms' exporting and importing activities: is there a two-way relationship? *Review of World Economics*, *149*(1), 55-84. https://doi.org/10.1007/s10290-012-0137-y

Arize, A. & Bahmani, M. (2018). Do imports and exports adjust nonlinearly? Evidence from 100 countries. *Global Economy Journal*, *18*(1), 1-30. https://doi.org/10.1515/gej-2017-0094

Barajas, J. & Méndez, M. (2021). Traditional Farmers Producing for the Agricultural Export Market: Causes and Consequences of Said Productive Change. *Lasallian Journal of Research*, *18*(1), 65-83. https://doi.org/10.22507/rli.v18n1a5

Bas, M. & Strauss, V. (2014). Does importing more inputs raise exports? Firm-level evidence from France. *Review of World Economics*, *150*(2), 241-275. https://doi.org/10.1007/s10290-013-0175-0

Becerril, O., Munguía, G., & Nava, R. (2021). Effect of container movement on the efficiency of the main cargo operating economies of APEC. *Mexico and the Pacific Rim*, *10*(30), 141-168. https://doi.org/10.32870/mycp.v10i30.739

Bernal, G., Strobel, J. A. A., & Praj, D. P. (2019). Approaches to the new world scenario: Colombia on the Asia Pacific region. *Scenarios: company and territory*, *8*(11), 1-26. http://esumer.edu.co/revistas/index.php/escenarios/article/view/17

Bobadilla, J. & Venegas, A. (2018). The importance of ports within the economy in Colombia and its bordering countries. *Point of View*, *9*(13), 1-14. https://doi.org/10.15765/pdv.v9i13.1115

Bórquez, A. (2022). Trade Facilitation Under the Pacific Alliance Framework: Seaports Case. In *China's Trade Policy in Latin America*. Springer, Cham, 133-145. https://doi.org/10.1007/978-3-030-98664-3_9

Cáceres, J. (2022). Chinese Export Promotion Policies Toward Latin America: The Belt and Road Initiative. In *China's Trade Policy in Latin America*. Springer, Cham, 63-78. https://doi.org/10.1007/978-3-030-98664-3_5

Cadot, O., Carrère, C., & Strauss-Kahn, V. (2013). Trade diversification, income, and growth: what do we know? *Journal of Economic Surveys*, *27*(4), 790-812. https://doi.org/10.1111/j.1467-6419.2011.00719.x

Cantillo, J., Cantillo, V., & Arellana, J. (2018). Modelling with joint choice of ports and countries of origin and destination: application to Colombian ports. *Maritime Policy & Management*, *45*(6), 720-738. https://doi.org/10.1080/03088839.2018.1440090

Capobianco, M., Casado, M., Marín, G., & Terán, E. (2019). A bibliometric analysis of international competitiveness (1983–2017). *Sustainability*, *11*(7), 1877-1899. https://doi.org/10.3390/su11071877

Dedeoğlu, D. & Kaya, H. (2013). Energy use, exports, imports, and GDP: New evidence from the OECD countries. *Energy Policy*, *57*(1), 469-476. https://doi.org/10.1016/j.enpol.2013.02.016

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*(1), 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

Dorta, A. (2018). Science with measures. Bibliometric and scientometric studiesin a new section. *Havana Journal of Medical Sciences*, *17*(4), 508-509. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1729-519X2018000400508

Engel, C. & Wang, J. (2011). International trade in durable goods: Understanding volatility, cyclicality, and elasticities. *Journal of International Economics*, *83*(1), 37-52. https://doi.org/10.1016/j.jinteco.2010.08.007

Fan, H., Li, Y. A., & Yeaple, S. R. (2015). Trade liberalization, quality, and export prices. *Review of Economics and Statistics*, *97*(5), 1033-1051. https://doi.org/10.1162/REST_a_00524

Feng, L., Li, Z., & Swenson, D. L. (2016). The connection between imported intermediate inputs and exports: Evidence from Chinese firms. *Journal of International Economics*, *101*(1), 86-101. https://doi.org/10.1016/j.jinteco.2016.03.004

Figueiredo, R., Quelhas, O., Vieira, J., & Ferreira, J. J. (2019). The role of knowledge intensive business services in economic development: a bibliometric analysis from Bradford, Lotka and Zipf laws. *Management and Production*, *26*(4), 1-12. https://doi.org/10.1590/0104-530X4356-19

Flores, C. & Aguilera, R. (2019). Bibliometric indicators and their importance in clinical research. Why know them? *Journal of the Spanish pain society, 26*(5), 315-316. https://dx.doi.org/10.20986/resed.2018.3659/2018

Giuffrida, M., Mangiaracina, R., Perego, A., & Tumino, A. (2019). Cross-border B2C e-commerce to China: An evaluation of different logistics solutions under uncertainty. *International Journal of Physical Distribution & Logistics Management*, *50*(3), 355-378. https://doi.org/10.1108/IJPDLM-08-2018-0311

Hang, H. T. & Adjouro, T. (2021). The Effects of Cross-Border E-Commerce on International Trade and Economic Growth: A Case of China. *International Journal of Economics and Finance*, *13*(12), 82-89- https://doi.org/10.5539/ijef.v13n12p82

Haug, A. A. & Ucal, M. (2019). The role of trade and FDI for CO_2 emissions in Turkey: Nonlinear relationships. *Energy Economics*, *81*(1), 297-307. https://doi.org/10.1016/j.eneco.2019.04.006

Kasahara, H., & Rodrigue, J. (2008). Does the use of imported intermediates increase productivity? Plant-level evidence. *Journal of Development Economics*, *87*(1), 106-118. https://doi.org/10.1016/j.jdeveco.2007.12.008

Kasahara, H., & Lapham, B. (2013). Productivity and the decision to import and export: Theory and evidence. *Journal of International Economics*, *89*(2), 297-316. https://doi.org/10.1016/j.jinteco.2012.08.005

Kollie, G. B. (2022). International Trade, Economic Growth and Governance: Evidence from ECOWAS Member Countries. *African Journal of Economic Review*, *10*(3), 150-166. https://www.ajol.info/index.php/ajer/article/view/227067

Lacka, E., Chan, H. K., & Wang, X. (2020). Technological advancements and B2B international trade: A bibliometric analysis and review of industrial marketing research. *Industrial Marketing Management*, *88*(1), 1-11. https://doi.org/10.1016/j.indmarman.2020.04.007

MasIc, I. (2021). Bibliometric Indices and its Role for the Quality Assessment of the Author's Published Content in the Scientific Journals. *Int J Biomed Healthc*, *9*(4), 244-253. https://doi.org/10.5455/ijbh.2021.9.244-253

Mejia, C., Wu, M., Zhang, Y., & Kajikawa, Y. (2021). Exploring topics in bibliometric research through citation networks and semantic analysis. *Frontiers In Research Metrics and Analytics*, *6*(1), 1-16. https://doi.org/10.3389/frma.2021.742311

Merediz, I. & Bariviera, A. (2019). A bibliometric analysis of bitcoin scientific production. *Research in International Business and Finance*, *50*(1), 294-305. https://doi.org/10.1016/j.ribaf.2019.06.008

Martínez, S., López, D., & Ojeda, D. (2018). Comparative study of the ports of San Antonio and Buenaventura with a view to improving competitiveness: Case of Colombia. *Point of View*, *9*(14), 1-27. https://doi.org/10.15765/pdv.v9i14.1181

Murugan, M., Saravanakumar, R., & Thirumagal, A. (2019).

Lotka's law and pattern of author productivity of information literacy research output. *Library Philosophy and Practice*, *2509*(1), 1-18. https://core.ac.uk/download/pdf/215162173.pdf

Muûls, M. (2015). Exporters, importers and credit constraints. *Journal of International Economics*, *95*(2), 333-343. https://doi.org/10.1016/j.jinteco.2014.12.003

Nattar, S. (2019). Application of Lotka's law to the scientific production of Indian Journal of Physics. *International Journal of Library and Information Studies*, *9*(1), 36-42.

Price, D. (1986). *Little science, big science... and beyond*. New York: Columbia University Press.

Quevedo, M., Vásquez, L., Quevedo, J., & Pinzon, L. (2020). COVID-19 and its effects on international trade. Ecuador case. *Science Domain, 6*(3), 1006-1015. http://dx.doi.org/10.23857/dc.v6i3.1330

Ramos, S. B. & Veiga, H. (2013). Oil price asymmetric effects: Answering the puzzle in international stock markets. *Energy Economics*, *38*(1), 136-145. https://doi.org/10.1016/j.eneco.2013.03.011

Rana, R., & Sharma, M. (2019). Dynamic causality testing for EKC hypothesis, pollution haven hypothesis and international trade in India. *The Journal of International Trade and Economic Development*, *28*(3), 348-364. https://doi.org/10.1080/09638199.2018.1542451

Sadorsky, P. (2012). Energy consumption, output and trade in South America. *Energy Economics*, *34*(2), 476-488. https://doi.org/10.1016/j.eneco.2011.12.008

Schroeder, T. C. & Tonsor, G. T. (2012). International cattle ID and traceability: Competitive implications for the US. F*ood Policy*, *37*(1), 31-40. https://doi.org/10.1016/j.foodpol.2011.10.005

Su, B. & Ang, B. W. (2013). Input–output analysis of CO_2 emissions embodied in trade: competitive versus non-competitive imports. *Energy Policy*, *56*(1), 83-87. https://doi.org/10.1016/j.enpol.2013.01.041

Tang, X., Snowden, S., & Höök, M. (2013). Analysis of energy embodied in the international trade of UK. *Energy Policy*, *57*(1), 418-428. https://doi.org/10.1016/j.enpol.2013.02.009

Tomás-Górriz, V. & Tomás-Casterá, V. (2018). Bibliometrics in the evaluation of scientific activity. *Home Hospital, 2(4),* 145-163. https://doi.org/10.22585/hospdomic.v2i4.51

Torres, G. (2021). Colombia and Asia-Pacific: an analysis of the evolution of relations with this important zone. *Razón Crítica*, *1*(11), 183-202. https://doi.org/10.21789/25007807.1697

Vega, L., Cantillo, V. & Arellana, J. (2019). Assessing the impact of major infrastructure projects on port choice decision: The Colombian case. *Transportation Research Part A: Policy and Practice, 120*(1), 132-148. https://doi.org/10.1016/j.tra.2018.12.021

Wagner, J. (2013). Exports, imports and firm survival: First evidence for manufacturing enterprises in Germany. *Review of World Economics*, *149*(1), 113-130. https://doi.org/10.1007/s10290-012-0141-2

Wang, Y., Wu, C. & Yang, L. (2013). Oil price shocks and stock market activities: Evidence from oil-importing and oil-exporting countries. *Journal of Comparative economics*, *41*(4), 1220-1239. https://doi.org/10.1016/j.jce.2012.12.004

Appendixes

Appendix 1: Ports of Colombia

Appendix 2: Ports of Colombia
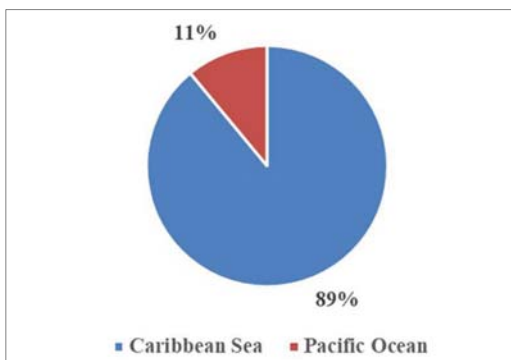
Appendix 3: Main Information theoretical background

Authors	Study Contribution
Barajas & Méndez (2021)	An analysis of the agricultural market in municipalities of Colombia towards the export process is presented.
Bobadilla & Venegas (2018)	They make an analysis of the most important seaports in Colombia and how they affect the processes of commercial exchange.
Cantillo, Cantillo, & Arellana (2018)	It proposes a model directed towards the process of choosing ports and countries for import export.
Cáceres (2022)	The cited research focuses on the analysis of the Latin American strip and route towards the strengthening of commercial processes between the continent and China.
Bernal, Strobel, & Praj (2019)	They proposed an analysis of the new scenario for Latin America in the face of the commercial and geopolitical opportunities of the Pacific Ocean, concluding that this State with respect to others has competitive weaknesses.

Torres (2021)	It proposes an analysis of the weaknesses of Colombia in the use of the Pacific Ocean as a competitive element in the import process with Asia.
Vega, Cantillo, & Arellana (2019)	Performs a quantitative analysis for the choice of a port based on official records of imports and exports.

Note: Own elaboration (2022)

Appendix 4: Main Information

Description	Results
Main information about data	
Timespan	2011:2022
Sources (Journals, Books, etc)	233
Documents	500
Average years from publication	5.15
Average citations per documents	8.34
Average citations per year per doc	1.23
References	13029
Document types	
article	424
article; book chapter	30
article; early access	17
article; proceedings paper	6
correction	1
editorial material	1
editorial material; book chapter	1
proceedings paper	17
review	3
Document contents	
Keywords Plus (ID)	695
Authors Keywords (DE)	1303
Authors	969
Authors	
Author Appearances	1111
Authors of single-authored documents	118
Authors of multi-authored documents	851
Author's collaboration	132
Single-authored documents	
Documents per Author	0.52
Authors per Document	1.94
Co-Authors per Documents	2.22
Collaboration Index	2.31

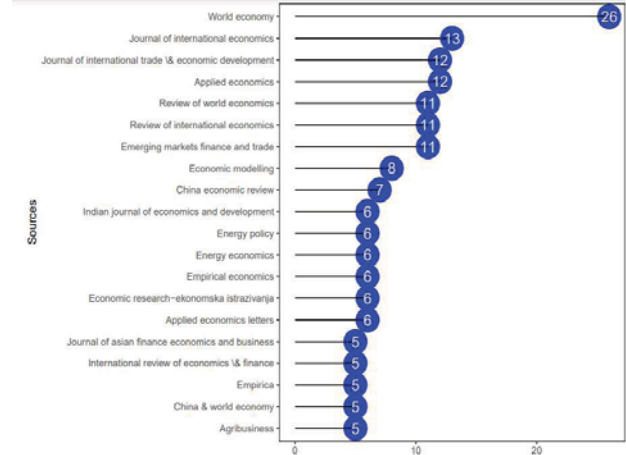Note: Own elaboration (2022)

Appendix 5: Lotka's Law

N. Articles	N. Authors
1	874
2	74
3	11
4	4
5	2
6	2
7	1
11	1

Note: Own elaboration (2022)

Appendix 6: Bradford's Law

Appendix 7: Annual Scientific Production

Appendix 8: Country Production
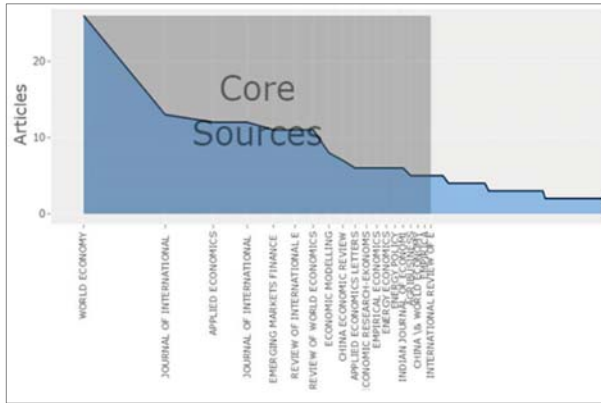
Appendix 9: Most Relevant Sources
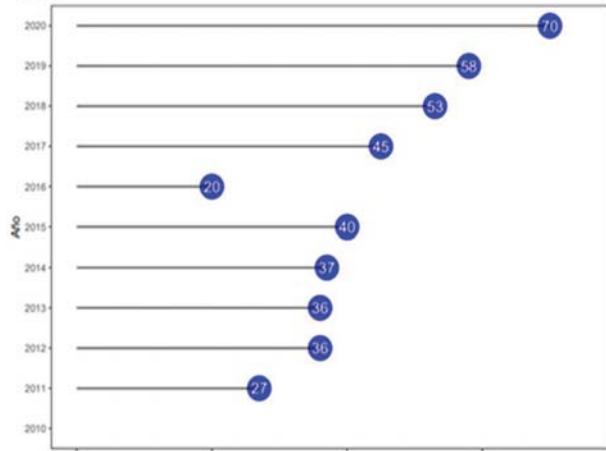
Appendix 10: Most Relevant Authors
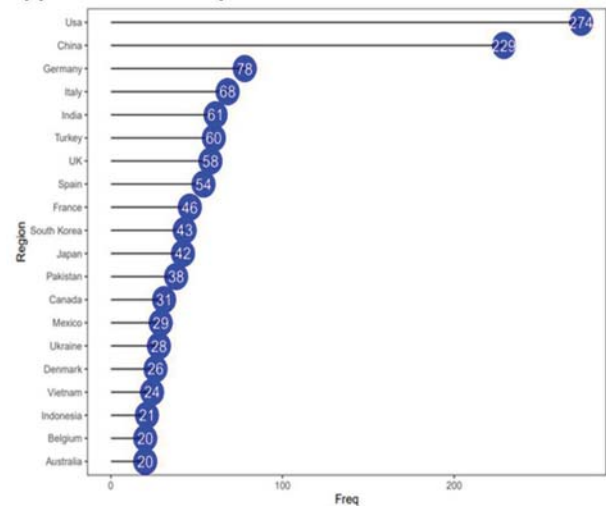
Appendix 11: Most Cited Papers

Paper	DOI	Total Citations
Wang Y., 2013, j comp econ	10.1016/j.jce.2012.12.004	235
Su B., 2013, energy policy	10.1016/j.enpol.2013.01.041	202
Sadorsky P., 2012, energy econ	10.1016/j.eneco.2011.12.008	182
Kasahara H., 2013, j int econ	10.1016/j.jinteco.2012.08.005	138
Fan H., 2015, rev econ stat	10.1162/REST_a_00524	130
Bas M., 2015, j int econ	10.1016/j.jinteco.2014.12.005	120
Bas M., 2014, rev world econ	10.1007/s10290-013-0175-0	90
Engel C., 2011, j int econ	10.1016/j.jinteco.2010.08.007	87
Haug A.A., 2019, energy econ	10.1016/j.eneco.2019.04.006	83

Bussiere M., 2013, am econ j -macroecon	10.1257/mac.5.3.118	79
Feng L, 2016, j int econ	10.1016/j.jinteco.2016.03.004	78
Dedeoglu D, 2013, energy policy	10.1016/j.enpol.2013.02.016	66
Muuls M., 2015, j int econ	10.1016/j.jinteco.2014.12.003	65
Cadot O, 2013, j econ surv	10.1111/j.1467-6419.2011.00719.x	58
Aristei D, 2013, rev world econ	10.1007/s10290-012-0137-y	54
Tang X., 2013, energy policy	10.1016/j.enpol.2013.02.009	52
Schroeder T.C., 2012, food policy	10.1016/j.foodpol.2011.10.005	45
Wagner J., 2013, rev world econ	10.1007/s10290-012-0141-2	40
Ramos S.B., 2013, energy econ	10.1016/j.eneco.2013.03.011	40
Rana R, 2019, J Int trade econ dev	10.1080/09638199.2018.1542451	40

Note: Own elaboration (2022)

Appendix 12: Authors and Institutions