Public Procurement of Innovation in Latin America

A Comparative Analysis of the most Innovative Countries

Julia, R. A., Veneziani
School of Arts, Sciences and Humanities of University of Sao Paulo (EACH/USP), Study Group on Technology and Innovations in Public Management (GETIP)
juliaveneziani@usp.br

José, C., Vaz
School of Arts, Sciences and Humanities of University of Sao Paulo (EACH/USP), Study Group on Technology and Innovations in Public Management (GETIP)
vaz@usp.br

ABSTRACT

The present research aims to investigate the procedures of public procurement of innovation adopted by five countries ranked as the most innovative in Latin America, being: Chile, Mexico, Costa Rica, Brazil and Uruguay. The methodology adopted was a comparative analysis of the innovation procurement procedures used by the selected countries in accordance with the guidelines established in the European Guide on Public Procurement for Innovation 2021. To this end, the technique of structured analysis of government portals from a set of key words in Spanish and Portuguese was used for data collection. As a result, it was possible to structure a representative picture of the Comparative Panorama of Policies for Public Procurement of Innovation in Latin America. In this way, it was observed that Costa Rica, Brazil and Uruguay present a well-defined legal framework concerning public procurement of innovation, while Chile and Mexico contain few directives and guidelines that facilitate specific procurement procedures as promoters of innovation. In general, the selected countries use the traditional procedures for procurement of innovation suggested by the European Guide presenting some differences in their application. Finally, it points to a research agenda on the application of innovation policies with interdisciplinary approaches in interpreting the innovation systems of each Latin American nation, case studies on the application of these mechanisms and also research on new international standards for procurement of innovation procedures for Latin America.

CCS CONCEPTS

• **Social and professional topics**; • **Computing / technology policy**; • **Government technology policy**;

KEYWORDS

Public Procurement of Innovation, Latin America, Comparative Analysis

ACM Reference Format:
Julia, R. A., Veneziani and José, C., Vaz. 2023. Public Procurement of Innovation in Latin America: A Comparative Analysis of the most Innovative Countries. In *16th International Conference on Theory and Practice of Electronic Governance (ICEGOV 2023), September 26–29, 2023, Belo Horizonte, Brazil.* ACM, New York, NY, USA, 8 pages. https://doi.org/10.1145/3614321.3614337

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from permissions@acm.org.
ICEGOV 2023, September 26–29, 2023, Belo Horizonte, Brazil
© 2023 Copyright held by the owner/author(s). Publication rights licensed to ACM.
ACM ISBN 979-8-4007-0742-1/23/09…$15.00
https://doi.org/10.1145/3614321.3614337

1 INTRODUCTION

According to [1] innovations in the public sector are justified by situations in which government intervention tends to generate more challenges than solutions, i.e., government failures that cause waste of resources having as a consequence not only the growth of increasingly complex and structuring problems, but also the increase of demand for better services. The theme of innovation in government is not new, and has been increasingly discussed, since it is through innovation policies that the State assumes the position of inducer of a favorable environment for both the private sector and for the development of its own entrepreneurial capacity, acting in network with multiple stakeholders in favor of economic development. To really understand how policies on this theme occur, [2] point out six major models in which the government appropriates the functions related to innovation.

The first, refers to public investment in science, technology and innovation (ST&I) carried out through promotion and research agencies, in which the public sector generates conditions for the market to innovate and conceives great sources of innovation [3]. The second model is innovation by public procurement, which is the process of co-production and acquisition by the State of new technologies, products and services that are being developed by the market, containing transformation potential for society, which is the object of analysis of this article. The third model deals with economic institutional innovations that occur through new institutional solutions that aim to modify the rules of economic operations and are carried out by regulatory agencies. The fourth model is political institutional innovations, that is, innovations that change the rules of the political game with the aim of increasing society's participation in the decision-making process. The fifth is innovations in public services, which occur due to the process of internal governmental modification to improve the provision of services and administrative processes, which can be carried out through digital transformation. Finally, the sixth model is organizational innovation, which is the creation of organizations, changes in decision-making or management processes, occurring through innovation laboratories that carry out learning and experimentation projects.

This research aims to address the model of innovation via public procurement because it is an mechanism that encourages the rise of innovations not only for business, but also government that enable the strengthening of sovereignty, economic and technological development of the country. According to the [4], about 12% of the GDP of member countries corresponded to public procurement. In

this scenario, public procurement of innovation has gained relevance both in the debate on innovation policies, as well as in the debate on improvements in the provision of public services. Thus, this model was gradually incorporated into the body of innovation policy mechanisms, culminating in 70% of countries adopting public procurement of innovative goods and services as a strategy at the central level [4]. This is due to the growing demand for solutions to complex problems faced by society, which can be addressed through public procurement as an means that encourages the emergence of innovations at the national level and has the potential to strengthen regional development. In addition, this innovation model has the power to solve coordination failures, promote user-supplier interaction, reduce information asymmetries and transaction costs and improve the provision of public goods [5]. In this sense, the State assumes the role of innovation user with the aim of improving effectiveness and efficiency in the provision of public services (health, education, defense, environment, among others) generating learning and demonstrating the usefulness of technological innovations as a national strategy for development policies.

That said, the present research proposes to conduct a comparative analysis of public procurement practices for innovation among the five countries ranked as most innovative in the Latin American region by the World Intellectual Property Organization (WIPO) World Innovation Index 2021, being: Chile, Mexico, Costa Rica, Brazil and Uruguay. The preference for investigating these cases is justified by their characteristic of regional leadership in innovation, which allows us to assume that it is in these countries where the most varied and in-depth incidence of public procurement practices for innovation will be encountered. The adoption of the WIPO ranking does not ignore the consequences of the particularities of the political processes and institutional frameworks of the countries on their innovation and public procurement systems. However, a deeper understanding should be the object of future analyses, since discussing the historical context of each country and the guiding principles of each national innovation system is beyond the scope of this article. Furthermore, we emphasize the low representativeness of Latin American studies on the adoption of innovation models, including public procurement of innovation. Therefore, it is necessary to understand the importance of research on how Latin American countries deal with this theme, considering the experiences and fundaments of the cases of European countries.

In such reasoning, the article aims to present, in the light of what is shown in [6] to investigate the models of innovation procurement, a comparative table that includes the main dimensions off resources to induce national innovation through public procurement in the selected countries encompassing laws, decrees, guidelines and platforms. To this end, the research seeks to understand the model of innovation by public procurement from the productions of [7], [8], [9], [10], [5] and [11]. To conduct this discussion, the article is organized as follows: initially a brief observation of the current scenario of innovation policies in Latin America is presented, then the definition of public procurement of innovation and the methodology used are exposed, and then the results and discussions of the analysis are treated. At last, the final considerations are pointed out, with emphasis on the potential contributions of this analysis proposal and the possible paths to be followed by a research agenda.

2 PUBLIC POLICIES OF INNOVATION IN LATIN AMERICA

Among the first proposals of theoretical analysis about the logic of innovation policies is the "Linear Model of Innovation", which assumes as a precept that innovation follows a clear logical thread defined by the following stages respectively: basic research, applied research, development, production and diffusion [12]. In this meaning, the innovative process would be a hierarchical system of successive investigations that aim to commercialization. Despite being a widely spread model and extremely studied by academics, economists, industrialists among other professionals and adopted as a standard by the OECD (Organization for Economic Cooperation and Development), it is also a concept target of much criticism. According to [13], the innovation process is not uniform, much less linear, that is, one cannot assume as a premise that all innovations have their beginning marked by the stages of research and its composition does not occur homogeneously. For the authors, innovation process is complex and carries several characteristics.

As a counterpoint to the linear model, there is the Latin American Thinking on Science, Technology and Society (PLACTS), which starts from the "dependency theory" arguing that Latin American countries are kept in a subordinate position towards developed countries because of the imbalance of power relations and international trade. In agreement to [14], the national goals of public policies of innovation would only be achieved if the institutional transfer and diffusion of international models were carried out considering the social, cultural and economic context of Latin America.

> "The historical evolution of science and technology policy in Latin America, in general, presents a linear chain in the logic of innovation, since it has as its principle, almost exclusively, the university and research institutes as the ones responsible for the quality and expansion of scientific potential. In this way, S&TI and R&D end up being configured as academic contents and, consequently, presenting not very significant indexes in these sectors." [15]

The PLACTS points out that until the beginning of the XXI century, Latin American innovation policies assumed that local companies were like those in developed countries. For [15], this scenario resulted in a historical delay in the development of the STI&I sector in Latin American countries. Despite the existence of national innovation projects, while the logic of large-scale primary producer is not altered to producer of technology, goods and services, Latin America would continue in the role of lucrative consumer of international trade. Until 2014, the World Bank study, led by [16], pointed out that the countries of the region grew below the global average in innovation and entrepreneurship highlighting an insufficient innovation policy for the region.

> "It is in this domain of entrepreneurship that businesses in LAC score relatively badly. LAC firms introduce new products less frequently than firms in otherwise similar economies, high-en entrepreneurs tend to be far away from global best practices in the management of their enterprises, firms' investment in R&D is low, and patent activity is well below benchmark levels." [16]

Currently, the region faces complex demands for social and economic recovery from the effects of the Covid-19 pandemic. To this end, the two-year program of cooperation activities 2022-2023 was approved at the 3rd Meeting of the Conference on Science, Innovation and Information and Communication Technologies, organized by the Economic Commission for Latin America and the Caribbean (CEPAL). The program aims to strengthen the public sector to sponsor the development of ST&I policies, establish strategic challenges that can be solved through innovation in the region, and stimulate regional and international cooperation among member countries. There is a growing interest in Latin America to regulate the public procurement of innovation, by defining explicit regulatory frameworks (Laws or Legislative Decrees), establishing policy frameworks and explicit guidelines, piloting and testing their implementation. However, although the studies on procurement of innovation have advanced, there are different definitions that even characterize the dynamics in which they are inserted. To this end, in the following topic it will be treated such definitions.

3 DEFINITIONS OF PROCUREMENT OF INNOVATION

After all, what is the difference between traditional public procurement and public procurement of innovation? In the traditional model, the State aims to obtain products or services that are already available on the market or that need little customization for use. In this case, these purchases are known as "off-the-shelf products", since they do not need to be specially made to meet a specific purpose. Innovation procurement, on the other hand, occurs when the product or service is not yet available on the market, i.e., the solution desired by the public authority needs to be developed or co-created [7], [8], [9], [10]. According to what is shown in [6], a public procurement of innovation is characterized when one or two of the following situations occur: (i) procurement of the innovation process, in which the state procures Research and Development (R&D) according to its needs; (ii) procurement of the innovation result, in which the public administration operates as a first user of a new solution in the market.

In the words of [5], the public purchase of innovation is related to the creation of completely new and technologically advanced products and services or processes that do not exist yet, and is also a means of promoting any improvement, development and technological adaptation of solutions. Thus, the responsibility of public policies both on the supply side that use financing lines, economic subsidy and tax incentives, as well as on the demand side that are specifically government procurement and regulation to support research and development has received prominence and relevance, since they ensure favorable conditions for innovation processes. Moreover, this model of innovation policy takes into consideration aspects of standardization of legal instruments, costing the life cycle of the process, corporate social responsibility, dissemination of best practices and procurement tools, and social aspects.

The State becomes an actor that induces innovation through public procurement of innovation assuming one of three roles: a) potential market, b) parameter setter for new products and processes, c) creator of new market conditions that impact competitiveness [17]. To this end, there are international standards for the application of public procurement of innovation, as pointed out below:

> "Standardization is often seen as a contradiction to innovation, but it can serve as a catalyst for innovation, especially by defining test standards, methods and quality certificates. In light of globalization and international trade, the importance of standardization is evident for national procurement strategies. It also affects different aspects of the procurement process itself (standardized tender specifications, e-procurement, life-cycles costs, production quality, etc.)" [18]

In this context, it is presented the main examples of public procurement of innovation according to the observed literature: (a) contracts by negotiation [11], (b) by concession [18] and (c) incentive contracts for Research and Development [6]. In the case of commercial contracts by negotiation or concession, the government can use public purchases that require the adaptation of easily available solutions that are of a complex nature, or whose technical specifications cannot be defined with sufficient precision occurring through purchases by negotiation. In R&D incentive procurement, the government finances the research and development phase of new technologies or products, enabling companies to test and refine them before releasing them to the market, with specific terms and conditions relating to intellectual property. This can occur through open innovation challenges where the public authority establishes in a structured way the challenges faced by the proponent body aiming at solving problems from the development of new technologies, products or services [11], or innovation partnerships (cooperative), in this model the State associates with external actors, such as companies and universities, to develop research and innovation projects.

Besides the models, there are procedures strongly recommended to manage the procurement process itself such as those present in [6]. Given that the document prepared gathers years of experience of public policies for innovation by the demand adopted in Europe, its importance as an international parameter of innovation procurement is understood. Thus, this paper will use as standard the categories of innovation procurement procedures indicated by the Guide. Given these characteristics, in the next topic we address the methodological steps adopted to organize these aspects in the Latin American context.

4 METHODOLOGY

The comparative perspective analysis is a methodology used in applied social sciences to study varied phenomena, as it aims to identify similar and different aspects concerning the object of research. According to [19], the comparative method enables a detailed description of phenomena of interest in the organizational or institutional field, providing inputs for the conception of an explanatory theory for social facts. Still, in agreement with [20], it is not possible to understand one's own country without knowing the external experiences, that is, by comparing it becomes feasible to learn in detail the variables that influence the political, economic, and social context of a region.

The analysis performed aims to identify patterns in innovation procurement procedures according to the guidelines of the European Guide on Innovation Public Procurement 2021 [6], prepared with the aim of providing guidance on the concept, policy strategies, procedures and procurement criteria explaining why they are important, who are the stakeholders and how this process can be executed. The choice of this document is convenient, as it presents a very comprehensive scope of possibilities for adopting legal instruments, based on the trajectory of European countries, with consolidated practices at national and regional levels. There is no similar document at the regional level in Latin America that could be used as a reference. The adoption of the European Guide also allows the intra-regional comparison to be made from an inter-regional point of view, making it possible to analyze Latin American practices considering European practices.

The document presents three categories and eight procurement procedures favorable to innovation, as follows: the first category refers to contracts by negotiation, which can be carried out through the competitive procedure with negotiation or competitive dialogue; the second category refers to concession tenders, being executed from awards or service contracts; finally, the third category deals with public contracts for research and development, which can be implemented by contracts for RD&I services, assignment of intellectual property rights, pre-commercial procurement, and innovation partnerships.

To perform the comparative analysis, practices adopted in each of the five countries were identified, classifying them according to dimensions by the instruments used. Each content unit collected was classified according to the following dimensions: (i) laws and decrees dealing with written and formalized norms, (ii) guidelines that refer to documents that provide general instructions for public procurement and (iii) platforms that facilitate government procurement transactions online. As for data collection, the technique of structured analysis of government portals was used, which according to [21]:

> "Consists in performing inspections, automated or not, in selected portals to verify the existence and analyze, in an objective manner, the level of implementation of certain pre-established requirements, whether from the application of instruments already established in the literature, or from instruments specifically designed for the portals under study." [21]

The data was collected from inspections of the official government websites of each country, where news, laws, decrees and virtual platforms that were related to public procurement of innovation were collected. This was done using the following keywords: in Spanish "compras públicas de innovación + NAME OF THE COUNTRY", "contrataciones innovadoras + NAME OF THE COUNTRY", "innovación en compras públicas + NAME OF THE COUNTRY", in Portuguese "compras públicas de soluções inovadoras" and "compra pública de inovação". The application of these keywords to the searches on the government portals generated the content units that were analyzed and classified according to the description above. The conclusions of the analysis are presented in the Results and Discussions section, below.

5 RESULTS AND DISCUSSIONS

In the following table, it is possible to observe the data found concerning the structuring of public procurement of innovation in each country:

From the information found, it becomes possible to analyze in a comparative way the standard used in procurement procedures for innovation in each country considering as "good practice" guidelines the European Guide on Public Procurement for Innovation. In this sense, below we observe the types of contracts and procedures employed:

Given this general framework, it becomes practicable to make critical inferences about the procurement procedures for innovation adopted by each country according to the guidelines of the European Guide 2021. As such, it was sought to understand how the legal instruments (laws, decrees and guidelines) and the platforms used by the most innovative countries in Latin America direct the innovation procurement models. Below, the three types of contracts presented in the literature are discussed, and their use by the selected countries is analyzed.

5.1 Procedures with Negotiation

Public procurement for innovation with negotiation is characterized by the need to adapt solutions that are easily available on the market (including concession or innovative solutions) but are complex in nature. In these circumstances, the European Union rules point to two procedures: competitive procedure by negotiation or a competitive dialogue.

The competitive procedure with negotiation aims to give the procuring public body more flexibility in the process of awarding a contract, in case there are no ready-made solutions available on the market. Thus, it can be used when a similar process already exists that requires negotiations to adapt current conditions to develop an innovative solution. In summary, this model seeks to bring public purchasers closer to the industry, opening a direct dialog about the specific characteristics of the solutions to be developed.

As observed in Table 2, only Costa Rica and Uruguay adopt this criterion - it should be noted that both countries have specific and recent legislation for public procurement of innovative solutions, making national agencies responsible for the implementation and enforcement of the established rules. In the case of Costa Rica, article 23 of the Ley General de Contratos Públicos No. 9986 of 2021 establishes the guidelines for strategies and policies to promote the participation of small and medium-sized enterprises, ensuring the participation of the Ministry of Economy, Industry and Commerce (MEIC) in the entire contracting process. As for Uruguay, it is explicit in Decree No. 191 of 2019, starting in article 13, that the contracting entity must elaborate functional and technical specifications through a technical dialogue with the market to bring industry participation closer.

Competitive dialogue, on the other hand, is a two-stage public procedure in which the needs are first described in a call for proposal, setting out the minimum requirements for participation and defining the criteria for awarding the contract based on the best value for money. Then, after verifying the selection criteria for the candidates, the contracting authority initiates the competitive dialogue with the participants, negotiations are carried out

Table 1: Comparative Overview of Public Procurement Policies for Innovation in Latin America

Country	Dimensions		
	Laws and Decrees	Guidelines	Platforms
Chile	It was not found a legal regulation that specifically established an mechanism for public procurement of innovation, but rather regulations that deal with incentives to strengthen the system of science, technology and innovation in the country. Still, it is important to point out the Ley de Bases sobre Contratos Administrativos de Suministro y Prestación de Servicios 19.886 of 2003 [22], which provides norms for administrative supply and service contracts.	Directiva de Innovación para las Compras Públicas: ¿Cómo podemos innovar en el proceso de compra pública? [23] Document formulated in 2018 by a public consultation aiming to stimulate the practice by public bodies.	ChileCompra [24], is a transactional platform that brings together the demand of public agencies and the supply of various suppliers. Instituted by the Law N0 19,886 of 2003.
Mexico	It was not identified a specific legal apparatus regulating public procurement of innovation, but normative provisions from the Ley de Adquisiciones Arrendamientos y Servicios del Sector Público (LAASSP) of 2000 [25] with mechanisms to support micro, small or medium enterprises that produce goods with technological innovation.	It was discovered the National Innovation Program of 2011 [26] that brings tools for the execution of innovative public procurement.	CompraNet [27], system in which public e-government information on procurement is made available. Established in May 2009.
Costa Rica	Ley General de Contratos Públicos No. 9986 of 2021 [28], which establishes from article 20 to 22 strategic public procurement to promote innovation, incorporating social, economic, environmental and innovation aspects, and finally the establishment of Innovative Public Procurement. In addition, there is the Executive Decree No. 43808- H of 2022, which presents rules for the implementation of innovative and strategic procurement throughout the country.	No guidelines related to Public Procurement of Innovation were found beyond the cited Law and Decree.	SICOP [29] (Integrated Public Procurement System), a website on which purchasing and contracting processes are carried out with public institutions. Implemented in 2015 by decree 37943-H-MICTT.
Brazil	Nova Lei de Licitações e Contratos No. 14.133 of 2021 [30], which determines the objectives of bidding processes to encourage innovation and sustainable national development. Lei Complementar No. 182 of 2021 [31] establishing the Legal Framework for Startups and Innovative Entrepreneurship, which in its 12th article establishes the Public Contracting of Innovative Solutions.	No guidelines related to Public Procurement of Innovation were found beyond the cited Law and Decree.	Inova CPIN [32], public procurement platform for innovation established by the Federal Audit Court in 2022.
Uruguay	Decree No. 191 of 2019 [33] regulating art. 43 of Law 18.362 of 2008 [34], which provides for the creation of the Public Procurement Program for Scientific-Technological and Innovative Development under the coordination of the National Agency for Research and Innovation. It established the regime and special contracting tools to promote the development of national suppliers, in particular, micro, small and medium enterprises.	Manual de Contratación Pública [35] directed by the State Procurement Regulatory Agency that contains all aspects of public procurement that serves as a guide for contracting entities.	No specific platform for innovative public procurement was located, but it is important to highlight the computer system for managing and publishing the annual procurement plans of state agencies, ARCE (gub.uy). [36]

Source: Elaborated by the authors.

individually with each candidate to ensure the confidentiality of each solution.

From the data collected, it is noted that only Brazil adopts this contracting procedure from article 28 of Law No. 14,133 of 2021, used mainly for contracting works, services and purchases in which the Public Administration conducts dialogues with bidders previously selected through objective criteria, in order to develop one or more alternatives capable of meeting its needs, and the bidders must submit a final proposal after the closure of the dialogues.

Table 2: Type of Contracts and Procedures used by Country

Type	Procedures	Chile	Mexico	Costa Rica	Brazil	Uruguay
Procedures with Negotiation	*Competitive Procedure by Negotiation*			X		X
	Competitive Dialogue				X	
Design Contests	*Rewards*				X	
	Provision of Services	X	X	X	X	X
Procuring Research and Development	*Allocation of Intellectual and Property Rights*	X	X	X	X	X
	Pre-Commercial Procurement	X	X	X	X	X
	Procuring Research and Development Supplies			X	X	X
	Innovation Partnership	X	X	X	X	X

Source: Elaborated by the authors.

5.2 Design Contests

The design contests are defined by the award of works in the fields of urban planning, architecture, engineering and data processing. Contests for design work may be organized using prize awarding (with payment) or service contracts.

The method of competitive bidding through the awarding of prizes or remuneration to the winners depends on the criteria in the public call for tenders. In this scenario, again only Brazil makes use of this procedure, through article 28 of Law No. 14,133 of 2021, which determines the bidding modality for the choice of technical, scientific or artistic work from the awarding of a prize or remuneration to the winner.

On the other hand, contracts for the provision of services are the most traditionally used, dealing with the acquisition by the public administration of any type of goods, works, or services that result in the purchase of innovative ideas. Thus, this is contemplated by all the countries analyzed composing even similar legal procedures from the evaluation of the proposals aiming to identify the usability, suitability, ergonomics and artistic, reputable or innovative qualities of the proposal.

5.3 Procuring Research and Development

Research and development contracts are intended to develop a customized innovative solution. According to the European Commission's 2021 Guide, it occurs when the market does not offer a satisfactory solution or when an adaptation of existing solutions does not meet the bidder's needs. As such, it is widely used as a public procurement strategy for innovation, as it plays a relevant role for local economies by bringing a new state-of-the-art solution to the market or by adopting an innovative solution.

The assignment of intellectual property rights deals with how the intellectual property rights of the adopted solution are established by the public authority and how this impacts the procurement model. If the public procurer retains the intellectual property rights, it may decide to use the innovative solutions resulting from the research. It is also possible that the public authority may decide to grant free licenses for the new intellectual property rights to all interested parties, with the aim of stimulating further innovation, or decide to assign the new intellectual property rights to the supplier. In this scenario, even countries that do not have specific legislation on public procurement of innovation, such as Chile and Mexico, have clear regulations on the assignment of intellectual property rights in the public procurement process.

Pre-commercial procurement aims to contract research and development services on advantageous terms to various economic operators. Thus, the buyer finances the research and development phase of new technologies or products, enabling companies to test them and refine their solution. Being available since 2007, it is also one of the most used and traditional procedures in public procurement of innovation, which can be observed by the adoption of all the countries analyzed.

The research and development supply contracts include the acquisition of prototypes, or the first products/services developed together with the public authority. From Table 2, it can be observed that only the countries with specific regulations for public procurement of innovation adopt this procedure. The laws of Costa Rica, Brazil and Uruguay make clear in their dispositions the promotion of innovation from the investment and promotion of universities, industries, companies and even civil society organizations. This is evidenced in Article 22 of Costa Rica's Law N°9.986/21, which establishes the public-private association for the development of research projects and/or technological innovation consisting in the development of prototypes for research, experimentation, study or original development. In the case of Brazil, Complementary Law No. 182/21 in Section IV, Chapter VI establishes the contracting of innovative solutions, technology supply and investments in research. Uruguay, on the other hand, in Decree No. 191/19, in its 3rd article, determines the contracting of research and development services (R&D), including the prototyping phases and the first production tests.

And finally, the partnership for innovation is a procedure used in cases where there is no solution in the market for the needs of the acquiring public, its main characteristic is that innovation occurs during the execution of the contract, being adopted by all the countries analyzed. Although Mexico does not have specific legislation for public procurement of innovation, the Ley de Adquisiciones Arrendamientos y Servicios del Sector Público (LAASSP) of 2000 points out mechanisms to support micro, small and medium enterprises in the production of goods with technological innovation. In the case of Chile, the Directorate of ChileCompra has established guidelines for public purchasers of the steps to be followed

to execute innovation partnerships, dividing between the following stages: planning, exploration, definition, call, validation and follow-up.

6 CONSIDERATIONS

The present paper aimed to answer which procurement procedures for innovation are adopted by the countries ranked as most innovative in Latin America. Based on the contributions of the literature, especially shown in [7], [8], [9], [10], [5], [11] [15] central issues of the scenario of innovation policies in Latin America were addressed. Among these, was highlighted the contribution of the adoption of public procurement models for innovation to promote technological development and national sovereignty that according to what PLACTS advocates can establish national goals of public policies for innovation considering the social, cultural and economic context of Latin America [14]. This approach also proved useful to support the analysis that Latin American countries have innovation practices that despite being distinct promote not only the efficiency of public services, but also national economic development. Afterwards, the methodology of comparative perspective analysis was employed to elaborate an analytical framework about the public procurement procedures of innovation in the set of selected countries.

The European Guide proved to be an appropriate reference to orient the analysis of the specific cases, by allowing an understanding of central elements of the public procurement models for innovation in each country. In general, it was possible to observe that the countries with specific legislation for implementing public procurement for innovation include most of the procedures indicated by the document, being Costa Rica, Brazil and Uruguay. Meanwhile, Chile and Mexico only present directives and directions for the practice public procurement of innovation, containing the most adopted procedures, being the contracts that encourage Research and Development from pre-commercial procurement and by innovation partnerships. All countries have developed virtual platforms for public procurement, whether traditional or innovation, which is already an indication of preparation of the public environment for receipt of products, services or goods aimed at innovation.

Furthermore, it points to the need to observe which other countries in Latin America and the Caribbean that are not ranked have public procurement practices for innovation that can be international success cases, since the ranking does not determine the best science, technology and innovation policies adopted by each government. Among the limitations of the research, there is the possibility that, residually, some normative instrument was not captured by the methodology employed. Considering that these resources are important for the regulation of the innovative procurement process, the improvement of data collection techniques, including the use of automated resources, can provide greater accuracy to the result.

The research did not attempt to analyze the actual use of the dimensions of the instruments identified. Two paths for future research open here: a first path, predominantly quantitative in nature, can collect data on the performance of procurement activities based on the innovation procurement mechanisms, allowing analyses on their level of adoption and on their economic impacts. The second improvement path is mostly qualitative, with the realization of national case studies that allow interpretative analyses about the process of construction, implementation and adoption of the procedures, including conflicts, resistance and strategies of relevant actors (suppliers, research centers, bureaucracies, public leaders, etc.).

The dynamics of technological transformations may, in the near future, also work as a conditioning factor for the evolution of the models presented and the emergence of new ones. To accompany these developments, considering their technological aspects and foundations, may be opportune. To conclude, it is highlighted the importance of future research with interdisciplinary approaches in interpreting the innovation systems of each Latin American nation and also of studies on new international standards of public procurement procedures for innovation, since it is relevant to consider the context of each nation to understand the policies adopted.

REFERENCES

[1] Pedro Cavalcante, Bruno Queiro Cunha. 2017. É preciso inovar no governo, mas por quê? Inovação no setor público: teoria, tendências e casos no Brasil. IPEA, Brasília, 15-32. https://repositorio.ipea.gov.br/handle/11058/8785.

[2] Rainer Kattel, Erkki Karo. 2016. Start-up governments, or can Bureaucracies innovate? Ineteconomics. Retrieved from: https://goo.gl/cxV5kL.

[3] Mariana Mazucato. 2013. The Entrepreneurial State: debunking private vs. Public sector myths. London: Anthem Press.

[4] OECD. Compendium of Good Practices for Integrity in Public Procurement. Paris. https://is.gd/8ivlYE.

[5] Justyna Pozarowska. Magdalena Olejarz. 2020. Public Procurement of Innovation. Public Procurement Office, 6 -17. Retrieved from https://www.uzp.gov.pl/data/assets/pdf_file/0017/45503/Zamowienia_publiczne_na_innowacje_EN_WCAG-2021-01-12.pdf.

[6] European Commission 2021. Guidance on Innovation Procurement. 57 -69. Retrieved from https://ec.europa.eu/docsroom/documents/45975.

[7] Paul Andrew Geroski. 1990. Procurement Policy as a Tool of Industrial Policy. International Revier of Applied Economics, 182 -198. https://doi.org/10.1080/758523673.

[8] Robert Dalpé. 1994. Effects of Government Procurement on Industrial Innovation. Technology in Society, 65 -83.

[9] Charles Edquist. Leif Hommen. 2000. Public Technology Procurement and Innovation Theory. Public Technology Procurement and In novation. Springer US 5-70. DOI 10.1007/978-1-4615-4611-5.

[10] Leif Hommen. Max Rolfstam. 2009. Public Procurement and Innovation: Towards a Taxonomy. Journal of Public Procurement, 17 -57. Retrieved from http://ippa.org/jopp/download/vol9/issue-1/Art2_TowardsaTaxonomy.pdf.

[11] Charles Edquist. Jon Mikel Zabala-Iturriagagoitia. 2020. Functional Procurement for Innovation, Welfare, and the Environment. Science and Public Policy, 595-602. https://doi.org/10.1093/scipol/scaa046.

[12] Benoît Godin. 2006. The Linear Model of Innovation: The Historical Construction of an Analytical Framework. Science, Technolo gy and Human Values, 639-667. 10.1177/0162243906291865.

[13] Stephen Jay Kline. Nathan Rosenber. 1986. An Overview of Innovation. The Positive Sum Strategy: Harnessing Technology for Economic Growth, National Academy Press, 267-307.

[14] Renato Dagnino. Hérnan Thomas. 2001. Planejamento e Políticas Públicas de Inovação: Em Direção a um Marco de Referência Latino-Americano. IPEA, Brasília, Planejamento e Políticas Públicas, 205 -231. Retrieved from https://www.ipea.gov.br/ppp/index.php/PPP/article/view/76/86.

[15] Paulo Gomes Lima. 2009. Política Científica e Tecnológica: Países Desenvolvidos, América Latina e Brasil. UFGD, Dourados, 77 -89. Retrieved from https://repositorio.ufgd.edu.br/jspui/bitstream/prefix/2269/1/politica-cientifica-e-tecnologica-paises-desenvolvidos-america-latina-e-brasil.pdf.

[16] Daniel Lederman. Julián Messina. Samuel Pienknagura. Jamele Rigolini. 2014. Latin American Entrepreneurs: Many Firms but Little Innovaton. World Bank Latin American an Caribbean Studies, 1 -56. Retrieved from https://www.worldbank.org/content/dam/Worldbank/document/LAC/LatinAmericanEntrepreneurs.pdf.

[17] Marina Figueiredo Moreira. Eduardo Raupp Vargas. 2009. O papel das compras go vernamentais na indução de inovações. Contabilidade, Gestão e Governança, 35-43. Retrieved from https://revistacgg.org/index.php/contabil/article/view/66/pdf_59.

[18] OECD. 2017. Public Procurement for Innovation: Good Practices an Strategies. OECD Public Governance Reviews, Paris, 27 -85. https://doi.org/10.1787/9789264265820-en.

[19] Bertrand Badie. Guy Hermet. 1993. Política Comparada. México: Fondo de Cultura Económica. 1993.
[20] Giovvani Sartori. 1994. Comparación y método comparativo. La Comparación en las Ciencias Sociales. Madrid: Alianza Editorial.
[21] Matheus Ricardo. Manuella Maria Ribeiro. José Carlos Vaz. 2018. Strategies and Instruments for the Dissemination and Promotion of of Opengovernment Data use in Brazil: Case Study of Rio de Janeiro City Hall. Revista Tecnologia e Sociedade. 10.3895/rts.v14n33.6866.
[22] Chile. Biblioteca del Congresso Nacional. Ley de Bases sobre Contratos Administrativos de Suministro y Prestación de Servicios 19.886 of 2003. Retrieved from https://bcn.cl/2f72u.
[23] Chile. Laboratorio de Gobierno. Dirección ChileCompra. ¿Cómo Podemos innovar en el proceso de compra pública?. Retrieved from https://www.lab.gob.cl/uploads/filer_public/cd/9b/cd9b06e6-ccf8-48d4-8e8a-0a380d804b98/directiva_compra_publica_innovadora.pdf.
[24] Chile. ChileCompra. Retrieved from https://www.chilecompra.cl/.
[25] Mexico. Camara de Diputados del H. Confresso de la Unión. Ley de Adquisiciones Arrendamientos y Servicios del Sector Público de 2000. Retrieved from https://www.diputados.gob.mx/LeyesBiblio/pdf/14_200521.pdf.
[26] Mexico. Comité Intersectorial para la Innovación. Programa Nacional de Innovacíon. 2011. Retrieved from http://www.2006-2012.economia.gob.mx/files/comunidad_negocios/innovacion/Programa_Nacional_de_Innovacion.pdf.
[27] Mexico. Hacienda. Plataforma Integral CompraNet. Retrieved from https://compranet.hacienda.gob.mx/web/login.html.
[28] Costa Rica. Procuraduría General de la República. Ley General de Contratación Pública 9.9986 de 2021. Retrieved from http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1$=$NRTC&nValor1$=$1&nValor2$=$94469.
[29] Costa Rica. Sistema Integrado de Compras Publicas SICOP. Retrieved from https://www.sicop.go.cr/index.jsp.
[30] Brasil. Presidência da República. Lei de Licitações e Contratos Administrativos 14.133 de 2021. Retrieved from https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2021/lei/l14133.htm.
[31] Brasil. Presidência da República. Lei Complementar 182 de 2021. Retrieved from https://www.planalto.gov.br/ccivil_03/leis/lcp/lcp182.htm.
[32] Brasil. Governo Federal. Inova CPIN. Retrieved from https://inovacpin.org/.
[33] Uruguay. Centro de Información Oficial. Decreto 191 de 2019. Retrieved from https://www.impo.com.uy/bases/decretos/191-2019.
[34] Uruguay. Centro de Información Oficial. Ley 18.362 de 2008. Retrieved from https://www.impo.com.uy/bases/leyes/18362-2008.
[35] Uruguay. Agencia Reguladora de Compras Estatales. Manual de Contratación Pública. Retrieved from https://www.comprasestatales.gub.uy/ManualesDeUsuarios/manual-procedimiento-compras/Manual.html.
[36] Uruguay. Agencia Reguladora de Compras Estatales. ARCE gub.uy. Retrieved from https://www.gub.uy/agencia-reguladora-compras-estatales/.