Conceptual models of port governance

Modelos conceituais de governança portuária

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ABSTRACT
The port system is characterized as one of the main links in a country's logistics chain, contributing to the socio-economic development of the regions in which they operate. Port performance is the result of a diversity of activities by the various organizational and institutional actors present in this environment, which is materialized through port governance. Distributed in more than 900 international ports, port governance models have different mechanisms, depending on the environment in which the logistics-port chain is inserted. Brazil, in the process of professionalizing the port sector, has sought to identify models of port governance for implementation in the Brazilian port system. In this context, this article aims to identify the port governance mechanisms proposed by the most contemporary conceptual models in the scientific literature, to support their better understanding and to identify the knowledge gaps to support future research in the area. To this end, theoretical research was carried out, through a systematic literature review, using the electronic, international, and interdisciplinary Scopus database. The inclusion and exclusion criteria were applied and with the support of a search directed to the theme for the inclusion of new specialist publications, 12 conceptual models of Port Governance were considered. Even though the construct is a broad concept, it was possible to identify the conceptualization of the term, mechanisms, and components for its configuration. The models mainly include aspects of state participation; devolution; governance environment, strategy, structure, and dimensions; port reforms and performance and guidance for efficiency and effectiveness. However, the research results highlight that aspects of vertical and horizontal relationships deserve to be better explored; relationship networks; cooperation; co-production, and a systemic view.

Keywords: governance, port governance, conceptual models of port governance.
RESUMO
O sistema portuário caracteriza-se como um dos principais elos na cadeia logística de um país, contribuindo para o desenvolvimento socioeconômico das regiões nos quais estão inseridos. O desempenho portuário é resultado de uma diversidade de atividades dos diversos atores organizacionais e institucionais presentes neste ambiente, e que se materializa por meio de uma governança portuária. Distribuídos em mais de 900 portos internacionais, os modelos de governança portuária, possuem diretrizes distintas, em função do ambiente em que a cadeia logística-portuária está inserida. O Brasil, em fase de profissionalização do setor portuário, tem buscado identificar modelos de governança portuária para implementação no sistema portuário brasileiro. Neste contexto, este artigo tem por objetivo identificar os mecanismos de governança portuária propostos pelos modelos conceituais mais contemporâneos na literatura científica, de maneira a apoiar sua melhor compreensão e identificar as lacunas de conhecimento para embasar futuras pesquisas na área. Para tal, foi realizado uma pesquisa teórica, por meio de uma revisão sistemática da literatura, utilizando-se da base de dados Scopus eletrônica, internacional e interdisciplinar. Foram aplicados os critérios de inclusão e exclusão e com o apoio de uma busca dirigida ao tema para inclusão de novas publicações especialistas, foram considerados 12 modelos conceituais de Governança Portuária. Mesmo sendo o constructo um conceito amplo, foi possível a identificação de conceituação do termo, mecanismos e componentes para sua configuração. Os modelos trazem principalmente aspectos de participação estatal; devolução; ambiente, estratégia, estrutura e dimensões de governança; reformas e performance portuária e orientação para eficiência e eficácia. Entretanto, os resultados da pesquisa destacam que merece ser melhor explorados aspectos de relacionamentos verticais e horizontais; redes de relacionamento; cooperação; coprodução e uma visão sistêmica.

Palavras-chave: governança, governança portuária, modelos conceituais de governança portuária.

1 INTRODUCTION
The term “Port Governance” has been gaining prominence among academics researchers since the 1990s. In 1991, Georgison and Day from Simon Fraser University in Canada were the first authors who used the term “Port Governance” in their research, for through a conference paper. With the increasing port reforms developed in the countries, mainly the European ones, the productivity on the subject has been standing out, with greater emphasis, since the years of 2006.

With the current international competition, the efficiency and effectiveness of port structures, through public and private ports, and the economic development of a country, are related in parallel. For these structures to contribute as inducers to the strengthening of domestic and foreign trade, port governance is important, at the expense of the challenges of a globalized market.
The literature demonstrates that port governance changes over time, where the State was the focal point, and since the 1990s reforms have been implemented at an international level, providing greater interactivity for Port Authorities, as well as the insertion of private initiative in the port logistics universe.

Thus, Brooks and Cullinane (2006a), argue that the term “Port Governance” is characterized as a system that organizes a diversity of institutions and groups of individuals to achieve a common purpose, through rules, regulations, policies, and regulatory frameworks, with the participation of the public and private sectors. The term can also refer to corporate governance (involving the Port Authorities) or to the governance of business agglomeration (logistics-port chain), according to De Langen (2006). The author states that this second type of governance is characterized by the existing relationships between the actors in the logistics-port chain, as well as the coordination mechanisms used in this logistics chain (De Langen, 2004).

With a more contemporary view, Vieira (2013) clarifies that a conceptual model of port governance should be a reference for the analysis of port governance comprising the main dimensions of results, structure, elements, and actions, thus contributing, to the performance of the port, more than a model that includes the various combinations of structures for port management and control. Unlike port ownership and management models that reflect the allocation of responsibility for port activities, a port governance model must present a set of indicators that assume the risk and which are the lines of accountability in a complex and competitive environment sector (Brooks; Cullinane, 2006a).

The United Nations Conference on Trade and Development - UNCTAD (2019) points out that approximately 80% of the volume of international merchandise trade is transported by sea, using more than 900 ports, and the percentage is even higher for most developing countries. Among the main international ports with the best connectivity, from the UNCTAD classification (2019), the port of Shanghai / China stands out, followed by Singapore / China, Pusan / Korea, and Ningbo / China.

Among the Europeans, there are the ports of Antwerp / Belgium and Rotterdam / Netherlands. These ports, as well as the others located in Africa, Latin America, North America, and Oceania, and which are not among the 20 in the UNCTAD (2019) classification in connectivity, use different governance models (devolution, re-centralization, competition, regionalization, integration, corporatization, concession) due to their logistical realities (internal
and external), government policies and port reforms. As pointed out by Baltazar and Brooks (2006), there is no single way for the implementation of port governance, and that a more adequate way is aligned with each situation in which the port is inserted.

In this sense, two systematic reviews of the literature were found involving the universe of this research, but with different directions. The review by Woo et al., (2011), focused its efforts on the methodological perspective of publications. In contrast, Vieira, Kliemann Neto, and Amaral (2013) contributed by identifying governance models in the literature, but with a temporal variable restricted to the period from 1992 to 2011. Thus, this literature review contributes to the advancement of studies on the models of port governance, considering the period to the present date, registering new studies, due to the changes occurred in the world port sector.

From this context, this article aims to identify the port governance mechanisms proposed by the most contemporary conceptual models in the scientific literature, in order to support their better understanding and to identify the knowledge gaps to support future research in the area. To this end, a literature review was carried out, of a descriptive nature with an exploratory stage through bibliographic means, contemplating the most relevant publications for this study that deal with “Conceptual Models of Port Governance”.

Structurally, the article is presented in five sections. The first highlights the introduction, followed by the presentation of methodological procedures and the steps that support the development of the literature review. Presentation of results with a descriptive analysis highlighting the theoretical assumptions, limitations and advances, as well as a synthesis of the conceptual models of port governance complete the fourth section. Then, composing the fourth section, main initial mechanisms for a port governance model based on conceptual models. Finally, the final considerations are presented, highlighting the gaps in scientific knowledge that may support future research, as well as the bibliographic references used to compose this article.

2 METHODOLOGICAL PROCEDURES

This research constitutes a literature review, of a descriptive nature with an exploratory stage through bibliographic means (Marconi; Lakatos, 2009), with a competent to carry out an analysis of pre-existing knowledge about the “Conceptual Models of Port Governance”, promoting a dialogue subjective between different authors (Freire, 2013).
Initially, it was defined as the guiding question for this literature review: “Which port governance mechanisms are proposed by the most contemporary conceptual models in the scientific literature?

The review plan was prepared using the guidelines of Moher et al. (2009), comprising: i) identification of studies in the selected databases; ii) Screening with the removal of duplicate articles and the reading of titles and abstracts, guided by the inclusion criteria; iii) Complete reading of the articles and carried out the eligibility process; and iv) With the fulfillment of the criteria, the articles are directed to qualitative synthetics.

The research for this review was based on the electronic, international, and interdisciplinary Scopus database, as according to Freire et al. (2017, p.3) stands out as “[...] one of the largest sources of technical and scientific literature allows access to a sufficient amount of information for analysis and research.”

To capture publications, it was considered as a descriptor of the term "Port Governance" covering the exploratory phase. As inclusion criteria, they were considered as publications that referred to the term selected in the title, abstracts, and keywords. Therefore, a total of 155 publications were identified using the pre-selected descriptor. Thus, after the exploratory phase, the 155 publications were read, aiming to identify the works directed to the presentation and discussion of the “Conceptual Models of Port Governance”, using this criterion for the selection of publications.

Were excluded 60 studies because they dealt with port administration, ownership, management and regulation, reflecting the allocation of responsibility for port activities, involving performance, cluster capacity, port structure and sustainability, maritime freight, cruise ports and related topics. Furthermore, 86 specific studies of experiences in different ports, countries or regions were excluded. It is noteworthy that no publication was excluded before being read and analyzed. Google Scholar was used when the articles were not available from Scopus.

Respecting the guidelines of the Cochrane manual that allows the inclusion of materials that deal directly with the researched descriptor and that did not appear in the research, a directed search was carried out in the Brazilian Digital Library of Theses and Dissertations (BDTD) and the thesis of Vieira (2013) was added the basis for one of the publications already selected at Scopus, and the thesis of Cutrim (2017) that present proposals for conceptual models of port
governance. A search carried out on Google Scholar also considered the studies by Milan and Vieira (2011) and the complementary study by Cutrim, Botter and Robles (2018), the result of the thesis by Cutrim (2017).

Chart 1 summarizes the trajectory to determine the bibliography that included the 12 conceptual models of port governance.

<table>
<thead>
<tr>
<th>BATA BASE</th>
<th>CRITERIA</th>
<th>N</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scopus</td>
<td>Considered as a descriptor of the term &quot;Port Governance&quot; in the title, abstracts, and keywords.</td>
<td>155</td>
<td>155</td>
</tr>
<tr>
<td>Scopus Exclusion</td>
<td>Port administration, ownership, management and regulation, reflecting the allocation of responsibility for port activities, involving performance, cluster capacity, port structure and sustainability, maritime freight, cruise ports and related topics</td>
<td>(-) 60</td>
<td>95</td>
</tr>
<tr>
<td>Scopus Exclusion</td>
<td>Experiences in different ports, countries or regions</td>
<td>(-) 86</td>
<td>9</td>
</tr>
<tr>
<td>BDTD Inclusion</td>
<td>Inclusion</td>
<td>(+) 02</td>
<td>2</td>
</tr>
<tr>
<td>Google Scholar Inclusion</td>
<td>Inclusion</td>
<td>(+) 01</td>
<td>1</td>
</tr>
</tbody>
</table>

Bibliography for analysis 12

Source: Prepared by the authors.

Thus, the general objective can be met by identifying the mechanisms of port governance proposed by the most contemporary conceptual models in the scientific literature.

3 PRESENTATION OF RESULTS

Studies dealing with port administration, structures, and functions addressing port management and control models with the participation of the public and private sectors in the functions of regulation, ownership, and operation, were not considered. In this understanding, the Brooks and Cullinane (2006a) Modular Model of Port Governance are not contemplated “[…] considered only a classification of ports according to their structure” (Vieira, 2013, p. 13) and the hypothetical conceptual structure for the Verhoeven Port Authorities (2010), also focusing on the governance structure and port functions, with an emphasis on the characteristics of the Port Authorities (conservative, facilitator and entrepreneur). Studies describing/analysing governance in different ports were also not considered.

Thus, under the genesis of the initial and advanced conceptual models of port governance, also considering models that propose structures for analysis and actions of port governance, those selected in the literature that deal with the internal and external domain of the ports of Wang and
Slack stand out (2004); the three-dimensional model of Wang, Ng and Olivier (2004) covering the axes of jurisdictional-spatial scales, stakeholder community and logistical capabilities; the Matching Framework model by Baltazar and Brooks (2006) highlighting the environment, strategy and structure as governance mechanisms; the firm-government relationship of Brooks (2002) and Brooks and Cullinane (2006b); the reform and port performance of Brooks and Pallis (2008); the model of Milan and Vieira (2011) that encompasses governance actions, the model relating who / how / what and for what governs Vieira, Kliemann Neto and Monfort-Mulinas (2013); the proposal of the Cutrim corporatization model (2017); the governance, performance and influencing mechanisms of Caldeirinha et al. (2018); the polycentric governance of Monios (2019), the understanding and detailing of the relationships of who / what / how / for who governs by Zhang et al. (2018; 2019) and the governance and value creation analysis proposed by De Martino, Magnotti and Morvillo (2020).

Regarding the importance of this literature review, it is emphasized that only two complete systematic reviews were found in the literature and developed by Woo et al. (2011) and Vieira, Kliemann Neto, and Amaral (2013, 2014), both involving the port universe, but with different directions and results. The first study aimed to investigate how research on seaports was carried out from a methodological perspective, analyzing port literature published in the last three decades (1980–2000). In its keywords, the following stand out: port research, structured literature review, research paradigm, research method, interdisciplinarity, port research, and analysis technique.

The second study, part of a chapter of a thesis and later published in the Journal Transport Reviews (2014) aimed to describe the evolution of research on the topic from 1992 to 2011, to identify the governance models developed from these researches and to analyze the guidelines of these models and their contribution to sports development. In its keywords, the following stand out: port governance, port performance, models, and systematic review.

This literature review advances the knowledge and guidelines, mechanisms, gaps, and new developments of the “Conceptual Models of Port Governance”, since the previous study had the period from the 1990s to 2011, and this considers the publications until the present date.
3.1 CONCEPTUAL MODELS OF PORT GOVERNANCE: ASSUMPTIONS, LIMITATIONS, AND ADVANCES

The model proposed by Wang and Slack (2004) considers state participation in a regional context and assumes the internal domain, establishing a publicly owned port authority, with initiatives for inserting the private sector in port operations and development plans prepared by the ports.

The external domain is influenced by the planning environment, infrastructure and public services, fiscal and financial environment, and legal environment where the port will be inserted. Competition and co-development between ports can add another dimension to regional or national governance, favoring port development.

Considering the proposal by Wang and Slack (2004) limited when considering the port as a central governance unit in the internal and external domain relations of the port itself, the Wang, Ng, and Olivier (2004) model advances in the sense of understanding that the port is not the only and/or most important entity in addressing logistical capabilities and the majority of private entries occur at the terminal level (corporate participation).

Thus, they propose the Three-Dimensional Model, expanding the scope of governance, decentralizing power (jurisdictional-spatial scales), considering a scalar axis (local, regional, national and supranational), the insertion of multiple actors (stakeholder community), and logistics adding value (logistical capabilities).

Through the special edition of Research in Transportation Economics magazine entitled “Devolution, Port Governance, and Port Performance”, Baltazar and Brooks (2006) propose the Matching Framework model, the fruit of the work presented by the authors in Seoul / South Korea at the World Conference on Transport Research (2001), which deals with the need for adjustments between the environment, strategy, and structure for better port performance.

The model provides a theoretical approach between governance and devolution (a term that is characterized by the transfer of responsibilities from the State to the private sector), according to each situation (Contingency Theory).

Vieira, Kliemann Neto, and Monfort Mulinas (2013) argue that the model is useful for the analysis of port governance, however, it was not sufficiently applied to validate the links between the mechanisms (environment-structure, strategy-structure, and environment-strategy), as well as the relationship between the governance model and port performance.
The authors also claim that the model does not fill gaps regarding the results (more details are lacking), actions (greater discussion of the types of actions and ways of implementation), elements of governance (the actors in the logistics-port chain and interactions), and how to operate in a port reform process.

With a small detail of the Matching Framework model, proposed by Baltazar and Brooks (2006), Brooks and Cullinane (2006b) from the conceptual model of Brooks (2002) discuss the relationship between governance at the government level and at the firm level, through a conceptual model and proposing a research agenda to validate the model.

The authors consider the results of governance at the government level as an element of the governance environment at the firm level, and the results at the firm level, as a component for the analysis of the governance environment at the government level. However, the model fails to advance and the same gaps pointed out in the model proposed by Baltazar and Brooks (2006) continue.

With a greater emphasis on detailing the process of implementing port reforms in their different stages, as well as port performance indicators, from internal (efficiency) and external (effectiveness) aspects and also deepening the Matching Framework Model (Baltazar; Brooks, 2006), Brooks and Pallis (2008) propose a Model for the Implementation of Port Reforms and Port Performance.

It is noted that the authors advance in detailing the form of implementation of the proposed model, relating the inputs/outputs (stage 1 for decisions and stage 2 for model) of port governance. Likewise, the detail is also presented for port performance (model output), divided into internal (efficiency) and external (effectiveness). Finally, the model provides for the definition of port policy (ownership, objectives, and management) and also adjustments to the model with decisions made by governments and/or key actors.

Vieira et al. (2014) report that in terms of performance evaluation, the authors of the model identified that most ports only measure port efficiency (and do not consider effectiveness), however, they did not identify a conclusive relationship between governance and port performance, which finds an echo in the literature, conclude the researchers. However, gaps remain regarding the details of the actions, elements, and results of governance, the authors point out.
With a focus on governance actions, Milan and Vieira (2011) propose a model to support the study of governance in port-logistics chains. They contribute to aspects related to governance actions, such as Training and Knowledge Management; Port Management and Operations; Quality of Services and Alignment of the Port Community; and Safety, Social Responsibility, and Environmental Management.

However, as they do not advance in other pointed gaps and do not deal extensively with the relationship between governance and performance, it is characterized as a limited model, an argument also corroborated by Vieira and Kliemann Neto (2013).

From the gaps pointed out in the previous models, Vieira, Kliemann Neto, and Monfort Mulinas (2013) advance in answering important questions for governance meeting what is expected in a conceptual model of port governance, incorporating dimensions of results, structure, elements, and actions, strengthening port performance (Vieira, 2013). Thus, they propose a conceptual model to support the analysis of governance in logistics-port chains, discussing its operationalization in a port reform process.

In greater detail, the proposed model lists issues: why it governs, who governs, how it governs and what it governs with the dimensions of results, structure, actions, and elements of governance, respectively. Besides, they present a system for the application of the model in a port reform process and also bring the proposal of a questionnaire for the application of the model.

Future studies can be carried out, according to the guidelines of Vieira and Kliemann Neto (2013) considering the three phases (pre-reform environment, port reform, and post-reform environment), with the application of the model with adjustments in other types of cargo, other ports with different management models, as well as deepen the discussions on governance results with studies already carried out on port performance analysis.

With an approach aimed at a new structure with an emphasis on port planning and governance and also contemplating a new institutional arrangement for Brazil, the application of the Corporation Model combined with the Landlord Port management model is proposed by Cutrim (2017). The author points out that the lack of planning and coordination between waterway transport, dysfunctions, and lack of coordination between institutions, low levels of execution, and overlapping responsibilities harm the governance structure of the Brazilian port system.
Cutrim, Botter, and Robles (2018) point out that one of the most critical points in Brazil is the political-party influence in the port administration, leading to the indication of professionals with no profile for positions within the port authorities, as well as the substitutions, arising from the exchange of information, political party groups in power, implying decisions on investments and financing without considering technical and scientific aspects. In this sense, the authors emphasize that corporatization as a model of port governance needs studies and further study, due to its adequacy and complexity. They also point out that in Brazil, it would require new legislation and regulations, in addition to a discussion involving the entire port sector, changing the current interests and the respective active groups.

The model proposed by Caldeirinha et al. (2018) seeks to understand the influence of the governance model mechanisms on port performance, from the governance model mechanisms, the port performance mechanisms, and the governance mechanisms that influence the port performance. The authors confirm the existence of mechanisms of the port governance model and their relationship with the highest levels of performance, viability, profit, efficiency, and effectiveness, as well as conclude that such mechanisms directly influence the performance of ports.

The results show that “[...] the main characteristic of governance is private port operations, through concessions, although land ownership and port management must be kept public and not private (Caldeirinha et al., 2018, p. 889). The authors point out that the port authority's focus should be on the logistics chain, abandon port operations, and avoid direct participation in inland transport or the management of logistical areas.

They also emphasize the importance of the port authority's business vision, autonomy from the government, control carried out by an internal organization of the port itself, aiming at the port's performance, including profitability, efficiency, and effectiveness. Finally, they conclude that it is important to bring port governance closer to the liberal model, revealing the success of this model in northern Europe and the world, and to extend the study to other countries, with different governance models, with the inclusion of environmental and local factors that may affect the model.

From the perspective of a polycentric governance model, Monios (2019) understands that governance goes beyond borders, involving multiple government scales with links between governmental, non-governmental organizations and individuals and with multiple centers of
authority, without a dominant actor course, characterized as a mixture of scales, with the participation of public, private, third sector and informal community groups. In this context, the application of a polycentric approach makes it possible to explain and try to identify and classify the relationships, influences, and power relationships that guide the final decisions and actions.

In response to the four questions raised by Vieira et al. (2014) and towards understanding “who governs”, “what is governed”, “how to govern” and “govern for what”, Zhang et al. (2018) and Zhang et al. (2019) present a framework for port governance, detailing the relationships between the four basic issues of port governance, concluding that multilevel governance has become a feature of port governance.

The proposal for the Port Governance and Value Creation Analysis Model by De Martino, Magnotti, and Morvillo (2020) is based on the relationship networks that shape the competitive and cooperative dynamics between the port authority and private port operators to manage the resources supply chain at the local level. With this, it allows us to identify the limits for an active role of the port authority, either as a facilitator or an entrepreneur.

Based on the conceptual models analyzed, Chart 2 summarizes the theoretical assumptions, the objective of the port governance model, and the application of the proposed model.
<table>
<thead>
<tr>
<th>MODEL PROPOSAL</th>
<th>AUTHORS</th>
<th>THEORETICAL ASSUMPTION</th>
<th>OBJECTIVE OF THE GOVERNANCE MODEL</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The internal and external domain of the port</td>
<td>Wang e Slack (2004)</td>
<td>In the internal domain, the question of terminal ownership is seen as vital, and the external domain is influenced by the planning environment, infrastructure and public services, fiscal and financial environment, and legal environment where the port will be inserted.</td>
<td>Analyze port governance in a regional context, proposing two domains related to governance: i) internal domain, and ii) external domain.</td>
<td>Applied through a case study involving the Yangtze River Delta / China.</td>
</tr>
<tr>
<td>Three-dimensional</td>
<td>Wang, Ngb e Olivier (2004)</td>
<td>Most private insertion occurs at the terminal level (corporate participation) and the port is no longer the only and/or most important entity in addressing logistical capabilities.</td>
<td>Addressing port governance through three axes: jurisdictional-spatial scales, stakeholder community, and logistical capabilities.</td>
<td>It addresses China’s port development, considering the ports of Shenzhen and Shanghai.</td>
</tr>
<tr>
<td>Matching framework</td>
<td>Baltazar e Brooks (2006)</td>
<td>Theoretical approximation between Governance and Devolution (a term that is characterized by the transfer of responsibilities from the State to the private sector), according to each situation (Contingency Theory).</td>
<td>Understand the relationship between the mechanisms (environment-structure, strategy-structure, and environment-strategy) and the relationship between the governance model and port performance.</td>
<td>Used in case studies involving Canadian Ports.</td>
</tr>
<tr>
<td>Firm-government relationship</td>
<td>Brooks (2002) / Brooks e Cullinane (2006b)</td>
<td>The results of governance at the government level as an element of the governance environment at the firm level, and the results at the firm level, as a component for the analysis of the governance environment at the governmental level.</td>
<td>Discuss the relationship between governance at the government level and the firm level using the Matching Framework Model.</td>
<td>Essentially conceptual.</td>
</tr>
<tr>
<td>Implementation of port reform and performance</td>
<td>Brooks e Pallis (2008)</td>
<td>The details of the process of implementing port reforms in their different stages, as well as port performance indicators covering internal (efficiency) and external (effectiveness) aspects.</td>
<td>Detail the port reform process considering the different stages and port performance indicators, deepening the Matching Framework Model.</td>
<td>It was not fully applied, using the verification of performance indicators, through a sample of 12 port authorities in five countries (Italy, Canada, Korea, United States of America - USA and United Kingdom).</td>
</tr>
<tr>
<td>Governance actions</td>
<td>Milan e Vieira (2011)</td>
<td>Model consisting of four axes: Training and Management</td>
<td></td>
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<td>-----------------------------------</td>
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</tr>
</tbody>
</table>

| Who / how / what / for who governs | Zhang et al. (2018, 2019) | The results of governance (for who governs) indicate the need for actions (how to govern) that will be implemented in the elements of governance (what governs), based on the existing governance structure (who governs). | Support the analysis of governance in logistics-port chains, discussing their operationalization in a port reform process. | A comparison of the governance of the Ports of Valencia and Santos was made based on the proposed conceptual governance model. Interviews were conducted with managers (qualitative phase) and also a survey with users (quantitative phase) of the listed ports. |

| Corporatization | Cutrim (2017) | In response to the four questions raised by Vieira et al. (2014) and towards understanding “who governs” and “what is governed” (ZHANG et al., 2018) and “how to govern” and “govern for what” (ZHANG et al., 2019). | Understand and detail the relationships between the four basic port governance issues. | The study is based on a total sample of 118 studies on port governance. |

| Governance mechanisms, performance and performance influencers | Caldeirinha et al. (2018) | The lack of planning and coordination between water transport, dysfunctions, and lack of coordination between institutions, low levels of execution, and overlapping responsibilities harm the governance structure of the Brazilian port system. | Propose a new planning and governance structure for Brazil. | The research was carried out with specialists from public and private institutions and also with the Port of Santos. |

| Polycentric governance | Monios (2019) | The application of a polycentric approach makes it possible to explain and try to identify and classify the relationships, influences, and power relationships that guide final decisions and actions. | Analyze port governance mechanisms and port performance factors and also understand the influence of governance model mechanisms on port performance. | Application of a questionnaire with 955 managers of companies operating in the five main Portuguese ports, with 105 validated responses. |

| Polycentric governance | Monios (2019) | The model is based on three hypotheses that contemplate the mechanisms of the governance model, performance, and the factors that influence port performance. | Find evidence of how each factor operates in the port system, with the inclusion of different actors at different scales and with overlapping jurisdictions. | Conceptual framework. |
| Analysis of port governance and value creation | De Martino, Magnotti e Morvillo (2020) | The relationship networks that shape the competitive and cooperative dynamics between the port authority and private port operators to manage supply chain resources at the local level. | Identify the limits for an active role of the port authority, either as a facilitator or an entrepreneur. | The model was applied in two Italian ports: La Spezia and Trieste Marine. | Source: Prepared by the authors mentioned above. |
4 MAIN INITIAL MECHANISMS FOR A PORT GOVERNANCE MODEL BASED ON CONCEPTUAL MODELS

With the understanding of the conceptual models of port governance previously presented, considering their advances and knowledge gaps, it is possible to identify the main initial mechanisms for a model of port governance to be applied in the Brazilian case.

In fact, the internal and external domains of the port (Wang; Slack, 2004) must be respected, since they influence the actions and guidelines of the entire logistics-port chain, however, a port should not be seen in isolation (Wang; Ng ; Olivier, 2004), as it is characterized as a critical infrastructure, associated with externalities and with internal stakeholders that dialogue with a diversity of external port stakeholders (Aerts, 2012; Lacerda, 2013; Notteboom, Winkemans, 2002) composed of groups of transport operators, such as (port operator); corporate transport groups (road and rail transporters), support services (pilotage), industrial groups (exporters and importers), infrastructure coordination, facility and management groups (dry ports and back port terminals) legislation and public policy groups (government federal, state and municipal) and community groups (taxpayers and local community) inserted in a municipal, regional, state, national and international environment, thus composing a highly complex universe.

With this complexity, the models need adjustments concerning the environment, strategy, and structure with aspects of efficiency and effectiveness (Baltazar; Brooks, 2006), and must also include mechanisms that involve the stakeholders, people, and the necessary leadership for port governance, as well as the relationship, pointed out by Brooks and Cullinane (2006), at the government level and the firm level and is aligned with the process of implementing port reforms and performance, described by Brooks and Pallis (2008).

Another important aspect for the implementation of port governance in Brazil is to bring to the governance process questions such as: what governs, who governs, how it governs and what is governed, with the allocation of dimensions of results, structure, actions, and governance elements, referring to the model proposed by Vieira, Kliemann Neto and Monfort Mulinas (2013) and Zhang et al. (2018, 2019). It is also worth mentioning the importance of vertical and horizontal relationships (MONIOS 2019), one of the assumptions of multilevel governance, because according to Budd, Sancino (2016) and Papadopoulos and Piattoni (2019), this type of governance considers the changes in relations to from actors located at different levels of
performance, replacing the hierarchy by asymmetric, but coordinated, the interaction between such actors.

Finally, relationship networks also stand out as important characteristics for a port governance model, with aspects of competition and cooperation between port authorities and private port operators at the local level, presented in the model proposed by De Martino, Magnotti, and Morvillo (2020).

5 FINAL CONSIDERATIONS

“Port Governance” is characterized as a system that organizes a diversity of institutions and groups of individuals to achieve a common purpose, through rules, regulations, policies, and regulatory frameworks, with the participation of the public and private sector (Brooks; Cullinane 206a).

Based on this concept, this literature review aimed to identify the port governance mechanisms proposed by the most contemporary conceptual models in the scientific literature, to support their better understanding and to identify the knowledge gaps to support future research in the area.

It was found that there are different “Port Governance Models”, constituted by different and complementary views and worldviews and that even though the construct is a broad concept, it was possible to identify the conceptualization of the term, as well as the identification of mechanisms and components. Thus, this study contributes to a review of the complete literature (last 30 years), also highlighting the theoretical assumptions, objectives of the models of governance, application, limitations, and advances.

It is observed that in its great majority, the models bring in their genesis state participation and return; environment, strategy and governance structure; port reforms and performance; governance results; governance actions and elements; orientation towards efficiency and effectiveness; corporatization; so that who, how and what governs (Baltazar; Brooks, 2006; Brooks; Cullinane, 2006; Brooks; Pallis, 2008; Cutrim, 2017; Milan; Vieira, 2011; Vieira, Kliemann Neto; Monfort Mulinas, 2013; Wang; Ng; Olivier, 2004; Wang; Slack, 2004). More recent models already bring aspects of vertical and horizontal relationships, relationship networks, competition, and cooperation (Monios, 2019; Zhang et al., 2018, 2019, De Martino; Magnotti; Morvillo, 2020).
Such models are important to determine the initial mechanisms for a model of port governance to be applied in the Brazilian case, providing subsidies for the elaboration of a model of port governance that recognizes such mechanisms. However, a port governance model must also recognize and draw attention to a research agenda, moving towards a shared governance for the common good, incorporating the co-production of collective solutions, shared decision-making, intra and inter-organizational networks to enhance the collaboration between different actors, cooperation, respecting regional individuals and using them as a competitive advantage, advancing towards a complete systemic vision.

It is also noteworthy, and corroborating with Vieira, Kliemann Neto, and Monfort Mulinas (2013), that the studies are still concentrated in journals and authors, and that these limitations can be reduced with the use of gray literature, characterized as limitations of this study.

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