Paakat
Revista de tecnología y sociedad

# The State as a smart consumer to carry out public procurement of innovation

# *El Estado como consumidor inteligente para efectuar adquisiciones públicas de innovación*

http://dx.doi.org/10.32870/Pk.a11n20.532

Received: April 22, 2020
Accepted: October 30, 2020

Carlos Ortega-Laurel*
http://orcid.org/0000-0001-6072-8480
Universidad Autónoma Metropolitana, Mexico

## ABSTRACT

This article analyzes the need for the State to make purchases with the help of electronic government, which is based on innovation and development policies, factors that would make it a smart consumer. This paper presents the evolution of purchasing models, from version 0.0 to version 4.0, as a reference framework to identify and self-determine the current state of any government entity in this area. Knowing the current point in which State purchases operate allows to devise and find improvements in the procurement models so that they are oriented and transform the requirements of the 4.0 procurement model, which enables progress towards the desired public procurement of innovation, with which would initiate a demand for products and services in an intelligent way.

**Keywords**
Electronic government; 4.0 purchases; public innovation purchases; information and communication technologies for procurement management

## *RESUMEN*

*Este artículo analiza la necesidad del Estado de realizar compras con el auxilio del gobierno electrónico, que se basa en políticas de innovación y desarrollo, factores que lo convertirían en un consumidor inteligente. En este trabajo se presenta la evolución de los modelos de compras, desde su versión 0.0 a la versión 4.0, como marco de referencia para identificar y autodeterminar el estado actual que guarda cualquier ente de gobierno en este rubro. Conocer el punto actual en el que operan las compras del Estado permite idear y encontrar mejoras en los modelos de adquisición para que estos se orienten y transformen los requerimientos del modelo de compras 4.0, que habilita el progreso hacia las anheladas compras públicas de innovación, con lo que iniciaría una demanda de productos y servicios de forma inteligente.*

***Palabras clave***
*Gobierno electrónico; compras 4.0; compras públicas de innovación; tecnologías de la información y la comunicación para la gestión*

* Bachelor, master and doctor in Communications and Electronics from the Instituto Politécnico Nacional, Mexico. Degree in Law from the Universidad del Valle de México. Master in Business Administration from the Universidad Nebrija, Spain. PhD in Business Administration from the Universidad de Negocios ISEC. Professor-researcher of the Department of Information Systems and Communications from the Universidad Autónoma Metropolitana, Lerma Unit, Mexico.

## Introduction

Since the emergence of e-government in the 1990s, the State has sought to learn about, use and integrate information and communication technologies (ICTs) in the different activities that are used to address the powers and responsibilities of the three levels of government (municipal, state and federal) and the three branches of government (Executive, Legislative and Judicial). Flores (2011) says that in several reports on the modernization of the State issued by multilateral organizations –such as the United Nations (UN) and the Organization for Economic Cooperation and Development (OECD)– they urge governments to

> develop and implement e-government initiatives with the objectives of simplifying processes, improving productivity, increasing transparency, reinforcing good governance, improving coordination and communication within government institutions, improving the quality of services, increasing the effectiveness of policies and improving citizen trust in government, and broadening participation (p. 3).

In general, government procurement has been one of the processes that has made it possible, to a greater extent, to internalize the use of ICTs to achieve the so sought-after e-government. This is due to the fact that, as is evident,

> in the global sphere, governments have become the largest purchasers of goods and services, transforming public procurement into a fundamental instrument in the design and implementation of policies for income redistribution, support for industrial sectors and job creation. For example, through the Small Business Act, the United States establishes fixed percentages of public procurement for small businesses and specific population groups. On an international scale, the relevance of the public procurement market is widely recognized and the magnitudes traded justify its inclusion in trade agreements (Gómez and Nieto, 2006, p. 2).

Likewise, the authors point out that in the study The Size of Government Procurement Markets, carried out by the Organization for Economic Cooperation and Development in 2001, "the participation of government procurement in the total of goods and services traded internationally during 1998 was estimated at 82%. In OECD countries, government procurement represented 19.9% of GDP (gross domestic product), while in the group of non-members this percentage was 4.4%" (Gómez and Nieto, 2006, p. 2).

This is reinforced by the research of Bezchinsky and López (2012), who say that public procurement, by encompassing a high number of transactions, represents a substantial portion of GDP in most countries of the world. According to the World Trade Organization (WTO) –the authors say– government procurement represents between 10% and 15% of the world's GDP, which is why performance of the public procurement system is key for any economy (p. 2).

Since public procurement in OECD countries represents between 14% and 20% of GDP (Gómez and Nieto, 2006, p. 2), its potential as an instrument for development is

undeniable. Procurement can be misused and weak, or, on the contrary, it can be used correctly by taking advantage of e-government.

It is assumed that every nation or entity makes purchases internally, which means that each one has a powerful political instrument that exercises a high percentage of GDP (Rozenwurcel and Drewes, 2012); therefore, it is plausible to ask why this exercise is not given a strategic vision, in such a way that it represents an injection directed to the economic activity to be developed. In this context, procurement becomes a transforming and strategic instrument with different purposes, aspects and nuances to be drawn from the vision of the nation state proposed by governments.

This vision may contemplate, for example, the search for sustainability (advancing in the area of green procurement), social development (through differentiated purchases that support companies that contribute to social programs), or the strengthening of innovation (by directing purchases to ideas, objects or inventions that generate mechanisms to consolidate government action and control).

Government procurement has always been a sensitive issue, regardless of whether it is managed through electronic platforms or not. In order to perform properly, it requires extensive negotiation skills and seasoned knowledge of the support of public procurement, legislation, spending and investment budgets, items, deadlines and ceilings for specific contracting procedures, among other matters.

It should be noted that the subject of procurement usually gives rise to a great deal of controversy, due to the fact that large investments are made, especially when technology is purchased, whose contracts, unfortunately, do not always translate into tangible benefits for citizens and taxpayers. Due to the relevance of the government procurement process, this paper explains how it has evolved over time, derived from the involvement and use of ICTs.

This article presents a procurement treatise, or reference model to determine the level of maturity, which can become a model to be followed to evaluate these governmental processes –taking into consideration that not all government agencies have evolved in unison–. This instrument will allow any entity of the three orders of government, branches of the union or any other entity, to generate self-diagnoses that help to identify where their weak points are, with the intention of elaborating plans and prospective with a view to consolidating public procurement of innovation through e-government.

## Development

At this point, and before describing procurement models, it is relevant to point out what the two types of purchases made by governmental entities are: of exchangeable products and services, and of unique products and services. In the case of purchases of exchangeable products and services, the aim is to exercise purchasing power over the product or service, which raises a series of requirements and considerations that do not go much beyond taking into account exchangeable or irrelevant characteristics.

Due to the search for efficiency in the transaction, this type of exchangeable products and services allows the purchase in volume; however, the reality is that each governmental entity, having different needs, decides what to buy and in what amount or quantity. Clearly, this can lead to overpricing, inefficiencies and isolated actions, which can generate various problems in terms of the real benefit obtained from budgets.

On the other hand, there are unique products and services that cannot be purchased by just any company or institution. For this type of non-exchangeable acquisitions, the State is limited to conducting negotiations –to deal with the quasi-monopoly issue–, to obtain a specific supplier or, failing that, to generate the infrastructure and knowledge necessary to produce that product or service within its territory.

Taking into consideration this difference in products and services makes it possible to investigate the limitations or opportunities of each purchasing model in the procurement process.

To understand the procurement process, a brief review of the five stages of evolution of procurement models (from .0 to 4.0 procurement) is necessary. The transformation in the models and the ways of conceiving and performing procurement are advancing with the use of ICT, which, in general, goes parallel to the evolution and adoption of e-government.

*Procurement 0.0*

Procurement under the 0.0 procurement model (also known as the disconnected model) are those carried out without the use of any type of ICT-based means that systematizes or automates the operations of the procurement procedure, i.e., the purchase, the contractual execution and the client-supplier relationship. In these cases, procurement, which seeks to satisfy the demand for products or services of the State entities, is achieved using entirely manual systems; the processes and procedures, as they are normed and regulated, do not make use of “automatic” tools, nor do they incorporate any kind of cutting-edge technology or techniques (Zabala-Iturriagagoitia, 2012; Comotto and Meza, 2015; Abusleme, 2016).

In this model, both purchases –of exchangeable and non-exchangeable– may have certain problematic issues due to the shortcomings in the logistics of the transaction

processes they carry. This, it could be hypothesized, would be related to the fact that the manual processes they use are of an "unstable" nature, and do not consider any type of innovation or improvement that, for example, could bring the use of technology in management processes.

*Procurement 1.0*

A first advance to the already described Procurement 1.0 is the introduction of electronic platforms to carry out procurement procedures. Rodríguez (2014) states that procurement 1.0 is the "management mode of state procurement and contracting procedures that allows, through an electronic platform, the presentation, reception, opening and access to bids" (p. 82).

In this model, the transaction is made through an electronic platform; that is, the same purchase of the 0.0 model is made to solve the need for products/services that the State has, but making use of ICTs to execute the usual management, and without seeking a purpose of value for innovation. While there is no doubt that the process or management is streamlined with the use of ICTs, by optimizing time, in general terms the innovation demand strategy remains null; beyond the systematization represented by the use of programs or software, these do not provide a concrete benefit of invention.

According to Rodríguez (2014), in this model a strategy has been undertaken to "automate procurement procedures, from the publication of the call for tenders to the opening" (p. 82). However, despite being referred to here as "automation", it is considered to represent at most a systematization.

With this first wave of including technology in the processes, some benefits are obtained, such as the simplification of procedures, the reduction of time and costs, and the reduction of costs for bidders, in addition to allowing greater transparency and better access to information by the public regarding the procurement processes.[1]

In this way, acquisitions based on the 1.0 procurement model continue to be "only by inertia", since for the State obtaining goods and services is something necessary, without seeing any benefits beyond those listed, leaving aside the benefits in terms of demand for innovation that can be achieved through the intensive use of information systems.

*Procurement 2.0*

The second wave in the evolution of procurement lies in the execution of acquisitions through technological platforms with a defined strategic objective (Zabala-Iturriagagoitia, 2012; Comotto and Meza, 2015; Rodríguez-Porrero and Gil, 2014; Toloza and Caniuqueo,

2019; Trujillo and Tello, 2019). In the 2.0 model, the use of ICTs seeks to attack problems that go against procurement efficiency, facilitate the aggregation of demand from the various government entities (on the largest possible scale), the search for better prices and the implementation of contracts. In addition, with the system modules, the entire procurement procedure can be made public and transparent (Díaz, 2019).

The procurement 2.0 model is used by government entities as part of their public policies, since through procurement they seek to promote mechanisms to achieve particular strategic objectives. In fact, the object to be achieved is addressed in the technological platform(s), providing visibility and systematization to the process, regardless of the objective pursued (e.g., avoiding corruption).

This model contributes to the normal use of ICTs in the procurement process, thus obtaining a public benefit and achieving specific objectives –although this is not always a conscious intention, it ends up occurring incidentally, to a greater or lesser extent–. Procurement 2.0 visualizes the need to interconnect; there is a first boom in the procurement of information technologies and electronic platforms, with the specific purpose of assisting in the management of processes.

*Procurement 3.0*

The third model includes systems that process and manage purchases, provide traceability to procedures (with or without a specific object) and add tracking to the procurement life cycle. These purchases obtain data to feed the "intelligence" of the process through electronic platforms. Likewise, in this model it is imperative to have procurement modules, which have the function of organizing the procedures, obtaining statistical information that provides follow-up and feedback to the process, concentrating the operations at the moment of the execution of the purchases and of the contracts that derive therefrom, and keeping a historical record thereof.

These systems, in addition to enabling traceability and monitoring of the operation (Beláustegui, 2011; Zabala-Iturriagagoitia, 2012; Rodríguez-Porrero and Gil, 2014; Villacís, 2019), must be capable of concentrating actionable statistical data. By linking operating systems, it becomes feasible to know which are the best suppliers, who deliver on time and on budget, who have defaulted, which have better quality and price, and what are the historical amounts of contracts (in the last fiscal year, in a biennium, triennium, etcetera). Thus, this model allows to have complete control of the procurement cycle.

*Procurement 4.0*

This archetype not only manages and provides traceability to procedures (Martinez and Torres, 2019; Filer, 2020), but also monitors strategies that make use of ICTs to achieve the promotion of public policies or innovation. These systems are called innovation procurement systems (Zabala-Iturriagagoitia, 2012; Saldaña, 2014; Abusleme, 2016; Eizaguirre, 2016; Del Carmen *et al.*, 2019; Peralta, 2019), and are visualized for addressing strategies such as making environmentally friendly purchases (Sánchez, 2019), being socially and environmentally responsible, being ecological and sustainable (Bortagaray, 2019).

Procurement 4.0 makes it possible to create new products, services and innovations (since these platforms can be used to draw up strategies for local companies to develop non-existent goods and services), and allows a given State or government to decide what it wants to develop. With the use of information systems based on ICTs, the 4.0 model seeks to generate procurement engines directed through information systems or electronic platforms that make it possible to elucidate and monitor certain indicators (some of them even in real time).

This model proposes the use of public procurement as an engine of the economy, since, supported by the potential of ICT-based information systems (Guadarrama, 2017; Aguirre, 2019), it enables a mechanism for the transformation of the organizations themselves (Rozenwurcel and Bezchinsky, 2007; Maza, 2019). As it is a powerful instrument that promotes the development of health programs, SMEs, the ICT sector itself –such as the software industry–, among other areas, if this model is able to permeate the State, it would generate a boost to the development of innovations demanded by citizens, thanks to the schemes supported by e-government for public procurement.

In order to reach procurement 4.0, it is not only necessary to work from the procurement areas or from the concentrations linked to govern efficiency (Suárez, 2019), it is also necessary to do it through procurement in which industrial production, innovation and social policies can be promoted (Bortagaray, 2016). This from the needs of the government, from the political, economic, social or technological aspect, and certain locks that can serve to promote other aspects, such as gender equity or the creation of local businesses.

However, it is important to remember that there are issues not inherent to procurement that are related to the specialization of the purchase, since not all of them can be done centrally –because it is not the same technologies that are required for health, security, transportation, environment or energy creation–, and, therefore, there must be visualizers or problem developers in charge of conceptualizing, visualizing and anticipating what will be required.

An example of this is to think of a policy that incorporates women into the labor market and involves them in productive activity. Job creation strategies can be developed

through procurement, or the exercise of budgets. Procurement can dictate a policy to favor, in a certain way (by means of weightings in the institution's evaluation criteria, for example), that companies incorporate women in their work teams, an issue that can be monitored through technological platforms (provided that the government has a clear objective, a mechanics of how purchases are directed and a follow-up mechanism-indicator).

Thus, the policies applied to procurement will be visualized as a trigger for innovation, industry or entrepreneurship (Schteingart, 2016). This evolution of procurement processes can be seen by observing the case of the United States, whose industry has developed based on public procurement programs for innovation, using it as a tool since the 1960s to promote the development of the 4.0 model in the pursuit of innovation and transformation (Gómez and Nieto, 2006).

## Discussion

For many people, planning and executing public purchases of goods and services, especially ICT or technology in general, are a window to corruption, since budgets of millions of pesos are allocated and raise suspicions. In view of this, this paper shows that the procurement exercise does not have to be viewed in this way, as there is a positive potential in these purchases. The use of ICT-based electronic platforms makes it possible to change that thinking and make the potential for leveraging investment and spending –represented by purchases as a percentage of the GDP of the three orders of government and the three branches of government– be channeled in a positive way for the good of society in general.

In order to unleash government technology procurement as a force for innovation in the country, not only within the government itself but also in the entire market, it is desirable that government entities reach the level of maturity outlined by the 4.0 procurement model and use technological platforms. In this sense, in order to advance in this direction, the State must first recognize the power and potential of this model to request, demand, require, demand and purchase disruptive and transformative technology.

Perhaps the beginning of innovation is to demand that the State change its own procurement procedure, its operation, its intelligence and the indicators for monitoring the public policies it deems to be important. The State, from its very privileged position as a large consumer, can be suggested to act as an ingenious buyer, capable of negotiating with strategy, with one or more intentions, that is, to act as an intelligent consumer whose capacity and ability lies in ICT systems that allow it to make informed decisions.

It is likely that many of the purchases are still made through the 0.0, 1.0 and, at best, 2.0 models; but this can be changed in stages, at a rapid pace, always adopting the considerations that are imposed as necessary. Technology procurement officers, in the

general context of the word, are the representatives of society who must have the highest level of technological ideation, so that they are in a position to demand disruptive and transformative innovations for society as a whole. They must be visionaries in this field and be able to reveal the impediments not only technological but of the legal, political, economic and social environment in the whole context.

Even so, if the proposal is to be adopted as a State public policy, it is feasible that, with a view to implementing the 4.0 procurement model, the National Development Plan will provide the guideline for the acquisitions that will give rise to disruptive and transformative technology to be managed through the 4.0 procurement model and become the catalysts that promote government transformation, thus creating the framework of the State as an intelligent consumer. In this way, with the use of the 4.0 model, public procurement can push the frontier technology to obtain functionalities, features and technological advantages that are not yet usually available in the market, and make the government a smart consumer that demands innovation rather than investment.

It is time to appropriate innovative technology, driven by government demand for the benefit of taxpayers and society, who are the people ultimately responsible for paying for everything that is done in terms of spending-investment. Today it is clear that the implementation of disruptive electronic platforms of great importance in public management is very complex, especially at the national level, not only in the procurement process but in any public management process.

Here these questions arise: what happens with this digital transformation process that has to reach the public sector? why does it take fifteen years or more for a technology to be adopted by the State? –An example of this could be the Internet of Things (IoT) or artificial intelligence (AI) technology–. In the search for an answer, it is possible to go beyond procurement models (from 0.0 to 4.0), since it is feasible to point out that many buyers are unaware that they have a high responsibility in the matter, since it is clear that no one who does not know about innovation or without innovative knowledge can acquire technology.

Those who make and decide on purchases must know about this subject, about the models and technological platforms in which they operate, as well as about technology. This makes it necessary to train personnel, since people who use and understand technology are needed to find the answers to problems. In order to measure the importance of training and professionalization of human capital, it is essential for any of the purchasing models to prosper, especially those that make intensive use of electronic platforms and are committed to innovation.

In this way, education programs on procurement and smart consumption can be created by generating links with universities and professional associations. In short, it is a matter of developing the necessary skills in the officials who will have the difficult task of

carrying out smart technology procurement –as a force for innovation in the country– and of ensuring the execution of creative and rapid procurement decisions.

It is clear that, in order to make the best purchases, diagnostics must first be generated through impact, performance and evaluation indicators. Certainly, in order to achieve full awareness of the process, electronic platforms and accounting and management programs are required to organize information and facilitate calculations, as is suggested by the 4.0 model.

In this way, technology purchases should be given an explicit position of power to demand innovative technology. Senior government executives in the field should be involved in capitalizing on the information and be attentive to the indicators that the processes of purchasing this technology produce.

## Conclusions

This article has described the evolution of public procurement models that have been implemented with the increasingly frequent use of electronic platforms, which seek to obtain the greatest possible benefit from information and communication technologies. The models have been characterized in such a way that they can be considered as benchmarks for identifying the transformational and strategic innovation potential of procurement.

The data and information generated through the 4.0 model for the execution of procurement through e-government platforms, which, with the use of ICTs, allow the State's purchasing power to be leveraged, can be especially appreciated. Undoubtedly, this strategy can leverage development and innovation beyond procurement itself, towards open innovation models, both in the public and private spheres.

The search for and achievement of innovation will be given traceability through the exploitation of data and nodal information; this fact points to revaluing the use of imagination to induce the making of more ingenious, efficient, ecological and safe products or services, which introduce new paradigms for development not only for the State, but for citizens in general.

ICT-based electronic platforms, applications and information systems enable the same government purchasing power to be used to create higher quality and more efficient markets, with reduced secondary or external costs for government, business, the economy, consumers and taxpayers.

It is very likely that taxpaying citizens will return trust to governments in the execution of acquisitions through the 4.0 model to purchase innovation in goods, services, inputs, technology and creations in general that benefit society as a whole.

In closing, the need to establish a government procurement observatory is raised. This is because the different government entities should monitor their progress in the promotion and use of innovative technologies or platforms. In addition, they should improve their efforts to report on projects, document success stories and how the results of these can be applied in other areas. The same suggestion would provide a solid basis for institutionalizing the monitoring, evaluation and improvement of procurement in general, and public procurement of innovation in particular. With this vision, the State would be consolidated as a smart consumer.

## REFERENCES

Abusleme, C. (2016). Las compras públicas de tecnología e innovación como un elemento central de las políticas públicas del siglo XXI. *Revista Chilena de Derecho y Tecnología, 5*(2), 95-126.

Aguirre, C. (2019). *Agenda de acción-propuesta para la construcción de capacidades de formulación e implementación de políticas en las organizaciones nacionales de ciencia, tecnología e innovación de Centro América y la República Dominicana*. Panamá: Secretaría Nacional de Ciencia Tecnología e Innovación, Panamá.

Beláustegui, V. (2011). *Las compras públicas sustentables en América Latina. Estado de avance y elementos clave para su desarrollo*. Argentina: Red Interamericana de compras gubernamentales / Universidad de San Martin.

Bezchinsky, G. and López, M. (2012). Compras públicas sustentables en América Latina y el Caribe, en G. Bezchinsky y G. Rozenwurcel, *La economía política de las reformas de los sistemas de compras públicas en América Latina y el Caribe*. Buenos Aires: Universidad Nacional de San Martín / International Development Research Centre, 1-26.

Bortagaray, I. (2016). *Políticas de Ciencia, Tecnología, e Innovación Sustentable e Inclusiva en América Latina.* Uruguay: Organización de las Naciones Unidas para la Educación,la Ciencia y la Cultura.

Bortagaray, I. (2019). *Políticas de ciencia, tecnología e innovación para un desarrollo inclusivo y sustentable: insumos para la reflexión a partir de experiencias de la región.*Uruguay: Universidad de la República Uruguay.

Comotto, S. and Meza, A. (2015). *Compras Públicas para la innovación: nuevas oportunidades de políticas para la región. Documento de trabajo número 8.* Argentina: Centro Interdisciplinario de Estudios en Ciencia, Tecnología e Innovación.

Del Carmen, M., Varela-Vázquez, P. and Peña-Valentín, M. C. (2019). La compra pública de innovación: análisis de la experiencia de Galicia en el ámbito sanitario. *Revista Galega de Economía*, *28*(2), 71-86.

Díaz, J. M. (2019). Transparencia, innovación y buen gobierno en la contratación pública. *Revista de Administración Pública*, (210), 472-475.

Eizaguirre, S. (2016). De la innovación social a la economía solidaria. Claves prácticas para el desarrollo de políticas públicas. *CIRIEC-España. Revista de debate sobre EconomíaPública, Social y Cooperativa*, (88), 201-230.

Filer, T. (2020). *GovTech y el futuro del gobierno: las promesas de GovTech para Iberoamérica*. Caracas: Instituto Bennett de Políticas Públicas de la Universidad de Cambridge.

Flores, K. (2011). Desarrollo del Gobierno Electrónico Municipal en la Zona Metropolitana de Guadalajara. *Paakat: Revista de Tecnología y Sociedad*, *1*(1).

Gómez, A. and Nieto, V. (2006). El mercado de compras públicas en Colombia: descripción ycaracterización. *Planeación & Desarrollo*, *37*(1), 133-170.

Guadarrama, V. H. (2017). Compras públicas de innovación. *Oficina de Información Científica y Tecnológica para el Congreso de la Unión*, (4), 1-6.

Martínez, A. and Torres, M. (2019). *Compras públicas y Big Data: El caso mexicano*. México:Instituto Mexicano para la Competitividad.

Martínez, J. (2018). Gobierno electrónico municipal. El caso de los ayuntamientos del Estado de Sonora, 2009 y 2011. *Paakat: Revista de Tecnología y Sociedad*, *8*(15), 39-57. : http://dx.doi.org/10.32870/Pk.a8n15.327

Maza, J. (2019). La asociación para la innovación desde la óptica de la buena administración (I): buena administración y compra pública de innovación. *Gabilex: Revista del Gabinete Jurídico de Castilla-La Mancha*, (17), 15-70.

Peralta, L. (2019). *El sistema de innovación para las mipymes costarricenses: hacia un modelo de articulación.* México: Comisión Económica para América Latina y el Caribe (CEPAL).

Rodríguez, S. (2014). Incorporación de las TIC en el procedimiento de compras y contrataciones del Estado. 43 Jornadas Argentinas de Informática e Investigación Operativa (43JAIIO), 14° Simposio Argentino de Informática y Derecho (SID), 81-87.

Rodríguez-Porrero, C. and Gil, S. (2014). *Accesibilidad en compras públicas*. España: Centrode Referencia Estatal de Autonomía Personal y Ayudas Técnicas (Ceapat).

Rozenwurcel, G. and Bezchinsky, G. (2007). Economía del conocimiento, innovación y políticas públicas en la Argentina. Documento de Trabajo núm. 25. Escuela de Política y Gobierno de la Universidad Nacional de San Martin.

Rozenwurcel, G. and Drewes, L. (2012). Las pymes y las compras públicas, en G. Bezchinsky y G. Rozenwurcel, *Compras públicas en América Latina y el Caribe. Diagnósticos y Desafíos.* Buenos Aires: Universidad Nacional de San Martín/International Development Research Centre, 1-24.

Saldaña, A. (2014). Integración regional y sistemas locales de innovación: desafíos para las MIPYMES. Una perspectiva desde México. *Espacio Abierto. Cuaderno Venezolano de Sociología, 23*(4), 629-642.

Sánchez, A. M. (2019). El papel estratégico de las administraciones públicas en la innovación y la sostenibilidad ambiental: compra pública verde e innovadora. *RevistaUniversitaria Europea,* (30), 177-202.

Schteingart, D. (2016). Compras públicas: una herramienta clave de la política de innovación del siglo XXI. *Industrializar Argentina*, 14-16.

Suárez, J. (2019). Las conexiones entre contratación administrativa e innovación. *Revista de Administración Pública,* (208), 450-453.

Toloza, I. and Caniuqueo, M. (2019). Descentralización de las compras públicas en Chile. *Desarrollo Territorial Colaborativo*, 399-410.

Trujillo Álvarez, M. L. and Tello Toral, K. P. (2019). *La proporcionalidad en la aplicación de sanciones a los oferentes que realizan prácticas restrictivas en las compras públicas* (Trabajo de titulación previo a la obtención del Título de Abogado de los Tribunales y Juzgados de la República). Facultad de Jurisprudencia, Ciencias Políticas y Sociales, Universidad Central del Ecuador.

Villacís, H. I. (2019). *Compras públicas y rentabilidad en las empresas del Sector Asegurador Ecuatoriano* (Trabajo de Investigación, previo a la obtención del grado académico de Magíster en Dirección Financiera de Empresas). Universidad Técnica de Ambato, Ecuador.

Zabala-Iturriagagoitia, J. (2012). Los fundamentos de las políticas de compras públicas como estímulo a la innovación y el emprendimiento. *International Conference on Regional Science*, *12*(1), 100-108.

[1] An example of this is illustrated in the work of Martínez (2018) on municipal e-government in the case of municipalities in the state of Sonora, Mexico.