

A targeting policy for tackling inequality in the developing world: Lessons learned from the system of cross-subsidies to fund utilities in Colombia

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ABSTRACT

This paper contributes to the discussion on policies for providing utilities and on their contribution to reducing inequality. The uniqueness of the Colombian scheme to target subsidy beneficiaries and contributors provides valuable lessons for policymakers, academics, and urban planners regarding the difficulties and implications of such a segmenting government intervention in countries of the Global South. Among the unintended consequences of the scheme are deepening spatial segregation, distorted economic incentives, and poor correspondence of the welfare system with stratification categories.

1. Introduction

Among many other challenges, developing countries must provide utilities of basic quality to their populations in the context of scarce tax-collected resources. Moreover, in countries with high levels of inequality, policies on utilities' provision have become policy tools designed to reduce inequality. Therefore, identifying different population payment capacities as accurately as possible is critical for the implementation of this type of policy. In addition, the heterogeneity of subnational entities creates tension between standardized policies that in many cases do not reflect households' socioeconomic conditions and the cost-effective implementation of only one—undifferentiated—provision scheme. Thus, the policy problem of utilities provision is central to a comprehensive public policy strategy to address countries' inequality at both the country scale and subnational scales.

Colombia shares these characteristics—a high level of inequality, considerable subnational heterogeneity, scarce tax-collected resources, and practical challenges in the implementation stage. Therefore, we present the country's experience and lessons learned from the targeting policy providing cross-subsidies to fund utilities, which is referred to as stratification in Colombia. With twenty-seven years of implementation, the policy is currently in a redevelopment and redesigning phase led by the national government with the participation of experts from academia, nongovernmental organizations, and former public servants.

This process has been useful for not only acknowledging the policy's early benefits but also pointing out its several weaknesses; therefore, we can highlight these outcomes and present potential improvements for low- and middle-income countries with similar contexts. In the following sections, we describe the characteristics of stratification, identify weaknesses, and outline options for developing a new policy tool.

2. Colombia's unique context: providing cross-subsidies to fund utilities, better known as stratification

In the first half of the 1990s, Colombia experienced high levels of inequality with Gini coefficients of 0.51 and 0.56 in 1992 and 1996, respectively, poverty rates¹ of 23.1% and 32.4% in 1992 and 1996, respectively (Azevedo, 2019), and an urban/rural population distribution of approximately 70/30 in 1994. The latest information available for 2018 shows a Gini of 0.50, a poverty rate of 11.1%, and an urban/rural population distribution of approximately 80/20. The literature highlights the reduction of inequality as a structural challenge, acknowledges improvements in overcoming poverty, and underlines demographic changes in population geographic distribution (CEPAL, 2019; Gasparini et al., 2016).

For several decades, local governments were able to implement discretionary policies on public utilities in Colombia's cities. An effort to unify guidelines on public utilities funding and provision requirements

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¹ No data are available for 1994. Data measure the poverty headcount ratio at \$3.20 a day (2011 PPP) (% of population).

was achieved through the Colombian central government enacting Law 142 on *Public Utilities for Housing* (free translation) (Ley-142, 1994). Law 142 created a system of cross-subsidies to fund public utilities to ensure tax-like progressiveness, which involves charging high-income households more to reduce the cost to low-income households. The stratification classifies populations into six categories or strata (with 1 denoting the most vulnerable and 6 denoting the least vulnerable) based on houses' exterior physical characteristics and conditions of their immediate surrounding areas. Law 142 demands that stratification accomplishes economic, social, and accountability features, such as “solidarity, redistribution, financial sufficiency, economic efficiency, neutrality, simplicity, and transparency” (Article 3, Ley-142 (1994), free translation). Although other Latin American countries have cross-subsidies schemes (ADERASA, 2005), the specifics of Colombia's stratification have become a structural challenge to reduce inequality.

Stratification had early positive effects on utilities provision because of its fairly easy implementation based on houses' exterior physical characteristics and conditions of their immediate surrounding areas. A positive correlation between house characteristics and payment capacity served as the main argument to support this solution (DANE, 2015). Information for the classification was collected through field work conducted by a specialized group of professionals to identify house features. In the context of limited resources, this strategy was cost-effective and easy to implement. Nonetheless, an early assessment of the stratification, which focused on Bogota (Colombia's capital city), revealed a substantial mismatch between households' payment capacities and their stratification classification, especially for categories 1, 5, and 6 (Econometría, 1999). A new assessment conducted nine years later indicated that stratification contributes to better identification of subsidies beneficiaries; however, the approach has simultaneously allowed an excessive inclusion of possible taxpayers into the group of beneficiaries (Econometría, 2008).

The incorrect identification of taxpayers to the group of beneficiaries caused city governments to reach the maximum allowed percentages to subsidize each stratification category. This limitation placed stress on the cities' limited budgets, jeopardized their financial stability, necessitated more support from the central government, and created a tax-regressive system (Meléndez, 2008). In 2005, the Colombian government acknowledged the evident limitations of the stratification system, that the inclusion error—taxpayers identified as beneficiaries—represented approximately 58% of granted subsidies, and that 17% and 31% of the population living in houses classified under category 1

and category 2, respectively, were located in the highest income quintiles (4 and 5) (CONPES, 2005).

The widely accepted conclusion is that stratification loses its capability to identify and classify households' payment capacities over time because of its inability to reflect socioeconomic improvements from dynamic changes in the macroeconomic context. Although stratification methods have been updated (DANE, 2011, 2015), in Fig. 1, we show that the reduction in household poverty does not translate to substantial changes in stratification category because the percentage of households per stratification category remains virtually the same, reinforcing the main weak point of the stratification approach: its rigidity. Hence, this method is not capable of adapting to and reflecting population welfare improvements as macroeconomic changes occur.

In Fig. 2, we present the spatial distribution by stratum using census blocks from the three main Colombian cities: Bogota D.C., Medellin, and Cali (Chica-Olmo et al., 2020). Although cities worldwide have unique spatial clustering and segregation distributions (Florida & Mellander, 2015; Tammaru et al., 2015), in Colombia, stratification has strongly influenced the emergence and persistence of these phenomena (Bogliacino et al., 2015, 2018). In these three cities, we also observe another unintended consequence: jeopardized financial stability. Fig. 3 shows the three cities' trends for water and sewers, and electricity. In all cases, the downward trends suggest that in the medium term, cities reach a negative balance or an even more negative value for cities already in this situation.

Currently, more than two and a half decades after the stratification system was first implemented, its effects are assessed in economic, social, and geographic dimensions. The stratification limitations are distinct: difficulties in accurately assessing households' payment capacities, and hence, the system's tax regressivity; its inability to adjust to macroeconomic changes; and the financial tension between local governments and the central government resulting from the need for resources that address the growing number of subsidies for incorrectly identified beneficiaries.

3. Proposals to improve the system of cross-subsidies to fund utilities: rethinking a policy tool to contribute to reducing inequality

Although there is a consensus on the core problem, which is a lack of accurate identification of subsidy beneficiaries and contributors, proposals made by scholars on this issue vary and can be grouped into two

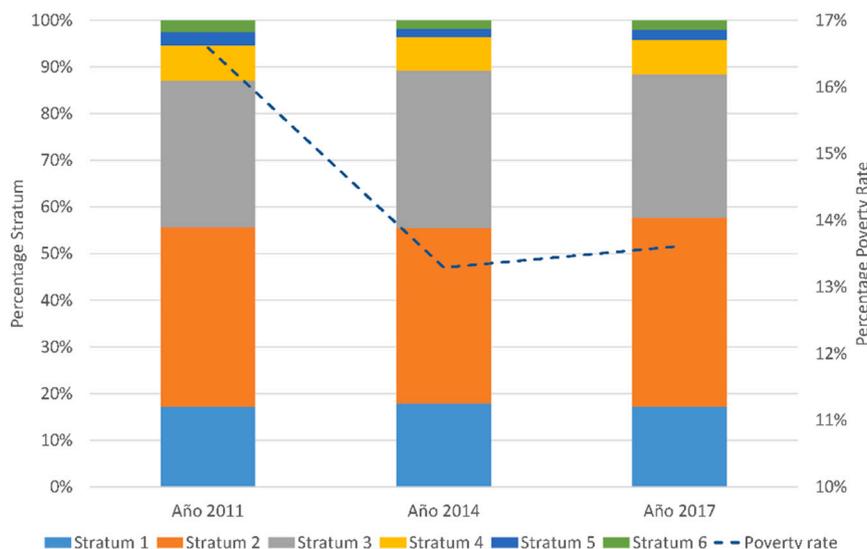


Fig. 1. Percentage of households per stratum and percentage of household poverty based on national measures, 2011, 2014, and 2017. Source: GEIH-MESEP 2017, Authors' calculations.

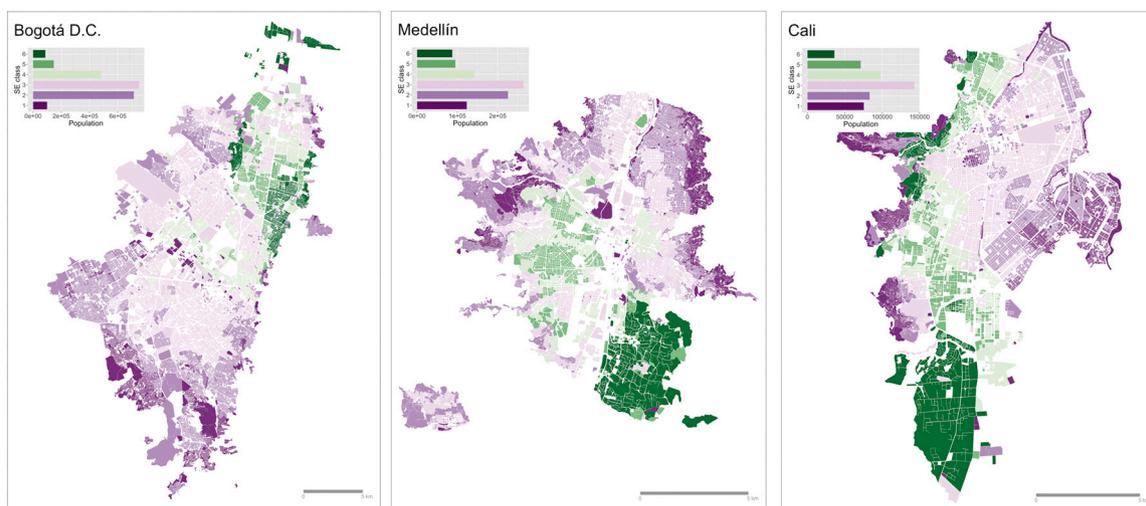


Fig. 2. Spatial distribution of stratum by census block in the three main Colombian cities. Source: Colombian Census 2018, Authors' calculations..

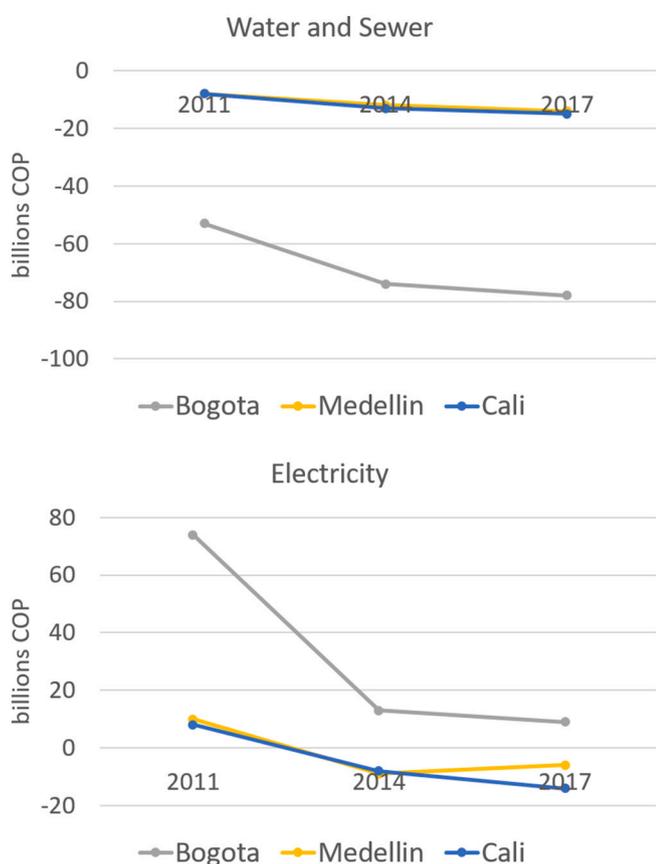


Fig. 3. Deficit (–) or surplus (+) balance of contributions vs. subsidies in billions of COP current prices for water, sewers, and electricity, 2011, 2014 and 2017. Source: SUI 2018, Authors' calculations.

perspectives. For the first perspective, proposals are still based on the external physical characteristics of households and cadastral variables (Sardi, 2008; Sepúlveda et al., 2014), while for the second perspective, identification is made using a multidimensional index with physical characteristics included as one of the dimensions (Maluendas, 2014; Meléndez, 2008; UN-Habitat, 2016). The former type of proposal argues that using cadastral variables can reach a correlation that can explain

approximately 74% of households' payment capacities and where implementation implies a smooth transition. The latter type of proposal covers dimensions such as employment, demographic composition, classification of wealth, and vulnerability. This perspective fundamentally focuses on individuals and their characteristics. Although this perspective's implementation is more demanding in terms of infrastructure, it takes advantage of large administrative databases and big data techniques for their manipulation. Simulations based on the multidimensional index have shown significant improvements in user identification for subsidizing utilities, especially for running water and sewer services in Bogotá.

4. Conclusions

We believe that the discussion of policies on utilities provision fits into the larger debate on comprehensive strategies designed to tackle higher levels of inequality in developing countries. Although subsidies for utilities, such as water and electricity, are commonly utilized worldwide to improve quality of life and reduce poverty (Komives et al., 2005), lessons learned from previous implementations, such as those adopted in Colombia, can help scholars and policymakers create policies in their particular contexts, because accurately identification of beneficiaries from utilities subsidies have proven being difficult to implement, inefficient, financially unsustainable, and more costly than other transfer programs (Alderman et al., 2002; Gilbert, 2004; Komives et al., 2005).

Using Colombia as a case study, we identified the main weak point of a policy based only on houses' exterior physical characteristics and conditions of their immediate surroundings, which lies in its rigidity, and therefore, its inability to accurately classify households' payment capacities over time. The stratification became obsolete very fast because it was not designed to adapt to a changing economic environment, which reflects the high percentage of inclusion errors. This outcome applies not only in times of positive economic growth but also times of negative economic growth, such as the post-Coronavirus Disease 2019 (COVID-19) era, when limited resources must be dedicated to people who need them the most.

We suggest that a system for providing utilities should accomplish tax progressiveness in capturing families' payment capacities (Quñones et al., 2020). There is no single scheme that can better operationalize the concept of payment capacity; however, some proposed schemes are better than other schemes in achieving this goal. Currently, efforts in Colombia are focused on implementing a new scheme with a performance superior to that of stratification because there is enough evidence

to believe that a better option is possible.

We also observed that the stratification effects on cities are very asymmetrical in several ways. Larger cities experience faster growth and socioeconomic improvement than smaller cities; therefore, more significant inclusion errors are more likely to occur in these cities. Larger cities have better knowledge endowments and logistical capacities than smaller cities, and they are still not able to follow the rate of their economic development through the institutional framework designed to correct inclusion errors, which can serve as a measure of the even greater challenges experienced in smaller cities due to their different governmental and organizational scales. Currently, the existence of a large amount of data from administrative records and the computational capacity to process them seems to constitute a relevant opportunity to improve any targeting policy that requires accurate household classification.

Two other elements identified from Colombia's experience are essential. First, due to the interplay between the political perspectives and technical perspectives given that Law 142 has a countrywide reach, cities do not have the autonomy to modify this law. Only after reaching substantial experience from the Constitutional Court ruling in favor of other options to operationalize the concept of payment capacity did the central government take the initiative to discuss ways to improve the current stratification system. From an academic viewpoint, we encourage further discussion on stratification to consider its central role as a policy tool and not just as a technical statistical instrument (Alzate, 2006).

Second, the credibility of stratification has caused local governments to use stratum categories to target social spending in other policy fields, such as housing, education, and health. As stratum categories do not accurately reflect the population payment capacity, the subsidy system magnifies errors and regressivity, likely increasing inequality. To date, no study has tried to quantify the overall cost of this mismatch. Thus, stratification surpasses the scope of its intention and affects the collective idea of social group formation and its interactions (Uribe-Mallarino, 2008).

CRedit authorship contribution statement

Mauricio Quiñones: Conceptualization, Methodology, Data curation, Writing- Original draft preparation.

Lina M. Martínez: Writing- Reviewing and Editing

Juan C. Duque: Writing- Reviewing and Editing

Oscar Mejía: Reviewing

Declaration of competing interest

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