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Article

Transparency and its drivers. A study of the Colombian experience (2012-2016)

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The research aim is to analyze the drivers of transparency levels in Colombian municipalities from the perspective of citizens (agency theory) and local governments (legitimacy theory). We used the Panel Corrected Standard Errors (PCSE) and a system Generalized Method of Moments (GMM) estimator in a dataset of 1,101 Colombian municipalities for five years (2012-2016). Our results show that fiscal autonomy, education, gross domestic product per capita, population size, and political participation are positively associated with public information disclosure in Colombia. Through this research, we contribute to the transparency literature in subnational governments in developing countries by examining determinants related to "citizens' monitoring abilities" and "pressures for legitimacy" in Colombia.
Keywords: transparency; public administration reforms; Colombian municipalities; public information disclosure.

Transparência e seus drivers. Um estudo baseado na experiência colombiana (2012-2016)

Este estudo analisa os impulsionadores dos níveis de transparência nos municípios colombianos desde a perspectiva dos cidadãos (teoria da agência) e dos governos locais (teoria da legitimidade). Para isso, usamos erros padrão corrigidos por painel (PCSE) e um estimador de sistema GMM em um conjunto de dados de mais de 1.101 municípios colombianos durante cinco anos (2012-2016). Nossos resultados mostram que a autonomia fiscal, a educação, o produto interno bruto per capita, o tamanho da população e a participação política estão positivamente associados à divulgação de informações públicas na Colômbia. Este estudo contribui para a literatura sobre transparência em governos subnacionais em países em desenvolvimento, examinando determinantes relacionados às "capacidades de monitoramento dos cidadãos" e às "pressões por legitimidade" na Colômbia.
Palavras-chave: transparência; reformas da administração pública; Municípios colombianos; divulgação de informações públicas.

La transparencia y sus impulsores. Un estudio desde la experiencia colombiana (2012-2016)

El objetivo de esta investigación es analizar los factores que favorecen los niveles de transparencia en los municipios colombianos desde la perspectiva de los ciudadanos (teoría de la agencia) y de los gobiernos locales (teoría de la legitimidad). Para ello, utilizamos los errores estándar corregidos para panel (PCSE) y un estimador basado en el método generalizado de momentos (GMM) en un conjunto de datos de más de 1.101 municipios colombianos

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durante cinco años (2012-2016). Nuestros resultados muestran que la autonomía fiscal, la educación, el producto interno bruto per cápita, el tamaño de la población y la participación política están asociados positivamente con la divulgación de información pública en Colombia. Con esta investigación, contribuimos a la literatura sobre transparencia en gobiernos subnacionales en países en desarrollo al examinar los determinantes relacionados con las capacidades de monitoreo de los ciudadanos y las presiones por la legitimidad, en Colombia.
Palabras clave: transparencia; reformas de la administración pública; municipios colombianos; divulgación de información pública.

1. INTRODUCTION

In recent decades, there has been a growing interest in studying transparency due to its importance for public administration and international initiatives aimed at improving the access and availability of public information (Gandía et al., 2016). Transparency is considered a good governance tool that allows citizens to participate in public decision-making (Tejedo-Romero & Araujo, 2020), as well as monitoring and evaluating the performance of mayors and other public servants (Albalate, 2013). Transparency also contributes to accountability (Lyrio et al., 2018; Piotrowski & Van Ryzin, 2007) and confidence in governments (Bearfield & Bowman, 2017; Saez-Martin et al., 2017).

Despite the above, studies on the matter are focused principally on Southern European countries (Portugal and Spain) and the United States (e.g., Bearfield & Bowman, 2017; Garrido-Rodríguez et al., 2019; Piotrowski & Van Ryzin, 2007; Tavares & Cruz, 2020). It shows very little research interest in the case of developing regions (e.g., Adiputra et al., 2018; Krah & Mertens, 2020). Therefore, we identified a research gap regarding transparency in developing countries that need to be covered since the results of available papers cannot be extrapolated.

It then becomes necessary to analyze what variables affect the level of transparency of governments in developing countries (Colombia, for this paper) and establish whether the findings already known on the matter are still valid. In this regard, it is essential to point out that transparency practices differ from country to country, depending on the contexts and jurisdictions associated with laws or regulations related to Freedom of Information (FOI) (Tavares & Cruz, 2020). Added to the above, the existing literature suggests conducting studies in countries with different administrative cultures (Grimmelikhuijsen & Welch, 2012; Tejedo-Romero & Araujo, 2020).

Furthermore, transparency has become a relevant issue in the multilateral agendas of several countries (e.g., the 2030 Agenda for Sustainable Development). In this scenario, Gilli (2017) highlights the importance of transparency to achieve Sustainable Development Goal 16, which establishes (in its target 16.6) the need to develop effective, accountable, and transparent institutions at all levels for building effective, accountable and inclusive institutions (United Nations, 2015).

Considering the above, and using the Colombian case, we model the relations between transparency (captured by a transparency index built by the Office of the Attorney General of the State – Procuraduría General de la Nación, in Spanish) and a set of political, socioeconomic, demographic, and fiscal variables. It is carried out through static and dynamic approaches and using a dataset with information from 1,101 Colombian municipalities during five years (2012-2016).

According to the agency and legitimacy theories, transparency drivers could influence citizens' or public administrators' behaviors or involve special conditions to enact and enforce transparency initiatives. We find that fiscal autonomy, some population age ranges (i.e., 35-44, 55-64, and 65-74),

education, local gross domestic product (GDP) per capita, population, and political participation contributes to the study of the differences in the progress made regarding public information disclosure and accessibility among Colombian territorial entities.

Therefore, this research contributes to the transparency literature in three ways. First, we incorporate a variable called "fiscal autonomy" (ratio of local tax revenues to total municipal revenues), typically overlooked in the literature. Second, we find empirical evidence that transparency in Colombia follows a path-dependence process, which means that the current level of public transparency depends on its past. Finally, we provide empirical evidence on the drivers of subnational transparency in a developing country (i.e., Colombia) from the perspective of citizens (agency theory) and governments (legitimacy theory).

Besides this introduction, this paper is organized into the following five sections. First, we present the conceptual background and the transparency initiatives for the Colombia case. Second, we describe the theoretical approaches and variables of interest. Then, we describe the data and methods used. Afterward, we summarize and comment on the results obtained. Finally, we present our conclusions.

2. THE CONCEPTUAL BACKGROUND OF GOVERNMENTAL TRANSPARENCY AND TRANSPARENCY INITIATIVES IN COLOMBIA

2.1 Definition and characteristics of governmental transparency

In the last decades, international organizations and governments have had a growing interest in the accessibility and availability of information as a mechanism to hold elected and appointed officials accountable for their actions, decisions, and performance. Although there is still no global regulation on transparency, some countries have adopted laws and rules to standardize the disclosure of public records and facilitate the access to this information (Corrêa et al., 2017), which is the case of the European Union (Garrido-Rodríguez et al., 2017).

Transparency is not a recent topic (Lyrio et al., 2018), and the literature has agreed on declaring that it is a vast concept (Araujo & Tejedo-Romero, 2016; Klun et al., 2019; Piotrowski, 2010) on which there is no consensus about its definition (Garrido-Rodríguez et al., 2017; Lyrio et al., 2018) or scope (Albalate, 2013; Bearfield & Bowman, 2017; Grimmelikhuijsen & Welch, 2012). Thus, transparency has been built through various interactions involving social and political actors, different perspectives (Meijer, 2013), and meanings across countries (Grimmelikhuijsen & Kasymova, 2015).

Previous research studies have stressed that governmental transparency is associated with accessibility (Bearfield & Bowman, 2017; Garrido-Rodríguez et al., 2017; Wirtz et al., 2019), availability (Araujo & Tejedo-Romero, 2016; Klun et al., 2019), disclosure or revelation (Grimmelikhuijsen & Welch, 2012; Guillamón et al., 2016), and the provision of information (Guillamón et al., 2011; Lyrio et al., 2018) to relevant stakeholders (Albalate, 2013). These topics are central to monitoring and assessing public organizations' functioning and performance (Bearfield & Bowman, 2017; Tejedo-Romero & Araujo, 2020).

From the above, transparency can be summarized as "the availability of information (supply side of Transparency) and the access and usability of this information by citizens and stakeholders

(demand side of Transparency)" (Araujo & Tejedo-Romero, 2016, p. 329). Under this concept, the topic is analyzed from two perspectives: on the one hand, the right of users to have access to information and, on the other one, the responsibility of governments to ensure the availability of public information (Tejedo-Romero & Araujo, 2020). Particularly, this concept of transparency has received some acceptance in academic research during recent years (Garrido-Rodríguez et al., 2019; Tavares & Cruz, 2020; Tejedo-Romero & Araujo, 2020; Wirtz et al., 2019).

2.2 Differences between transparency, open government, and e-government

Due to the multiplicity of conceptual approaches, transparency is often related as synonymous with other concepts such as open government (Meijer et al., 2012), FOI (Tavares & Cruz, 2020), and E-government (Harrison & Sayogo, 2014). However, there are specific differences between these concepts and their scope.

In the case of open government, literature and technical studies have established that it is a broader concept than transparency since the former incorporates participation (Meijer et al., 2012; Puron-Cid, 2014) and collaboration (Meijer et al., 2012; Obama, 2009; Wirtz et al., 2018). Therefore, open government expands in two ways, as it requires the involvement of government entities and the participation of societal actors (citizens) (Wirtz et al., 2018) since "it is not only about openness in informational terms (vision) but also about openness in interactive terms (voice)" (Ruijer et al., 2020, p. 10).

In addition, the call for transparency in recent times has also led to demands for accessibility to public information and tools to manage and provide government services (Adiputra et al., 2018; Dias, 2020), involving *inter alia* new information and communication technologies (ICTs) (Corrêa et al., 2017; Tavares & Cruz, 2020) through the concept of E-Government. ICTs, such as social networks and Web 2.0 tools, are used to facilitate access to information by citizens and thus improve transparency (Halachmi & Greiling, 2013) and accountability in the public sector. Furthermore, these tools allow dialogue, social participation, and government outreach at a low cost (Lyrio et al., 2018), besides public efficiency (Grimmelikhuijsen & Welch, 2012).

2.3 Transparency initiatives and the Colombian case

From a regulatory perspective, transparency has emerged from the call of international organizations (Garrido-Rodríguez et al., 2017), policy experts, and non-governmental organizations (Bauhr & Grimes, 2014) to promote international legislation on this issue and to comply with the fundamental right to FOI (Tavares & Cruz, 2020). In response to these appeals, most countries have integrated transparency "from policies, institutions, and practices that provide information in ways that improve understanding of public policies, enhance their political effectiveness and reduce policy uncertainty" (Guillamón et al., 2011, p. 391).

Access to public information in Colombia is guaranteed in its Political Constitution. Article 74 states that "all persons have the right to access public documents, except in the cases established by the law." For its part, Article 23 points out that "everyone has the right to submit respectful petitions to the authorities for reasons of general or particular interest and to obtain a prompt resolution. Likewise,

the legislator may regulate this issue in private organizations to guarantee fundamental rights." With this mandate, the Colombian State has defined different legal mechanisms, among which the most important is Law 1714, enacted in 2014, which regulates access to public information and establishes the procedures for exercising this right through the publication of information via electronic media. This law also facilitates proactive disclosure of information under timeliness, reliability, completeness, and relevance.

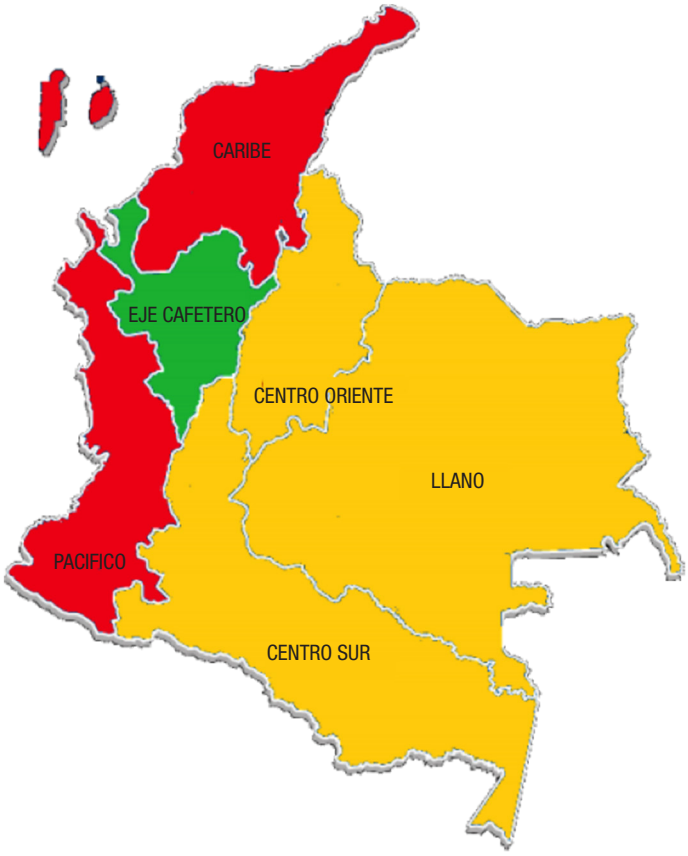
In addition, Decree 2573 of 2014 establishes general guidelines for the government's strategy regarding the use of ICTs to promote efficiency in public administration, citizen participation, and social collaboration. For its part, Decree 1008 of 2018 was also issued to set up general guidelines for digital government policy. These pro-transparency initiatives apply to all government entities in the country, including provincial and local governments.

In this regard, the Political Constitution establishes that Colombia is a social state governed by law and organized as a unitary decentralized republic with autonomy for its territorial entities. According to the National Planning Department. (Departamento Nacional de Planeación [DNP], in Spanish), the country currently has 32 provinces, a capital district, and 1,103 municipalities with administrative decentralization at the regional and local levels.

Moreover, Colombia has recently shown interest in promoting open government and ICTs in the public sector. For this purpose, the country has been an active member of the Open Government Partnership (OGP) since 2011 and has designed four action plans until 2022. These plans include citizen participation, gender equity, peacebuilding, environment, budget, and open data commitments. To measure the progress of public transparency in Colombia, the Attorney General of the State provides a measurement called the Open Government Index (OGI). Despite its name, which suggests conceptual misunderstanding, this index serves as an instrument to monitor the degree of legal compliance regarding the disclosure of public information among territorial entities (i.e., municipalities and provinces) for the 2012-2016 period (the OGI was provided until 2016).

The individual results show distinct levels of transparency in the territorial entities (Figure 1) under a transparency law applicable to all of them. These results suggest that several factors (e.g., the socioeconomic and political context) have influenced the levels of public information disclosure by sub-national governments, which is discussed in the following sections.

FIGURE 1 RESULTS BY REGION FOR THE INFORMATION DIALOGUE DIMENSION (OGI-2016)



Note: Green is used for indices above 83.8, yellow for the range 75.7 to 83.8, and red for scores below 75.7.

Source: Procuraduría General de la Nación (2016).

3. THEORETICAL APPROACHES AND VARIABLES OF INTEREST

3.1 Agency and legitimacy theories

Studies related to the factors or drivers that promote the disclosure of public information identify different theoretical approaches, highlighting the agency and legitimacy theories as relevant insights (Baldissera et al., 2021; Garrido-Rodríguez et al., 2019; Klun et al., 2019; Tejedo-Romero & Araujo, 2020). These theories capture citizens' demands for public transparency and the respective preferences of public officials in this regard (Araujo & Tejedo-Romero, 2016).

Agency theory focuses on the problems related to information asymmetry between principals (i.e., citizens) and agents (i.e., officials or politicians) and the existing conflicts of interest (Baldissera et al., 2021; Tejedo-Romero & Araujo, 2018). The information that governors know about their decisions and the management of public resources is not always accessible or understandable to citizens, so

the former could use this situation opportunistically for their benefit. For instance, this is the case when governments increase public spending through debt to gain votes without recognizing the future macroeconomic effects, such as spending cuts or tax increases to pay off debt (known as the fiscal illusion).

For its part, public information availability allows citizens and other external users to monitor and evaluate public administration's internal work and performance (Araujo & Tejedo-Romero, 2016). Therefore, transparency reduces information asymmetries between elected officials and citizens (Albalate, 2013), minimizes corruption by preventing price-fixing, decreases the opportunities for bribes, and provides whistleblowing opportunities (Bertot et al., 2010; Harrison & Sayogo, 2014). Even if officials and politicians intend to avoid deep scrutiny over their decisions and performance (Garrido-Rodríguez et al., 2019; Tavares & Cruz, 2020), citizens may exercise their voting power in a democracy, calling for more public information. Indeed, agency theory is a demand-side approach that appeals to citizens' interests and capabilities to explain the pressures for transparency. Hence, it suggests considering citizens' monitoring abilities.

From another ground, legitimacy theory considers that public and private organizations must disclose information related to their activities as a mechanism to legitimize their actions before their stakeholders (Baldissera et al., 2021; Deegan, 2002, 2014). Some authors have highlighted that having more public information available to citizens and other interested parties contributes to legitimizing the actions of governing actors and improving political perceptions since it facilitates the knowledge flow and the monitoring of politics (Araujo & Tejedo-Romero, 2016; Cruz et al., 2016; Meijer et al., 2012).

Thus, public information disclosure contributes to increasing the legitimacy of governments through a greater acceptance of public management and citizen support (Meijer et al., 2012). Faced with this, politicians have special incentives to legitimize their decisions and proposals in particular scenarios, such as elections, considering democratic or electoral pressures. In addition, they can improve their public image by showing how they increase citizens' well-being (Cruz et al., 2016; Tejedo-Romero & Araujo, 2018).

However, politicians and officials will hardly disclose the information if third parties judge their actions in a way that may affect their reputation. Hence, the legitimacy theory requires strong motivations that tip the balance in favor of public transparency (i.e., a supply-side approach). Indeed, officials can appeal to the disclosure of certain information to regain the confidence of citizens when public legitimacy is threatened (Tejedo-Romero & Araujo, 2018), for instance, during times of economic crisis or when changes in the government are likely to occur. Furthermore, fiscal reforms are more likely to emerge in an economic downturn (Castañeda-Rodríguez, 2016), which may lead to greater pressure to inform how additional resources are used.

Although transparency can reduce information asymmetries and legitimize the administration's decisions, it also has a dark side, as it can generate negative consequences and cost overruns. For example, through a qualitative study in Taiwan, Yang et al. (2015) found that some government agencies feared that some citizens would misuse public data or increase their workload. Based on this evidence, the success of transparency initiatives requires forces or pressures from the supply and demand sides to help overcome the lack of commitment or doubts about the process.

3.2 Transparency drivers

We focus first on citizens' monitoring abilities and interests based on the agency theory. Citizens are more likely to demand public information under specific characteristics (e.g., reliability) when they are interested in doing so and can do it. Consequently, it is important to consider variables such as the education level, per capita income, population size (and its distribution by age and gender), and political participation (Baldissera et al., 2021; González-Bustamante et al., 2020; Mourao et al., 2020;[1] Tejedo-Romero & Araujo, 2018; Schnell & Jo, 2019).

Citizens may be reluctant to demand, access, and use public information, such as procurement and budgeting or financial issues, when they cannot understand it or are unaware of its importance, which requires interest and cognitive skills (Schnell & Jo, 2019). Therefore, education level and GDP per capita are expected to be positively associated with public transparency (Mourao et al., 2020; Schnell & Jo, 2019; Piotrowski & Van Ryzin, 2007), which corresponds to hypotheses 1 and 2 respectively (or H1 and H2 in Box 1). In addition, per capita income is a proxy of institutional capacity, which is, in turn, a core factor in the development of transparency-related activities such as record-keeping, public information management, data analysis, and citizen attention (Schnell & Jo, 2019).

Although assertions such as the above are generally made with respect to the conditions or particularities of an individual, they can also be contrasted in an aggregate manner (by municipality) as suggested in this work. From now on, these hypotheses will be associated with those indicated in Box 1 (see below).

Likewise, demographic variables influence citizens' monitoring abilities and their interests, as in the case of population size, its distribution by age and gender, or the urbanization level. Indeed, a large population implies greater civil and media monitoring of the decisions and performance by officials since more people could be affected by government policies (Guillamón et al., 2016; Mourao et al., 2020) (H3, Box 1). Additionally, it is easier to see government outcomes in terms of public investment and performance in urban areas (e.g., through the condition of the road network), so more pressures may arise to disclose public information in urban municipalities (Laswad et al., 2005) (H4, Box 1).

As for age and gender, these variables are associated with changes in people's motivations and social capital (Castañeda-Rodríguez, 2021; Esteller-Moré & Polo, 2012; Hansen & Goenaga, 2019; Martinez-Vazquez & Torgler, 2009; Tejedo-Romero & Araujo, 2018). Therefore, demands for public transparency are expected to increase with age, particularly for people over 65, as they have stronger ties to their communities (H5, Box 1). Likewise, Hansen and Goenaga (2019) suggest that democratic attitudes are different between women and men, as the firsts give more importance to characteristics such as direct participation and the public justification of government decisions (H6, Box 1).

Regarding the political framework, high electoral turnout would indicate that people are committed to public involvement, which also encourages the control and oversight of officials and becomes a form of pressure for greater transparency (Mourao et al., 2020). On the other hand, some authors stress that low voter turnout may threaten the legitimacy of public organizations leading to transparency for restoring public trust (Tejedo-Romero & Araujo, 2018).[2] Despite this, we expect the association suggested by the agency theory to prevail (H7, Box 1).

[1] These authors, as well as Schnell and Jo (2020), focus on fiscal and budget transparency.

[2] It means that the expected association between electoral participation and transparency differs according to the theory considered.

Now, it is time to consider, from the legitimacy theory, the economic and political pressures that a municipal government confronts and make it take a particular position regarding transparency. For instance, variables such as elections, particularly executive ones, the mayor's percentage of votes, and the debt payment capability can affect governors' behavior. Although officials can consider other socioeconomic pressures, such as the unemployment rate, when they decide on transparency issues for legitimacy purposes, we do not include them because the corresponding data are unavailable for all Colombian municipalities.

Incumbents are likely to appear accountable for their actions and decisions in election years to win votes, so disclosing public information can serve this purpose (Baldissera et al., 2021) (H8, Box 1). Additionally, increasing transparency can be seen as a strategic decision if the incumbent is aware of the risk of losing the election since successors would be more exposed to citizens and the media. For its part, a low proportion of votes obtained by the elected mayor indicates that this person does not have the support of citizens, so he/she can resort to practices such as the disclosure of public information to gain legitimacy (Esteller-Moré & Polo Otero, 2012; Mourao et al., 2020; Schnell, 2018) (H9, Box 1).

Officials will also be more likely to release financial and budget information when the numbers indicate that the municipal government makes financially responsible decisions. In other words, when the municipal debt payment capacity is high, this motivates administrations to disclose the respective figures (H10, Box 1) and state that this fact contributes to the well-being of citizens (e.g., avoiding future tax increases). Conversely, literature tends to agree that there is a negative correlation between the level of public debt and the degree of government openness (or transparency) (Alt et al., 2006; González-Bustamante et al., 2020).

Now, both agency and legitimacy theories support the inclusion of fiscal autonomy in this paper, a factor that is not common in the literature. Citizens are more likely to claim improvements in transparency, and incumbent officials will become more accountable when municipal revenues are heavily dependent on taxes.

People need to know how the government spends their taxes, which turns out to be a pressure for the disclosure of public finances and government policies. Additionally, local authorities may try to keep or even increase citizens' confidence in municipal administration and justify tax collection measures by showing the sources and uses of public funds (H11, Box 1). On the contrary, the lower the taxes paid by citizens – which can be compensated with transfers and debt –, the lower the demand and supply of public transparency.

We include three variables to control for municipal characteristics that can affect the socioeconomic and political context in which transparency initiatives are applied. Therefore, we create two dummies, one for provincial capitals and another to distinguish mayors who govern under political coalitions. It is also worth mentioning that the political party in power may influence the government's position regarding transparency (Baldissera et al., 2021).

Finally, Box 1 shows the descriptions and sources (we mostly use the official System of Territorial Statistics [Terridata] administered by the National Planning Department) of the encoded variables used in the empirical exercise. This table also presents some hypotheses about the expected associations

between such variables and the level of transparency, where possible, considering the agency and legitimacy theories and the results of other empirical studies[3].

BOX 1 DESCRIPTION OF VARIABLES AND HYPOTHESES

	Encoded variable	Hypotheses	Description	Source
Dependent variable	Transparency		Measured through the OGI that belongs to the range [0, 100], as explained in the next section	PGN
Citizens' monitoring abilities	Education	H1: +	Ratio of immediate transit to tertiary education[4]	MEN
	Mun_GDPP	H2: +	Local GDP per capita at constant COP of 2008	DNP
	Population	H3: +	Population	
	Urban_Pop	H4: +	Percentage of urban population	
	Pop_15-24		Pop_x-y means the percentage of population with ages between x and y years	
	Pop_25-34			
	Pop_35-44			
	Pob_45-54			
	Pob_55-64			
	Pob_65-74	H5: +		
	Pob_75+	H5: +		
	Women_perc	H6: +	Percentage of female population	
	Turnout	H7: +	Ratio of voters to the electoral census	MOE
Pressures for legitimacy	Elect_year	H8: +	Dummy variable that equals 1 for an election year (i.e., 2015)	
	Perc_Win	H9: -	Ratio of votes obtained by the elected mayor to the total number of votes	
	Payment capacity	H10: +	(1-(Debt service/ Disposable income))x100	DNP
Fiscal covenant	Fiscal_autonomy	H11: +	Ratio of local tax revenue to total municipal revenue	

Continue

[3] The variables for which an association cannot be proposed from a theoretical perspective do not include a hypothesis (for example, political parties).

[4] Share of high school graduates who enroll in technical or professional programs in the year following the completion of secondary education; it works as a proxy for tertiary education coverage. While there are other alternatives for capturing citizens' education, such as the percentage of adult population with a bachelor's degree or higher over the total adult population, tertiary school enrollment, and age-standardized education per capita, these measures are not available at the municipal level in Colombia.

	Encoded variable	Hypotheses	Description	Source
Control variables	Conservador		Dummy variable that equals 1 if the elected mayor belongs to the political party shown	MOE
	Liberal			
	Part_U			
	AICO			
	ASI			
	POLO			
	Afrovides			
	Alianza_Verde			
	Cambio_Rad			
	Cent_Democrático			
	MAIS			
	MIO			
	MIRA			
	Opc_ciudadana			
	PIN			
	Coalition		Dummy variable that equals 1 if the elected mayor belongs to a political coalition	
	Capital		Dummy variable that equals 1 if the respective municipality is the provincial capital	Authors

Note 1: The following are the meanings of the acronym in Spanish: Procuraduría General de la Nación (PGN); Ministerio de Educación Nacional (MEN); Departamento Nacional de Planeación – Territdata (DNP); Misión de Observación Electoral (MOE)[5].

Note 2: For the age ranges 65-74 and 75+ the numbering of the hypotheses is the same (that is, H5) since the agency theory only suggests that older people would be more interested in public affairs and in monitoring the actions of officials, which applies, for example, to retired people. Ratios are measured in terms of percentages (i.e., multiplied per 100).

Source: Elaborated by the authors.

4. DATA DESCRIPTION AND METHODS

To capture the public transparency level in the Colombian territorial entities, we used the OGI provided by the Office of the Attorney General of the State for 1,101 municipalities (out of a total of 1,103) and 32 provinces (the total number of Colombian provinces) during the period 2012-2016. This composite index measures to what extent the information on the activities conducted by subnational governments, in terms of their management and results, is disclosed through the country's information systems (Procuraduría General de la Nación, 2016).

[5] Retrieved from https://www.datoselectorales.org/

The OGI latest comparable version (i.e., for 2016) collects and evaluates information using three weighted dimensions (i.e., organization, exhibition, and dialogue regarding public information), eight weighted categories (i.e., internal control, document management, procurement, basic territorial reporting, administrative and financial management systems, E-government, transparency and accountability, and attention to the citizen), and 24 weighted indicators (Box 2). Each indicator score is between 0 and 100, where 100 is the maximum score concerning reporting and compliance in the respective matter.

BOX 2 OGI STRUCTURE

Dimension	Category	Indicator
Information organization (20%)	Internal control (12%)	Internal Control Standard Model (8%)
		Internal Accounting Control (4%)
	Document management (8%)	Archives law (8%)
Information exhibition (50%)	Procurement (18%)	Publication of contracts (14%)
		Annual Procurement Plan (4%)
	Basic territorial reporting (16%)	Unique Information System (4%)
		Beneficiaries of the Social Programs System (4%)
		Integrated Enrollment System (4%)
		Hospital Information System (4%)
		Territorial Single Form (4%)
		Royalties (4%)
	Administrative and financial management systems (16%)	SICEP - Budget Execution System (4%)
		Public Employment Information and Management System (2%)
		Information and Management of Assets System (2%)
Information dialogue (30%)	e-Government (16%)	Open Government politics (4%)
		Services (3%)
		SICEP - Open data (3%)
		SICEP - Disclosure (3%)
		Single Information System for Procedures (3%)
	Transparency and accountability (8%)	SICEP - Anti-corruption measures (2%)
		SICEP - Risk map (2%)
		SICEP - Control and monitoring (2%)
		SICEP - Accountability (2%)
	Attention to the citizen (6%)	SICEP - Attention to the citizen (6%)

Note 1: The numbers in brackets are the corresponding weights.

Note 2: SICEP is the Spanish acronym for "Sistema de información para la Captura de Ejecución Presupuestal" (Information System for Capturing Budgetary Execution).

Source: Elaborated by the authors based on Procuraduría General de la Nación (2016).

This index considers through the exhibition dimension the extent to which financial and management information (e.g., procurement, financial reporting, and government spending by sector) is available. Likewise, the OGI considers the channels citizens can use to access public information and make their requests so they can be met (i.e., the dialogue dimension). This index also establishes whether there are guarantees on the reliability of the information, so it measures – through the organization dimension – the level of implementation of the standard internal control and accounting control model in a territorial entity, as its document management capabilities.

Table 1 presents basic statistics about our data panel considering only the observations for 1,101 Colombian municipalities during 2012-2016. Data is missing for some variables and years, which explains why the total number of observations per variable varies slightly. Despite this, we have a highly balanced panel. This data structure allows us to model common and individual behaviors among groups and increase observations. The analysis period is 2012-2016, as the OGI (our transparency proxy) is comparable and available for those years.

TABLE 1 DESCRIPTIVE STATISTICS

Encoded variable	Obs.	Mean	Std. Dev.	Min	Max
Transparency	5505	67.074	10.293	20.933	94.508
Education	5500	26.584	12.516	0	77.778
Mun_GDPP	5505	10600000	24200000	1454341	795000000
Population		43176.42	265715.2	968	7980001
Urban_Pop		44.298	24.083	1.710	99.910
Pop_15-24		18.693	1.824	10.810	41.900
Pop_25-34		13.982	1.651	8.390	21.230
Pop_35-44		11.529	1.421	6.760	21.940
Pob_45-54		10.411	1.746	4.550	16.210
Pob_55-64		7.4729	1.677	2.700	13.660
Pob_65-74		4.743	1.496	1.280	13.640
Pob_75+		3.313	1.423	0.400	11.450
Women_perc		48.877	1.786	30.720	54.320
Turnout		67.250	8.995	0	93.330

Continue

Encoded variable	Obs.	Mean	Std. Dev.	Min	Max
Perc_Win	5504	48.304	10.685	18.640	93.153
Elect_year	5505	0.200	0.400	0	1
Payment capacity	5503	4.040	4.955	0	99.400
Fiscal_autonomy	5504	13.722	12.158	0	89.514
Conservador		0.169	0.374	0	1
Liberal		0.161	0.367	0	1
Part_U		0.222	0.412	0	1
AICO		0.009	0.096	0	1
ASI		0.047	0.212	0	1
POLO		0.007	0.082	0	1
Afrovides		0.014	0.117	0	1
Alianza_Verde		0.041	0.199	0	1
Cambio_Rad		0.135	0.342	0	1
Cent_Democrático		0.010	0.100	0	1
MAIS		0.004	0.062	0	1
MIO		0.018	0.134	0	1
MIRA		0.001	0.027	0	1
Opc_ciudadana		0.009	0.095	0	1
PIN		0.025	0.157	0	1
Coalition		0.076	0.265	0	1
Capital	5505	0.028	0.165	0	1

Source: Elaborated by the authors.

It is important to highlight that variables measured in monetary units or related to the number of inhabitants (i.e., GDP per capita, and population) are transformed through their natural logarithms. We transformed them to avoid common statistical problems that are likely to occur with differences in scales; for example, non-stationarity in the models.

Concerning econometric modeling, a static approach can first be considered. In general, it is required to choose between a Pooled Ordinary Least Square Estimator (POLSE), which neglects the

data panel structure, fixed effects (FE), and random effects (RE). Therefore, we run the Breusch and Pagan Lagrangian multiplier and F tests, the last one under the null hypothesis that all municipality dummies are zero. The results suggest that both RE and FE estimates are better than POLSE since the P-values for both tests are zero. Similarly, and through the Hausman test, it is determined that the FE is preferable over the other estimates.

It is also relevant to contrast basic assumptions such as homoscedasticity and not cross-municipality or serial correlations using three well-known and standard tests: the modified Wald test for GroupWise heteroskedasticity, the Breusch-Pagan LM test of independence, and the Wooldridge test for autocorrelation. These show that basic econometric assumptions are not met in our case, so we resort to a Panel Corrected Standard Errors (PCSE) model, following Beck and Katz (1995).

The general structure of the static models mentioned above is defined in Equation 1. Here, the transparency level for a pair *it* (municipality-year) depends on a set of K factors (with), presented in the previous section, so is the *k*-th variable for the pair *it*. Equation 1 also includes municipality-specific characteristics represented by , so it is a dummy variable that equals 1 for the municipality *i* (i.e., municipality dummies).

$$Transparency_{it} = \alpha_i + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it} \qquad \text{[Equation 1]}$$

However, institutional changes can also depend on the results of past initiatives, as suggested by serial correlation, which motivates including the lag of the dependent variable on the right side of Equation 1. Besides, other variables may be endogenous for several reasons, mainly because causality can run in both directions. For example, as fiscal autonomy would favor transparency extension (H11, Box 1), better and greater disclosure of public information, in turn, could improve citizens' trust in their government and foster tax compliance (Castañeda-Rodríguez, 2021). Consequently, dynamic models also deserve attention.

In this regard, the difference GMM proposed by Arellano and Bond (1991) does not provide reliable coefficients under heteroskedasticity and excludes constant-time regressors (e.g., the dummy variable for capital cities). Therefore, we applied a system GMM estimator that starts from a level equation and includes a lag of the dependent variable, as observed in Equation 2. Moreover, according to Benedek et al. (2014, p. 75), "the resulting system-GMM estimator has much better finite sample properties in terms of bias and root mean squared error than that of the difference-GMM estimator."

$$Transparency_{it} = \alpha_i + \lambda Transparency_{it-1} + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it} \qquad \text{[Equation 2]}$$

5. RESULTS AND DISCUSSION

Table 2 displays our static and dynamic estimates applying the aforementioned techniques (i.e., PCSE and system GMM). Dynamic models (last two columns) add three rows showing Arellano-Bond tests for the first differences and the Hansen test, the last one to verify the instruments' validity. Including the lag of the dependent variable as a regressor in Equation 2 generates serial correlation of

order 1 in differences. However, there is no serial correlation of order 2 at the 99% significance level. Furthermore, the instruments (i.e., suitable lags of the first differences of the variables in levels) are statistically valid, as suggested by the Hansen test.

TABLE 2 STATIC AND DYNAMIC ESTIMATES

Model	1	2	3	4
Lag Transparency			0.535***	0.536***
Education	0.065***	0.060**	0.029**	0.024*
Log_Mun_GDPP	2.056***	1.921***	1.146***	1.315***
Log_Population	0.630**	0.859***	0.363**	0.374***
Urban_Pop	-0.050***	-0.049***	-0.014*	
Pop_25-34	-0.403		-0.632***	-0.589***
Pop_35-44	1.408***	1.047***	1.304***	1.290***
Pob_45-54	-0.469		-0.954***	-0.950***
Pob_55-64	0.368		0.465**	0.472**
Pob_65-74	1.392***	0.770***	0.520*	0.394**
Pob_75+	-1.070*		-0.237	
Women_perc	0.344**	0.215*	0.089	
Turnout	-0.037		0.022*	0.028*
Perc_Win	0.019	0.016*	0.013	
Elect_year	1.142		2.769***	2.786***
Payment capacity	0.062		-0.001	
Fiscal_autonomy	0.126***	0.130***	0.056***	0.047***
Conservador	0.533		-0.136	
Liberal	-0.140		-0.493	
Part_U	0.095		-0.761	
AICO	-0.935		-1.695	
ASI	0.100		-1.380*	
POLO	2.486		0.052	
Afrovides	-1.718*		0.256	
Alianza_Verde	-0.682		-0.691	
Cambio_Rad	-0.535		-0.525	
Cent_Democrático	-2.035		-0.684	
MAIS	-2.084		-3.456**	-2.856*

Continue

Model	1	2	3	4
MIO	1.221*		0.309	
MIRA	5.175	6.449**	-1.231	
Opc_ciudadana	-4.849***	-5.279***	-3.634***	-3.099**
PIN	-2.222***		-1.585	
Coalicion	-0.801		-0.420	
Capital	3.780*	3.344*	3.884***	3.616***
Number of observations	5497	5497	4397	4397
r2	0.971	0.970		
Arellano-Bond test for AR(1)			0.000	0.000
Arellano-Bond test for AR(2)			0.336	0.342
Hansen test of overid. Restrictions			0.351	0.645

Note 1: Significance levels: * 0.05 ≤ p-value < 0.10; ** 0.01 ≤ p-value < 0.05; *** p-value < 0.01.

Note 2: We used STATA 15 for estimating the respective models.

Source: Elaborated by the authors.

Models 1 and 3 in Table 2 correspond to static and dynamic estimates, respectively, including all the previously discussed variables (Box 1). On the other hand, models 2 and 4 (Table 2) are the product of an iterative process in which statistically non-significant variables were removed, starting with those with higher P-values. This process was performed in order to obtain parsimonious estimates that capture the most relevant factors associated with transparency.

We also ran two suitable panel unit tests for relatively short datasets in T (our case) to verify the series stationarity and avoid any doubt about spurious relationships. We used the Harris-Tzavalis test, as it is less restrictive than other ones (e.g. allows non-normality), and the Fisher test, which is asymptotically optimal and nonparametric (Maddala & Shaowen, 1999).

Considering the possible non-stationarity of some variables (i.e., those encoded as Log_Mun_GDPP, Urban_Pop, Pop_25-34, Pop_35-44, Pob_45-54, Pob_55-64, Pob_65-74, Pob_75+, Turnout, and Perc_Win) in our models, according to the tests mentioned above, we studied whether there were long-run relationships between them. Therefore, we used the Kao test for panel cointegration, which allows the inclusion of 10 regressors (our case) and displays five test statistics. The corresponding results, (Table A, Annex) provide evidence that variables in all panels are cointegrated and build confidence in our estimates (Table 2).

Before proceeding to discuss our findings, it is important to mention that the considered municipalities are distributed in provinces with particular features and that estimates (Table 2) give equal weight to observations, without considering differences between cross-sections (e.g., Bogotá has around eight million inhabitants, while Busbanzá, in Boyacá, less than one thousand). Therefore, Table B (Annex) shows the basic models previously presented, but this time applying the jackknife resampling technique.

We divided the dataset by municipalities into ten population-based deciles and ran as many regressions as clusters (i.e., 10) by iteratively leaving out each group to control possible sample bias. Hence, the corresponding coefficients are the averages of the ten coefficients previously estimated. Table B (Annex) indicates that the sample distribution by population is not a driver of our findings.

The most populated territorial entities can influence the approval of public policies, for example, the determination of tax powers or the application of public transparency norms, without considering the needs and interests of minorities. This behavior is explained by the predominance of the principle of popular representation in the conformation of the upper and lower chambers of the Colombian Congress (Rodríguez, 2001, 2017), one of the main shortcomings of the 1991 Political Constitution to implement the figure of a decentralized unitary state and achieve a vertical distribution of political power in the country.

With that in mind, we can also apply the jackknife resampling technique by dividing the dataset by provinces, considering that Colombian provinces present differences in aspects such as their economic situation and population (Rodríguez, 2017) and include a dissimilar number of municipalities (e.g., while Antioquia has 125 municipalities, Amazonas groups only two).

Public transparency results depend partly on the institutional strength to promote and enforce policies in this area (Schnell & Jo, 2019), so it is important to consider whether the differences between provinces could affect our results. Consequently, there are 33 clusters if we take into account that the Colombian Constitution of 1991 establishes that the country is a unitary and decentralized republic divided administratively and politically into 33 units (32 provinces and a capital district); however, the regressions are similar to those in Table B (Annex) (hence omitted).

Likewise, we could re-estimate the models by considering a dataset that includes only observations for the 32 Colombian provinces during the period 2012-2016.[6] Nevertheless, the respective coefficients are consistent with those estimated in Table 2, which were excluded for space considerations.

After checking the robustness of our econometric models, it is time to discuss the findings. From here on, we will focus on Model 4 (Table 2) as it shows that transparency follows a path-dependence process (according to the significance of its lag) (Equation 2) and only includes statistically significant variables. We will first refer to the results that deviate from the respective hypotheses (Box 1) or are contrary to what was expected.

This model (i.e., Model 4, Table 2) shows that there is not a linear relationship between transparency and population age; only three age population ranges (i.e., 35-44, 55-64, and 65-74) correlate positively and significantly with our endogenous variable. This suggests the need for future research that investigates what features distinguish people in each age group and how this affects their interests and abilities to monitor governments.

Although our final model excludes the urban population as an independent variable, the other three models in Table 2 show a negative association between the former and transparency (contrary to H4, Box 1), which suggests that people living in cities do not always have the required time or interest to keep themselves informed about public issues. This result could be due to the multiple occupations of urban residents that would lead to lower demand for information. For instance, national surveys for the United States indicate that rural residents are more rooted in their communities (Pew Research Center, 2018) and therefore more interested in participating in discussions of public affairs (which

[6] It is possible since the OGI is also provided for provinces.

requires information) than their counterparts in urban areas. This point requires further research in the context of developing countries.

Additionally, Colombia is a highly urbanized country (81.1% of its population lives in urban areas, according to the World Bank, 2020). However, some of its provinces stand out in this regard but with poor results in terms of public transparency. For example, Atlántico and Bolívar, where most of the population lives in urban areas (95.7% and 77.7%, respectively), at the same time belong to the Caribbean, a region that has not achieved outstanding results in public information disclosure (Figure 1). Hence, our estimates could be capturing this fact.

Regarding political parties (control variable), only two of them (i.e., MAIS and Opción Ciudadana) correlate negatively with transparency, according to Model 4 (Table 2). In the future, it is required to study whether some characteristics of a given political party (e.g., the method of selecting candidates) could affect the position of politicians regarding transparency in the Colombian case.

For its part, our findings on the correlation between education, GDP per capita, population, voter turnout, political cycle (i.e., elections), and fiscal autonomy, on the one hand, and transparency, on the other, are aligned with our hypotheses (i.e., H1, H2, H3, H7, H8, and H11, Box 1). In this regard, for instance, our results support the point of agency theory that the greater the interest of citizens in engaging in public affairs, the greater the demands for public information disclosure, as suggested by hypothesis 7 (Box 1).

We also establish that fiscal autonomy correlates positively, significantly, and consistently with transparency. The above is reasonable since citizens are more willing to allocate part of their time and efforts to monitor what is done with the public treasury and hold the administration accountable for its decisions and performance when paying high taxes (the numerator of our fiscal autonomy indicator). Likewise, and according to the legitimacy theory, officials are more likely to adopt and enforce transparency initiatives in order to legitimize the tax burden. Fiscal autonomy seems to be a core element in improving and deepening transparency.

When municipalities depend mainly on transfers (i.e., have low fiscal autonomy), as with most local administrations in Colombia (Hernández & Barreto, 2018), three effects derive from this situation. First, a reduction in the administration's discretion in public spending since these resources are highly conditioned to two items: education and health care (about 80% of transfers through the General System of Participations). Second, citizen monitoring becomes less necessary due to fewer agency problems. Third, there is a diminished interest of officials to legitimize their policies through transparency initiatives. The above should receive special attention if we consider that, on average, 73.63% of the income of Colombian municipalities comes from national transfers (DNP, 2021).

In summary, our results support the hypotheses H1, H2, H3, H5 (partially), H7, H8, and H11. In contrast, we found no evidence for hypotheses H4, H6, H9, and H10 (see Box 1).

6. CONCLUSIONS

As discussed throughout this paper, public transparency depends on many variables related to citizens' and officials' behaviors from different perspectives, as explained by the agency and legitimacy theories. However, sometimes the theoretical effect of a variable can be ambiguous, which directs attention towards empirical work. For instance, based on the agency theory, high electoral turnout is expected to be positively related to transparency (Esteller-Moré & Polo, 2012; Mourao et al., 2020), which

aligns with one of our hypotheses (H7, Box 1). On the other hand, low voter turnout may threaten the legitimacy of public organizations, so governments can foster transparency initiatives to restore public trust (Tejedo-Romero & Araujo, 2018). The above is valid for other potential transparency drivers.

In addition, studying the factors that motivate or restrain public transparency in developing countries, such as Colombia, is essential due to the difficulty of generalizing results obtained in different socioeconomic contexts (e.g., carried out in developed countries). Among other things, we find that fiscal autonomy is positively correlated with transparency, which suggests the benefit of making local governments more responsible for financing their expenditures when possible; it is especially applicable to territorial entities with tax capacity.[7] Although other studies have discussed this association, such as that led by Tejedo-Romero and Araujo (2018) for the Spanish case, the evidence in this dimension was not conclusive.

This study contributes in several ways to the literature on public transparency. On the one hand, it provides empirical evidence on the drivers behind public transparency in a developing country such as Colombia and finds evidence about a path-dependence process (i.e., the level of public transparency today depends on the corresponding level reported yesterday). On the other hand, this research shows that transparency levels in Colombian municipalities also depend on different economic, political, and demographic factors, some of them related to the demand for information due to pressures from citizens and other stakeholders (agency theory), such as education, GDP per capita, population, and political participation. Other variables refer to officials' motives for gaining or preserving legitimacy (legitimacy theory), such as the occurrence of executive elections.

For future research, we recommend studying the incidence of institutional factors on transparency levels and conducting comparative studies with other Latin American countries in order to show if similarities prevail or unobservable factors influence the outcomes. Furthermore, studying how local governments could raise tax revenues (or fiscal autonomy) and compliance when facing political, institutional, or economic constraints would be an interesting subject. Finally, we believe that it is necessary to delve into the progress and the effects of transparency in developing countries and its role in meeting the sustainable development goals of the 2030 Agenda.

[7] For small municipalities with low economic development, it would be necessary to promote public transparency from the central government and provide them with the necessary tools to improve in this matter (for example, training). The institutional theory approach could serve this purpose.

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DATA AVAILABILITY

The entire dataset supporting the results of this study is available upon request to Víctor Castañeda-Rodríguez (vmcastanedar@unal.edu.co). The dataset is not publicly available due to file size.

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ANNEX

TABLE A KAO TEST FOR PANEL COINTEGRATION

Ho: No cointegration Ha: All panels are cointegrated		
Test	**Statistic**	**p-value**
Modified Dickey-Fuller-t	6.667	0.000
Dickey-Fuller-t	-24.241	0.000
Augmented Dickey-Fuller-t	-27.159	0.000
Unadjusted modified Dickey- Fuller-t	-6.174	0.000
Unadjusted Dickey-Fuller-t	-33.998	0.000

Source: Elaborated by the authors.

TABLE B STATIC AND DYNAMIC ESTIMATES (JACKKNIFE REPLICATIONS)

	Jackknife method	
Model	**1***	**3***
Lag Transparency		0.535***
Education	6.485**	2.851
Mun_GDPP	2.056***	1.146***
Population	0.630*	0.363
Urban_Pop	-0.050***	-0.014
Pop_25-34	-0.403**	-0.632***
Pop_35-44	1.408***	1.304***
Pob_45-54	-0.469	-0.954***
Pob_55-64	0.368	0.465
Pob_65-74	1.392***	0.520*
Pob_75+	-1.070**	-0.237
Women_perc	0.344**	0.089
Turnout	-0.037*	0.022*
Perc_Win	0.019	0.013
Elect_year	1.142***	2.769***
Payment capacity	0.062**	-0.001

Continue

	Jackknife method	
Model	1*	3*
Fiscal_autonomy	0.126***	0.056**
Conservador	0.533	-0.136
Liberal	-0.140	-0.493
Part_U	0.095	-0.761
AICO	-0.935	-1.695
ASI	0.100	-1.380***
POLO	2.486	0.052
Afrovides	-1.718	0.256
Alianza_Verde	-0.682	-0.691
Cambio_Rad	-0.535	-0.525
Cent_Democrático	-2.035*	-0.684
MAIS	-2.084	-3.456
MIO	1.221*	0.309
MIRA	5.175***	-1.231
Opc_ciudadana	-4.849***	-3.634**
PIN	-2.222*	-1.585**
Coalition	-0.801	-0.420
Capital	3.780	3.884*
Number of observations	5497	4397
r2	0.971	
Arellano-Bond test for AR(1)		0.000
Arellano-Bond test for AR(2)		0.336
Hansen test of overid. Restrictions		0.351

Note: Significance levels: * 0.05 ≤ p-value < 0.10; ** 0.01 ≤ p-value < 0.05; *** p-value < 0.01.

Source: Elaborated by the authors.