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Institutional Development in Main Colombian Cities: What Is Its Relation to Subjective Poverty?

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Abstract

Since a peace treaty in 2016, Colombia has faced a significant challenge to reduce poverty and strengthen its institutions. A few studies have analyzed the relationship between institutions and subjective poverty, but none has demonstrated this influence in the Colombian context at a municipal level. This article estimated a logit regression including a cluster effect to evidence the influence of municipal institutions over perceptions of poverty by the inhabitants of twelve main cities in Colombia in 2016. Findings include that having a better rule of law and fiscal performance, reducing political fragmentation to have better governance, guaranteeing property rights, fostering the benefits of metropolitan areas, and improving citizen participation reduce the probability of feeling poor.

Keywords: institutional development; subjective poverty; Colombia; urban perception; metropolitan area

Resumen

Desde el tratado de paz en el año 2016, Colombia ha enfrentado un desafío importante para reducir la pobreza y fortalecer sus instituciones. Son pocos los estudios que analizan la relación entre instituciones y pobreza subjetiva, y ninguno de ellos demuestra esta influencia en el contexto colombiano a nivel municipal. Por ello, este trabajo estimó una regresión logit con efecto clúster para evidenciar la influencia de las instituciones municipales sobre la percepción de pobreza de los habitantes de doce ciudades principales de Colombia en el año 2016. Esta investigación encontró que tener un mejor imperio de la ley y desempeño fiscal, reducir la fragmentación política para tener una mejor gobernabilidad, garantizar los derechos de propiedad, fomentar los beneficios de las áreas metropolitanas y mejorar la participación ciudadana reducen la probabilidad de sentirse pobre.

Palabras clave: desarrollo institucional; pobreza subjetiva; Colombia; percepción urbana; área metropolitana

At the end of the twentieth century, many countries were concerned about reducing poverty. They focused efforts on promoting economic growth and mitigating environmental problems. However, they forgot other human dimensions. In this sense, evaluating progress demanded new development and holistic indicators to understand actual public policy impacts. The United Nations has proposed many metrics-based initiatives, such as the Human Development Index (since 1990), the Millennium Development Goals

(since 2000), the World Happiness Report (since 2012), and the Sustainable Development Goals (since 2015).

Within the UN guidelines, Colombia has also invested its efforts to reduce poverty (Departamento Nacional de Planeación [DNP] 2006, 2011; López and Núñez 2007) while facing the challenges of achieving peace in the country after a prolonged irregular armed conflict of more than fifty years (Yaffe 2011). Although Colombia may be more governable than before the agreement, there are still many points to be overcome to improve Colombians' perceptions of welfare and, thus, citizens' perceptions of their own well-being (Stoller 2018). Unfortunately, these attempts have not effectively tackled the root causes of social inequality (Ramírez-Orozco 2013) or other violent factors (Lupu 2020; Moreno León 2021). Analyzing solely monetary indicators is not enough to highlight where efforts can be focused to achieve a possible solution, as there are other factors that need to be developed to overcome the feeling of poverty (Aguado-Quintero et al. 2010; Niño-Muñoz and Morera-Ubaque 2018; Piñeros López and Clavijo Abril 2015; Piñeros and González 2015; Pinzón Gutiérrez 2017; Tobasura Jiménez and Casas Herrera 2017). People need social, economic, political, and cultural opportunities to achieve their desired state of living and thus assess satisfaction or dissatisfaction with their living conditions. Nevertheless, individual perceptions could be influenced by the characteristics of the city in which people live. Following Tollefsen (2020) and Korosteleva and Stepień-Baig (2020), this article assumes that having better institutional development in a city can also reduce perceptions of poverty of its citizens. In this sense, an institutional analysis of Colombia can guide efficient public policies and enhance the pathway to peace in the country. To do this, this article estimates the influence of six municipal institutions on perceptions of poverty as reported by inhabitants of twelve main cities in Colombia in 2016. The hypothesis is that better institutions reduce the probability that inhabitants report feeling poor (see details in later sections).

Theoretical framework

Subjective poverty

Since the 1970s, subjective poverty (SP) has been used to measure individuals' perceptions of the deprivation of their situation (Kuivalainen 2014). Addressing SP implies that people can judge their own poverty status (Wang et al. 2020). In this regard, there are several ways to inquire about SP. The first asks for people's perceptions about feeling poor by asking, "Do you feel poor?" (Kuivalainen 2014). According to Flik and van Praag (1991), there are other questions as follows. The Income Evaluation Question (IEQ), devised by van Praag (1971), used a Likert scale to examine the perception of family income after taxes: "Under my/our conditions I would call an after-tax household income very bad, bad, insufficient, sufficient, good, or very good" The Minimum Income Question (MINQ), introduced by Goedhart et al. (1977), defines that a family is poor if its income is not enough to meet its needs: "What do you consider as an absolute minimum net income for a household such as yours?" Finally, the Centre for Social Policy combined the Minimum Income Question's method with the intent of the Income Evaluation Question (Deleek and van den Bosch 1992): "Can you make ends meet with the actual net income of your household with great difficulty, with difficulty, with some difficulty, rather easily, easily, or very easily?"

All these questions examine a person's feeling of poverty in a particular context. Characteristics such as background, location, family, and social roles, among others, can influence that psychological perception. These determinants can be categorized into three groups: internal, external, and misfortune (Palomar-Lever 2013). The first is related to the intrinsic characteristics of people, such as health and education levels. External factors are related to the nearby and daily neighborhood context or a more general

and distant context such as a country's circumstances (Galster and Killen 1995). The last one is fatalistic, related to bad luck. This study focuses on the external factors, specifically the institutional context.

Studies about SP can be broadly divided into three large groups. The first group analyzes the perception of feeling poor in a specific country, state, or city (Alem, Köhlin, and Stage 2014; Asadullah, Xiao, and Yeoh 2018; Asadullah and Chaudhury 2012; Herrera, Razafindrakoto, and Roubaud 2008). The second one compares objective and subjective poverty (Albert and Hajdu 2020; Posel and Rogan 2016; Ferrer-i-Carbonell and van Praag 2001; Siposne Nandori 2014; Ayllón and Fusco 2017; Mahmood, Yu, and Klasen 2018; Wang et al. 2020; Mysíková et al. 2019). The last group incorporates the pioneers and their followers who theorized about the poverty line and the metrics to measure it (van Praag 1971; Flik and van Praag 1991; Deaton 2010; Pradhan and Ravallion 2000; Ravallion 1994; Ravallion 1998; de Vos and Garner 1991; Goedhart et al. 1977). All three groups seek to contribute to poverty identification and policy design.

Most publications on SP in Latin American countries began in the first decade of the twenty-first century. They focused mainly on the distinction between objective and subjective poverty (Gori Maia and Buainain 2011; Ortiz-Pech, Álvarez-Marchan, and Albornoz-Mendoza 2019; Rojas and Jiménez 2008) and the estimation on SP in a specific country and the calculation of subjective poverty lines (Alaña, Salomón, and Salinas 2003; Giarrizzo 2006; Monge and Winkelried 2001). Other studies compared different countries in the region on perception of poverty (Aguado-Quintero and Osorio-Mejía 2006; Herrera, Razafindrakoto, and Roubaud 2007). Most recent publications focus on subjective well-being (Asadullah and Chaudhury 2012). However, none used the survey of the Latin American Network for Just, Democratic, and Sustainable Cities and Territories as an instrument to analyze the relationship between institutions and poverty perception from an urban perspective. The studies with this survey in Mexico (Luna Salazar 2016), Argentina (Martiarena and Amione 2013), and Ecuador (Aynaguano Ajo and Caguano Ñamo 2016), did not include SP nor institutional development. Thus, the present article allows for the possibility of comparing different Latin American cities in future works with an institutional and SP perspective.

In Colombia, studies of SP are also relatively recent (Castillo, Castro, and González 2011; Niño-Muñoz and Morera-Ubaque 2018; Pinzón Gutiérrez 2017, Piñeros López and Clavijo Abril 2015; Piñeros and González 2015; Tobasura Jiménez and Casas Herrera 2017). Some studies have estimated the probability of citizens' feeling poor by analyzing simultaneously variables such as income, homeownership, possession of goods, educational level, living in a urban area, health condition, employment (Niño-Muñoz and Morera-Ubaque 2018; Piñeros and González 2015), satisfaction with public services, and children's age (Castillo, Castro, and González 2011). Another study calculated the subjective poverty line in Tunja, the capital city of Boyacá, a Colombian department (Tobasura Jiménez and Casas Herrera 2017). Besides, Piñeros López and Clavijo Abril (2015) evidenced a positive relationship between the subjective approach and the different components of objective poverty, such as food security and income level. However, none considers the institutions in their analysis.

Institutions

This article defines institutions as formal and informal rules that can shape the behavior of individuals and organizations in society. On the one hand, formal institutions are understood as rules, laws, constitutions, and mechanisms to enforce contracts (North 1990). On the other hand, informal institutions are norms of behavior, conventions, and self-imposed codes of conduct (Straub 2000). Besides, institutional mechanisms are essential to shaping political, economic, and social interaction and interdependence in the decisions of agents (North 1991). But it takes time to embed informal institutions

in social behavior and the formation of social ties (Sampson, Raudenbush, and Earls 1997). There is a bidirectional relationship between individuals and institutions (Watson, Chemers, and Preiser 2001). Institutions can change individual behavior and perceptions; likewise, social efforts can shape some institutions (Sampson, Raudenbush, and Earls 1997).

Some studies demonstrated that a robust institutional framework is a pillar for development (Assane and Grammy 2003; Acemoglu, Johnson, and Robinson 2001; Haapanen and Tapio 2016; North 1990; Mauro 1995; Scully 1988). And better institutions are usually associated with lower objective poverty rates (Bastiaensen, De Herdt, and D'Exelle 2005; Cepparulo, Cuestas, and Intartaglia 2017; Dewilde 2014; Tebaldi and Mohan 2010). In this sense, institutional quality is an essential factor in evaluating the degree of progress that societies or individuals enjoy (Cotler 2011; Spruk and Keseljevic 2016). Thus, it is reasonable to think that strengthening formal and informal institutions can also reduce perceptions of poverty.

Some studies address the relationship between institutions and poverty or SP. Herrera and colleagues (2007) compared household surveys in twelve African and Latin American developing countries to show the inclusion in surveys of new metrics on governance, democracy, and poverty. They reviewed both objective and subjective data and demonstrated its analytic potential. Korosteleva and Stepień-Baig (2020) explored the relationship between poverty alleviation, entrepreneurship, and gender. They estimated a multilevel ordered probit using subjective and objective measures of poverty and institutional quality as a national control variable. Palomar-Lever (2013) theorized about the subjective dimension of poverty from a psychological viewpoint, including a few institutional reflections. Tollefsen (2020) researched the nexus of local poverty and internal conflict. He employed a novel measure of SP and demonstrated that poverty is more likely to exacerbate violence in local areas if there is a low perception of institutional quality. Asadullah and Chaudhury (2012) correlated absolute and relative income with subjective well-being in Bangladesh, considering poverty as one determinant. They evidenced that better institutional quality and lower poverty matter for well-being. However, none of these studies has demonstrated that some economic, political, and social institutions are determinants of feeling poor, and less so in Colombia.

For Colombia's context, no studies evidence the relationship between SP and institutions. Ruiz Agudelo (2016) timidly includes a formal institutional approach in his study about the relationship between a better state of biodiversity and lower objective poverty levels. Ruiz Agudelo highlights the importance of having robust institutional incentives in rural areas, such as rural reform, better regional and environmental planning, and an institutional framework to foster participation.

Some studies conducted in Colombia have emphasized the importance of institutional arrangements to strengthen development with a regional perspective (Bayona Sarmiento 2016; Roperio Beltrán 2016; Parada Corrales 2013; Chitivo 2017; Lefevre et al. 2014; Lotero Contreras, Gómez Vargas, and Arcila 2008; Niño-Muñoz 2015a; Schejtman and Berdegue 2004; Restrepo and Clavé 2019; Franz 2019; Vergara Varela 2018). Nevertheless, they did not address its implications for SP, and less so in Colombian city systems. From an international scope Ramírez de la Cruz (2012) and Williams (1999) studied institutional capacity in city systems such as metropolitan areas.

Given the territorial importance in institutional studies, the metropolitan area is a key institutional arrangement of urban development. Living in a city with a metropolitan structure, understood as a regulatory framework to facilitate association between municipalities to improve living standards, could change perceptions about the opportunities for its citizens (Galster and Killen 1995). This regional aspect was also included because the interaction and articulation between cities is a central bet of Colombian governments for increasing economic growth, improving regional and national competitiveness, and promoting quality of life since 2010 (Samad, Lozano-Gracia, and Panman 2012; Samad

et al. 2015). It is worth highlighting that the metropolitan area is the most developed structure included in Colombian regulation. Unfortunately, the country should still foster a desire for efficient cooperation and reform its legal framework to avoid obstacles against association (Alfonso 2014; Lefevre 2014; Pavani and Estupiñán Achury 2016; Hernández Bonivento 2017). Besides that, the territory is also a crucial factor for people to interact and develop their social, political, cultural, and economic structures. Furthermore, sometimes, in this interaction, individual behavior is vital for the successful application of public policies (Kirkman, Noonan, and Dunn 2012) to increase well-being.

Currently, the formal institutional framework for these areas is based on Article 319 of the National Constitution and territorial organic law (Law 1454 of 2011). It is intended to promote autonomy, decentralization, and planning administration in territorial entities and metropolitan areas. Together with Law 128 of 1994 and other subsequent regulations, these norms allow for the consolidation of metropolitan areas, recognizing the importance of creating territorial integrations to strategically invest public resources and promote greater competitiveness within each metropolitan area.

Method and materials

This article used the surveys for 2016 published by the Red Colombiana de Ciudades “Cómo Vamos” (2019) (RCCCV, or “How We’re Going” Colombian Cities Network), an NGO that publishes reliable and impartial information about the quality of life and urban sustainability. Also, this network is the forerunner of the Red Latinoamericana por Ciudades y Territorios Justas, Democráticas y Sustentables, which replicated the Colombian initiative in Argentina, Bolivia, Brazil, Chile, Ecuador, Mexico, Paraguay, Peru, and Uruguay, reaching seventy municipalities in total.

The present article used the data of twelve main cities: Armenia, Barranquilla, Bogotá, Bucaramanga, Cali, Cartagena, Cúcuta, Ibagué, Manizales, Medellín, Pereira, and Santa Marta. More than one-third of the Colombian population lives in these cities. Most of the variables are categorical, between 0 and 1 or on a Likert scale. These surveys are mostly available for the years 2012–2016. However, the sample is anonymized and changes yearly; therefore, it is impossible to build a data panel. This study concentrates its efforts on 2016 as the year in which most cities responded to the survey, and because of its historical significance: the Colombian government signed a peace agreement with the Revolutionary Armed Forces of Colombia (FARC by its Spanish abbreviation), one of the biggest illegal armed groups in the country, after more than a half a century of irregular armed conflict. Table 1 displays the number of surveys carried out in each city. For 2016, RCCCV collected 12,768 surveys.

Table 1. Distribution of surveys by city.

City	# Surveys	Metropolitan
Armenia	750	0
Barranquilla	1252	1
Bogotá, DC	1502	0
Bucaramanga	750	1
Cali	1250	0
Cartagena	1009	0

(Continued)

Table 1. (Continued)

City	# Surveys	Metropolitan
Cúcuta	1000	1
Ibagué	1001	0
Manizales	1000	0
Medellín	1504	1
Pereira	1000	1
Santa Marta	750	0

Source: Red Colombiana de Ciudades Cómo Vamos (RCCCV 2016).

Notes: 1 = is a metropolitan city; 0 = not a metropolitan city.

The present study assumed that people living in the same city were likely to have similar perceptions, which would violate the basic principle of independence of observations in the classical regression model since they would not be independent of each other (Álvarez-Sousa 2016). To know if the nesting of observations by the municipality level is relevant to explain my model, an empty model (M0) was also estimated, with the dependent variable (SP_{im}) and the municipality level (code of the city), but excluding all independent variables (Equation 1):

$$SP_{im} = \gamma_{00} + u_{0m}, \quad (1)$$

where γ_{00} is the mean corresponding to all aggregate groups (municipalities), and u_{0m} reflects each municipality's distance from that mean (Cebolla Boado 2013). The intraclass correlation coefficient (ICC) was estimated to understand the variability between municipalities if compared with citizens of the same city. M0 estimated the explained variance ($\sigma^2 u_0 = 0.11$). To calculate this estimation in multilevel logistics models, we followed the method suggested by Rabe-Hesketh and Skrondal (2013) and Manzano, Mohor, and Jiménez (2020) (Equation 2). The denominator is the total residual variance, and π is pi:

$$ICC = \rho = \frac{\sigma^2 u_0}{(\sigma^2 u_0 + \pi^2/3)} = 0.0494 \quad (2)$$

According to Raudenbush and Bryk (2001), ICC values between 5 and 20 are statistically significant. In this case, factors related to the municipalities explained only about 5% of the variance of the dependent variable and did not justify estimating a multilevel model.

Inspired by Asadullah and Chaudhury (2012), the present research estimated a logit model represented in Equation 3 with a crosscutting regression for twelve Colombian cities. And the standard errors are corrected to review levels of significance after including a cluster effect. This process is applied to eliminate the problem of violating the assumption that the residues are independent by showing that within each city they are not independent:

$$P(SP_{im} = 1) = \beta_0 + \beta_1 X_{im} + \beta_2 DL_{im} + \beta_3 I_m + \beta_4 Z_m + \varepsilon_{im} \quad (3)$$

In Equation 3, SP_{im} is the subjective poverty dimension, measured as the perception of feeling poor for individuals (i) residing in each of the selected municipalities (m). The variable SP is captured in RCCCV's surveys by the question, "Could you tell me if you consider yourself poor?" Following Niño-Muñoz (2015a), I_m is a vector of institutions that each municipality presents. Regarding this institutional level, variables about the rule of law, political fragmentation, fiscal performance, property rights, and citizen participation were incorporated. Also, Z_m is a dummy to evidence whether the city is part of a metropolitan area (1 indicates yes). Each institutional variable is explained in Table 2. As control variables, X_{im} is a vector of some individual characteristics (i) such as stratum, age, and gender.

Table 2. Institutional variables.

Type of indicator	Institutions	Description	Indicator	Interpretation	Source
Metro	Metropolitan regulation	Metropolitan areas: Valle de Aburrá, Bucaramanga, Barranquilla, Cúcuta, Centro Occidente, and Valledupar	Metro: Binary variable	Where 1 means that it belongs to a metropolitan area and 0 that it does not belong.	According to the Law 1625 of 2013, in 2016 Colombia has constituted officially 6 metropolitan areas.
Political institutions	Rule of law	Capacity of the state to enforce the law in the territory and the compliance with the legal system	HR: Homicide rate per 10,000 inhabitants. $HR = 10000 * \frac{\Sigma \text{Number of homicides in the municipality}}{\Sigma \text{Population of the municipality}}$	The homicide indicator represents the rule of law by considering that the state must limit and control violence, and maintain order and security (North, Wallis, and Weingast 2009).	National Police (2016) Municipal population estimated in 2016 (DANE 2011).
	Political fragmentation	ENP (Effective Number of Parties) reflects the concentration or dispersion of decision-making power in municipal councils in 2015	$ENP = \sum_{i=1}^n \left(\frac{1}{p_i} \right)$, where p_i is the proportion of seats received by the parties in the municipal council elections.	According to Hoyos' classification (2005), an ENP between 1 and 1.6 shows a strong one-party system; between 1.6 and 2.0, an attenuated one-party system; between 2.0 and 2.7, a two-party system; and higher than 2.7, a system with a tendency to multi-party or multi-party.	Election statistics of the National Registry (Registraduría Nacional del Estado Civil 2015).

(Continued)

Table 2. (Continued)

Type of indicator	Institutions	Description	Indicator	Interpretation	Source
Economic institutions	Fiscal efficiency	Local government autonomy and good fiscal management in 2016	FPI: Fiscal Performance Index of each municipality developed by the Department of Sustainable Territorial Development (Dirección de Desarrollo Territorial Sostenible) (DNP 2005).	Average of the fiscal performance indices of each municipality measured by the Department of Sustainable Territorial Development (Dirección de Desarrollo Territorial Sostenible) (DNP 2005).	Budgetary execution of the municipalities of the National Planning Department (DNP 2016)
	Property rights	Burglary in 2016	BUR: the number of burglaries by the city for the year 2016	The higher the number of burglaries, the greater the insecurity to guarantee property rights. This institution was included when taking into account the contributions of Kaufmann, Kraay, and Mastruzzi (2005).	Ministry of National Defense (Ministerio de Defensa Nacional), National Police. Directorate of criminal investigation and INTERPOL (DIJIN, 2018).
Social institutions	Citizen participation	Citizen empowerment and the ability to demand accountability from their representatives and firms	CPR: Citizen Participation Rate for the 2016 plebiscite $CPR = \frac{\text{Total voters of each municipality}}{\text{Number of people of voting age in each municipality}}$	It is assumed that greater participation on plebiscites reflects greater citizen empowerment (Niño-Muñoz 2015b).	Election statistics of the National Registry (Registraduría Nacional del Estado Civil, 2015).

Source: Based on Niño-Muñoz (2015a).

And inspired by Pinzón Gutiérrez (2017), DL_{im} is a vector on the satisfaction or perception of some dimensions of life that are self-reported by individuals (i), such as health services, housing conditions, bodily integrity and safety, and commuting time. Both X_{im} and DL_{im} are explained in Table 3. Finally, the model presented a correctly classified 79% of participants.

Table 3. Variables linked to individuals and satisfaction or perception of some dimensions of life.

Variables	Question of RCCCCV	Interpretation
Dependent		
Subjective poverty	Self-perception of poverty. Could you tell me if you consider yourself poor?	This variable was set as 0 or 1, with 0 being not feeling poor and 1 feeling poor.
Independent		
Stratum	Socio-economic stratum	It is the stratum reported by the respondent, between 1 and 6. 1 meant the lowest stratum, and 6, the highest.
Age	How old are you?	The age ranges provided in the survey were as follows: from 8 to 25 (1); from 26 to 35 (2); from 36 to 45 (3); from 46 to 55 (4); over 55 (5).
Gender	Gender	This variable was set as 0 or 1; with 0 being male and 1, female.
Health	How satisfied are you in general with the health service you have received, using these options? You can use any number on the scale.	The satisfaction ranges provided in the survey were as follows: Very satisfied (5); Somewhat satisfied (4); Neither satisfied nor dissatisfied (3); Somewhat dissatisfied (2); Very dissatisfied (1); Did not receive (0).
Housing	How dissatisfied or satisfied are you with the home you live in? You can use any number from the scale of the defined options.	The satisfaction ranges provided in the survey were as follows: Very satisfied (5); Somewhat satisfied (4); Neither satisfied nor dissatisfied (3); Somewhat dissatisfied (2); Very dissatisfied (1).
Safety	How safe do you feel in your neighborhood? You can use any number on the scale.	The scale provided by the survey was the following: Very safe (7); Safe (6); Somewhat safe (5); Neither safe nor unsafe (4); Not very safe (3); Somewhat unsafe (2); Not safe at all (1).
Victim	During the last year, have you been a victim of any crime in [CITY]?	This variable was set as 0 or 1, 0 for not being a victim, and 1 being a victim
Crime	You consider that the probability that a crime will be punished in [CITY] is . . .	The rating ranges provided in the survey were as follows: Very high (5); High (4); Average (3); Low (2); Very low (1).
Culture	How satisfied are you in general with the cultural offer of the city? You can use any number on the scale	The satisfaction ranges provided in the survey were as follows: Very satisfied (5); Somewhat satisfied (4); Neither satisfied nor dissatisfied (3); Somewhat dissatisfied (2); Very dissatisfied (1).
Commuting	Do you perceive that, in general, your usual trips or routes take the same time, long time, or less time than last year?	The rating ranges provided in the survey were as follows: Longer time (3); The same time (2); Less time (1).

Source: Red Colombiana de Ciudades Cómo Vamos (RCCCCV 2019).

Results

I analyzed 12,768 observations distributed among twelve cities. As Table 4 shows, 22% of respondents considered themselves poor. On average, the surveyed individuals fell slightly below the middle socioeconomic stratum; almost 56% of them were from the second and third strata. Most of the respondents were between the ages of thirty-six and forty-five. There was also a relatively equitable distribution between men and women (50% female), and between nonmetropolitan cities and metropolitan cities (43% metropolitan).

Table 4. Summary table of variables.

Variable	Mean	Std. Dev.	Min	Max
SP	21.80451%		0	100%
Stratum	2.720081	1.339566	0	6
Age	3.101347	1.496579	1	5
Gender	49.96084%		0	100%
Metro	43.12343%		0	100%
Health	3.205435	1.517093	0	5
Housing	4.312422	0.928085	1	5
Safety	5.243813	1.728226	1	7
Victim	18.1156%		0	100%
Crime	2.309445	1.219036	0	5
Culture	3.615523	1.045214	1	5
Commuting	2.218907	0.7617982	0	3
HR	2.716233	1.133926	1.586466	5.348811
ENP	4.841893	1.652361	1.938152	8.366719
FPI	79.11864%		74.92%	82.5%
BUR	905.1634	1034.619	209	3663
CPR	41.6508%		21.39275%	57.99671%

For the total observations, the average satisfaction with the health service was neither satisfied nor dissatisfied. On average, survey respondents were satisfied with their housing conditions. Regarding safety, people reported feeling somewhat safe in their neighborhoods, and there were a few cases in which they reported having been the victim of a crime. However, the perception of an efficient justice in the wake of experiencing a crime is below the national mean (2.5). Respondents were satisfied with the city's cultural offerings (*culture*) and reported that their daily commuting time remained constant compared with the year before.

At the municipality level, Colombia faces a great challenge to improve its rule of law after its violent history of more than fifty years. However, the homicide rate (HR) of the studied municipalities in 2016 is closer to the national average per 10,000 inhabitants in the same year (2.55), the lowest rate in forty-two years. Regarding political fragmentation, the effective number of parties (ENP) reflects a great dispersion in council municipalities. According to Hoyos's scale (2005), an ENP greater than 2 implies that cities tend to have

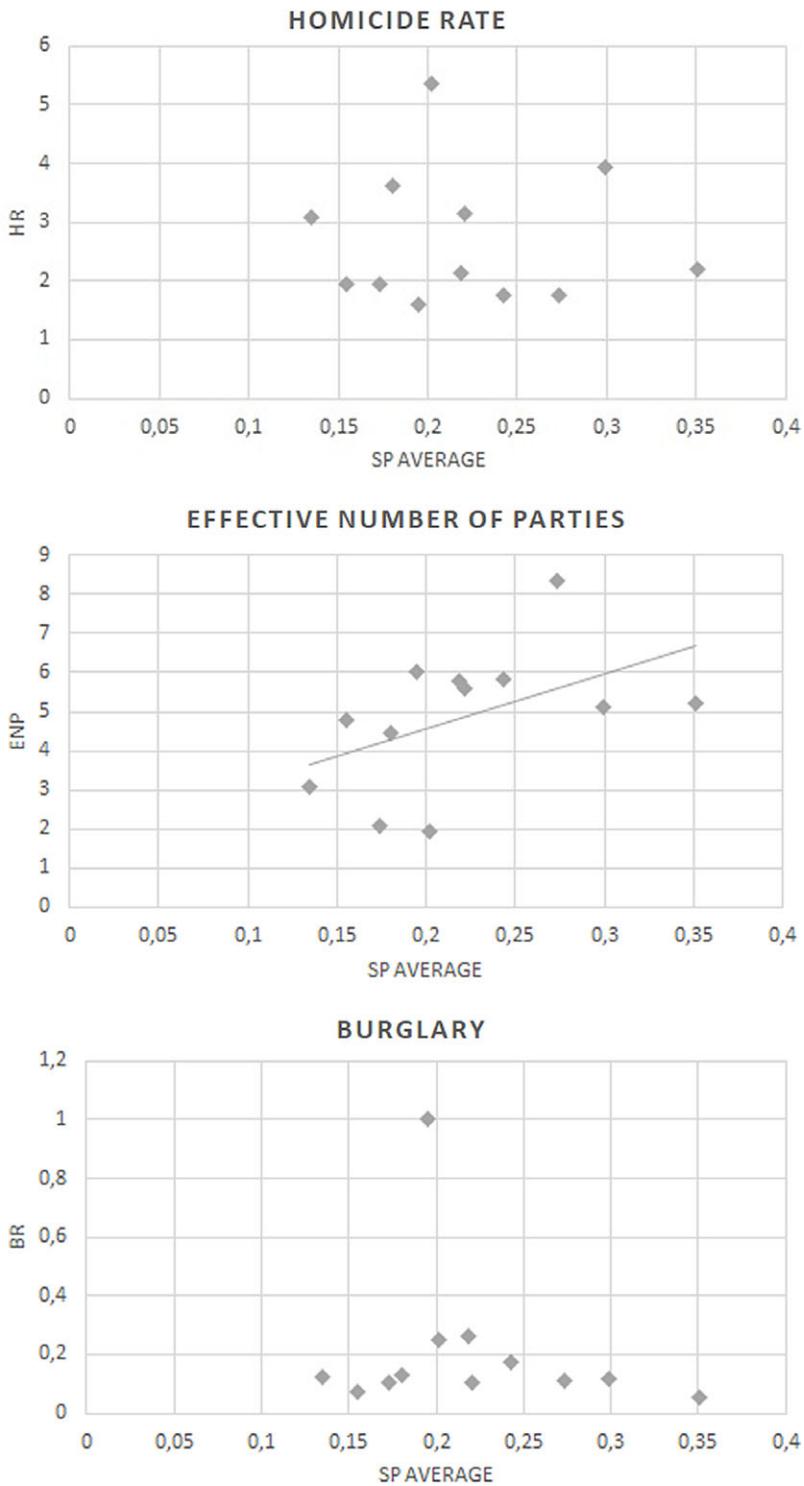


Figure 1. Scatterplot graphs between SP average and institutional variables by city.

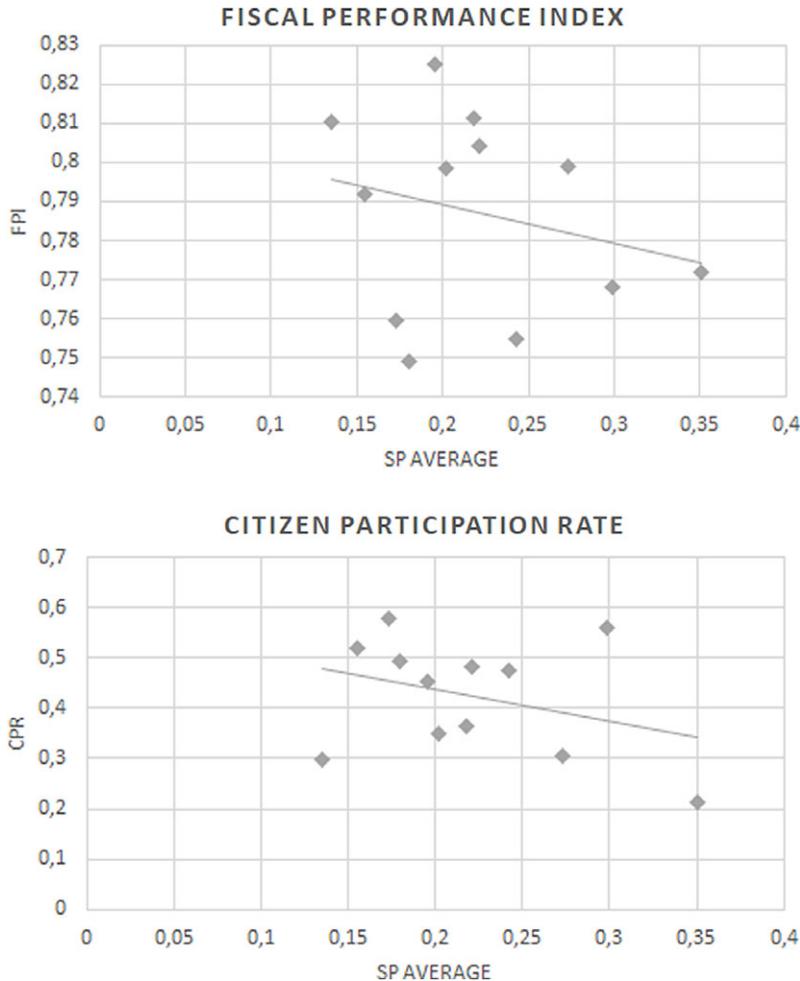


Figure 1. (Continued).

multipartyism. The mean of burglaries (BUR) is consistent with the citizen's perception of the security. On average, the fiscal performance index (FPI) of the municipalities is good (79 over 83%), as it is above the national average (67%). It reflects a healthy fiscal autonomy and adequate management. Finally, citizen participation (CPR) is only a little above the national average (42% versus 39%).

To finish this data description, I drew the SP average by municipalities versus institutional variables in Figure 1. These scatterplot graphs reveal that political fragmentation has a positive relationship with SP. It also shows that fiscal performance and citizen participation have an inverse relationship with SP. Visually, the relationship between SP and some institutions like rule of law and burglary are not conclusive. Thus, I calculated the correlation matrix with significance level for each entry, which confirmed previous findings. At a 99.9% confidence level, ENP has a positive relation (0.0637), and FPI and CPR have a negative one (-0.0480 and -0.0362, respectively). However, calculating the average of poverty perceptions by the city could shade the strength of those relationships, which I showed with the logit model.

Table 5 condenses the results of the estimation of the logit model. I interpreted column 6, which includes the cluster effect in the relationship of each individual variable with the PS at a 99% confidence level. The higher the social stratum, the lower the probability of feeling poor. Older people had a higher probability of perceiving themselves as poor. Factors such as being a woman, feeling satisfied with health service, and housing conditions decrease SP probability. An increased feeling of safety in one's neighborhood reduces the probability of poverty perception. This is consistent with the results about being a victim and the perception of an efficient justice when someone faces a crime. Both increase the probability of SP at a 95% and 90% confidence level respectively.

Table 5. Logit model with standard errors adjusted for twelve cities.

Variable (1)	Coefficient (2)	Std. Err. (3)	P> z ₁ (4)	Robust Std. Err. (5)	P> z ₂ (6)
Stratum	-0.2457514	0.0184986	0.000	0.0327042	0.000***
Age	0.3246613	0.015957	0.000	0.0242514	0.000***
Gender	-0.1974694	0.0451976	0.000	0.0613337	0.001***
Health	-0.0633667	0.0152334	0.000	0.0186169	0.001***
Housing	-0.3148147	0.0232676	0.000	0.0435301	0.000***
Safety	-0.0618841	0.0134251	0.000	0.0184663	0.001***
Victim	0.1502362	0.0595074	0.012	0.060329	0.013**
Crime	0.0427421	0.0188886	0.024	0.0227396	0.060*
Culture	0.0079842	0.0223174	0.721	0.0238546	0.738
Commuting	-0.0571432	0.0295633	0.053	0.0375455	0.128
HR	0.1133625	0.0273179	0.000	0.0689332	0.100*
ENP	0.1730084	0.0185481	0.000	0.0504914	0.001***
BUR	0.000115	0.0000377	0.002	0.000038	0.003***
FPI	-9.811768	1.589148	0.000	3.451525	0.004***
CPR	-1.534324	0.2759225	0.000	0.6864899	0.025**
Metro	0.1747987	0.0606965	0.004	0.1028195	0.089*
_cons	7.269974	1.274859	0.000	2.736815	0.008***
N	12768				
Correctly classified	78.67%				

* $p < .1$. ** $p < .05$. *** $p < .01$.

Regarding the institutional level, an increase in homicide rate (HR), effective number of parties (ENP), and burglary (BUR) raise the probability of SP. This same relationship is found by being part of a metropolitan area (Metro). In other words, strengthening the rule of law, consolidating political fragmentation to have better governance, guaranteeing property rights, and enjoying the benefits of metropolitan areas reduce the probability of feeling poor. Finally, a better fiscal performance index (FPI) and higher citizen participation (CPR) reduce the probability of poverty perception. These last institutional factors in magnitude contribute at most to understanding the reduction of SP probability. ENP, BUR, and FPI are statistically significant at a 99% confidence level, citizen participation (CPR) at 95%, and HR and Metro at 90%.

Discussion

When analyzing the institutional context of the municipalities, some relevant factors can be extracted. First, strengthening the rule of law and property rights reduces the probability of poverty perception. Ensuring a low homicide rate could represent rule of law (Niño-Muñoz 2015a), considering it reflects the state's capacity to limit and control violence and maintain order and security (North, Wallis, and Weingast 2009). Likewise, a low level of burglary reflects respect for property rights, essential to economic efficiency (North 1989). The better those dimensions, the greater the confidence and respect in rules (Kaufmann, Kraay, and Mastruzzi 2005). Thus, if citizens increase compliance in the legal and economic systems, poverty perception (Korosteleva and Stępień-Baig 2020) or objective poverty (Tebaldi and Mohan 2010) could also reduce.

Second, it is interesting that political fragmentation increases the probability of SP. Historically, Colombia had a very marked two-party system (liberals and conservatives) until 1991 when the constitution introduced a multi-party system. It allowed an important increase of electoral microenterprises, but most of them were recognized as fractions of the traditional parties making impossible a real increase in representation (Basset 2018). In 2003, the country reached another political reform to allow the consolidation of five to seven main actors. But once again, parties followed the bipartisan ideology in the territories (Basset 2018). However, elections of senators in 2014 suggest that the liberal-conservative dynamic was replaced by a center-periphery approach (Basset 2018). Colombia was divided between the government efforts to advance a peace process with the guerrilla and the demands of the opposition parties to have greater punishments for this armed group. Expectations and fears regarding the peace process in the country were segmented. Some Colombian cities from the center perspective were more aligned with the tough stance, while municipalities in the periphery tended toward negotiations (Basset 2018).

In this context, an increase in political fragmentation would generate more uncertainty regarding the peace process, more discussions, and a higher cost to carry out a legislative agenda. The higher controversy could translate into less governance. Thus, having more parties could increase representativeness, but it also makes political decision-making more difficult. It maintains the status quo and diminishes the opportunities to effectively get changes that benefit the community (Uribe López 2009). With this panorama, it would reasonably be expected that an increase in political fragmentation in 2016 could be related to a pessimist expectation of effective social changes, and thus a higher probability of poverty perception.

Third, a better fiscal performance reduces people's probability of SP. When taxes are efficiently utilized, it reflects a better social investment and planning, which could change the perception of the city. Moreover, if the country could increase fiscal transparency, reducing corruption, it would positively impact the efficiency of public institutions and contribute to SP reduction (Herrera, Razafindrakoto, and Roubaud 2007). In the present article, fiscal capacity has been shown as the highest magnitude to improve poverty perception probability, highlighting its relevance.

Fourth, better citizen participation reduces the probability of poverty perception. Social and organizational characteristics are not only attributable to the aggregated demographic feature of individuals, but there is also the capacity of a group to regulate and control their performance to achieve collective goals, in other words, to improve collective efficacy (Sampson, Raudenbush, and Earls 1997; Watson, Chemers, and Preiser 2001). This social commitment allows to achieve some institutional changes (Kirkman, Noonan, and Dunn 2012) and shows citizens' concerns about their cities (Niño-Muñoz 2015a). Although these types of changes require time and empowerment to make them sustainable, it is important to highlight that citizen participation actually could improve prospects for

prosperity and reduce SP (Herrera, Razafindrakoto, and Roubaud 2007; Korosteleva and Stepień-Baig 2020).

Fifth, being part of a metropolitan area could improve the probability of poverty perception by promoting economic, and social cooperation between municipalities to achieve common development and offer shared public service to their citizens (Law 128 of 1994, article 1). The success of this union of cities depends on organizing themselves around a single objective by coordinating their economic, social, political, institutional, and cultural interactions, among other dimensions (Kirkman, Noonan, and Dunn 2012).

But once again, there is a bidirectional responsibility (Sampson, Raudenbush, and Earls 1997; Watson, Chemers, and Preiser 2001). Some metropolitan policies need individual commitment, especially in environmental issues (Kirkman, Noonan, and Dunn 2012) or public health policies such as those arising from COVID-19. And to embed a rule in the society and have an impact on citizens' perception, people first need to empower themselves with them. Cities also need instruments to reinforce the consensus with their citizens and the mechanisms the city uses to associate with other municipalities. As Pavani and Estupiñán Achury (2016) explained, associativity cannot be the only strategy to foster territorial development in Colombia. Those mechanisms should be reviewed because Colombia does not have sufficient regulations on the subject, nor does it have the resources to make different associative schemes effective, where the metropolitan areas stand out (Pavani and Estupiñán Achury 2016). It also requires decades of collaborative culture building and actual incentive policies (Pavani and Estupiñán Achury 2016; Hernández Bonivento 2017). Colombia needs to improve its institutional design and reinforce its informal institutional structure (Ruiz Agudelo 2016; Roperó Beltrán 2016; Bayona Sarmiento 2016; Niño-Muñoz 2015a, 2015b).

Finally, the present study also evidences the relationship between the probability of feeling poor and the satisfaction or perception of some dimensions of life, such as health service, housing conditions, safety, being a victim, the efficiency of justice, and commuting. Niño-Muñoz and Morera-Ubaque (2018) and Piñeros and González (2015), who estimated the relationship between SP and individual characteristics and perceptions for the Colombian context, found similar results.

Conclusions

Although Colombia needs to advance in institutional strengthening, the present study demonstrated the importance of starting with certain economic, political, and social institutions to reduce the probability of poverty perception at twelve main cities in the country. These institutions are strengthening the rule of law, consolidating political fragmentation to have better governance, guaranteeing property rights, fostering the benefits of metropolitan areas, having better fiscal performance, and having higher citizen participation.

The last two factors contributed most to understanding the reduction in the probability of SP. This might be because, both institutions impact citizens' daily conditions. Let me clarify this by saying that an improvement in fiscal management can translate into better public investments and, therefore, a better perception of living circumstances. Likewise, increasing citizen participation can translate to better organizing and execution of actions, and thus greater collective efficacy, and improve shared beliefs about poverty. But the formation of informal mechanisms to organize individual freedoms and achieve common goals with social ties takes time. Thus, it is important to build a culture of collaboration and trust.

Therefore, in future research, it is important to recognize the construction of social ties over time, which calls attention to the RCCCV survey on the importance of taking up questions that ask about actions people would take in "solidarity with others when they require

help,” “the main reason that motivates a person to participate,” or “to solve a problem that has affected the community.” The survey stopped asking these questions in 2015 and were answered for only a few cities.

The importance of citizen participation also reveals that the state is not solely responsible for institutional strengthening. There is a bidirectional dynamic to improving the institutional weakness observed in the review of Colombian institutional literature and embedding institutions in the main cities. On the one hand, there is an urgent need to consolidate institutional design and incentives. On the other hand, people need to collaborate with one another and empower themselves to organize them with the institutions in which they can actively participate or use, especially after all social challenges derived from the peace treaty in 2016.

Metropolitan areas also face big challenges. To foster the metropolitan areas' structure, the country must first empower its cities with associative mechanisms and fiscal autonomy. Although the metropolitan organization is the most developed territorial structure in Colombian laws, its benefits must be embedded within the daily perception of its inhabitants. Also, the limitations already identified for this type of institution require improving territorial coordination and planning, promotion of governance, government effectiveness, and social participation over time. In this sense, it is important to reform the urban master plan (POT, by its Spanish abbreviation) structure, to include collaboration tools between municipalities, the unification of budgets, and long-term pacts to allow the development of metropolitan projects to improve contexts of inequality between cities. It could be a way to give the Metropolitan Planning Council tools to act.

Finally, it is pertinent to deepen the relationship between institutional structures and perceptions of poverty. Future studies should incorporate more objective variables to replace subjective evaluations, show the coverage in health, measure commuting time, or indicate the city's insecurity. Likewise, future investigations could use fewer objective variables and include institutional perceptions about the local government administration's efficiency and transparency to demonstrate a relationship between this perception and SP. In addition, as the data used are found in other countries in the region, the present study contributes to future comparative studies among Latin American countries.

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